ORAL AND POSTER PRESENTATIONS

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ORAL AND POSTER PRESENTATIONS

ORAL PRESENTATIONS

Oral presentations will be held at the Michel PAYOT room of the Majestic Congress Center. Speakers have to deliver their slides or diskettes with Power Point presentations to the technician, who is in the Michel Payot room, at least two hours prior the lecture. All presentations will be stored on a unique computer.

POSTER PRESENTATIONS

Posters will be displayed throughout the symposium at the Isabella Straton and Théodore Bourrit rooms. Posters should be hung between 14 h and 19 h on 26th June. They should be removed between 13 h and 14 h on 28th June. The numbers on the posterboards correspond with the abstract numbers in the book of abstracts. Materials for hanging the poster will be provided on site.

MICROBIOLOGY

POSTER N° 1

INFLUENCE OF FIMA ON FIBRINOGEN BINDING IN *STREPTOCOCCUS GALLOLYTICUS*

Dargere S, Entenza JM, Verdon R, Piu S, Huet C, Leclercq R, Moreillon P
Infectious Diseases Unit, Centre Hospitalier Universitaire, Caen, France.

BACKGROUND

Virulence factors of *S. gallolyticus*, a major aetiological agent of infectious endocarditis (IE) in France, previously called *Streptococcus bovis* I, have not been studied. In particular, lipoprotein receptor antigens (LraI) associated with adhesion and virulence in IE, such as FimA from *Streptococcus parasanguis*, have never been described in *S. gallolyticus*.

AIM OF THE STUDY

To identify a fimA-like gene in *S. gallolyticus* UCN25 isolated from endocarditis and to investigate the fibrinogen binding properties of the gene product.

METHODS

After alignment of amino-acid sequences of LraI proteins from streptococci, degenerated primers were designed from conserved regions and used to amplify a DNA fragment from *S. gallolyticus* UCN25 by PCR. Inverse PCR was then used to identify the entire fimA-like gene. The gene was cloned in pORI23, a shuttle vector, and introduced into *Lactococcus lactis* ssp *cremoris*, a bacterium which binds poorly fibrin. Expression of the FimA-like protein in *L. lactis* was tested by FACS analysis using a specific rabbit antiserum raised against a synthetic peptide QDHEYEPLPEDV, a highly conserved region of LraI. The adherence of bacteria to fibrinogen was tested in a quantitative microtiter assay.

RESULTS

The 960-bp fimA-like gene of *S. gallolyticus* UCN25 was sequenced and cloned. The deduced amino-acid sequence was 79 % identical to that of FimA. The expression of FimA in the lactococcus background was indicated both by an increased fluorescence of fimA-like containing lactococci by FACS analysis and the ability of the cells to bind solid-phase fibrinogen. The expression of FimA in lactococci resulted in an increased adherence to fibrinogen proportionally to the protein concentration.

CONCLUSION

These results show that the FimA-like protein of *S. gallolyticus* displayed adhesin properties and is likely to be a virulence factor in *S. gallolyticus* IE because of its capacity to bind fibrinogen. ■

POSTER N° 2

EVALUATION OF THE *ENTEROCOCCUS FAECALIS* LIPOPROTEIN (EFAA) IN THE SERODIAGNOSIS OF ENTEROCOCCAL ENDOCARDITIS

Lang S, Watkin RW, Lambert PA, Gutschik E, Littler WA, Elliott TSJ
Department of Pharmaceutical and Biological Sciences, Aston University, Birmingham, United Kingdom

Enterococci are currently the third most common cause of native valve infective endocarditis (IE), accounting for almost 20 % of cases. The diagnosis of this infection, which is based primarily on abnormal echocardiography and microbiological culture, can be problematic, particular when blood cultures remain sterile. Serodiagnostic techniques are independent of both imaging and bacterial culture results and could complement current diagnostic methods.

Using an enzyme-linked immunosorbent assay (ELISA) serum IgG levels to an *Enterococcus faecalis* lipoprotein (EfaA) were significantly elevated in 16 of 18 patients (diagnosed as Duke 'definite' or 'possible' for enterococcal IE) compared to 11 of 96 control sera from patients with Duke 'definite' or 'possible' IE caused by microorganisms other than enterococci (23 *Staphylococcus aureus* IE, 20 coagulase-negative staphylococcal IE, 35 viridans streptococcal IE, 9 'other organisms' IE, and 9 culture-negative infections). The ELISA assay had a sensitivity of 89 %, specificity of 89 %, and positive and negative predictive values of 59 % and 98 % respectively. The likelihood ratio of a positive test was 8.1, for a negative test it was 8.1 and the accuracy was 89 %.

The ELISA assay, which is rapid, inexpensive and requires only a single clotted blood sample, was diagnostic of enterococcal IE. When used in parallel with other specific bacterial antigen ELISAs (including *Staphylococcus aureus* and viridans streptococci antigens) this assay may complement the Duke criteria in the diagnosis of IE. ■

POSTER N° 3

THE POTENTIAL ROLE OF PCR IN THE DIAGNOSIS OF INFECTIVE ENDOCARDITIS

Lang S, Watkin RW, Lambert PA, Littler WA, Elliott TSJ

Department of Pharmaceutical and Biological Sciences, Aston University, Birmingham, United Kingdom

The diagnosis of infective endocarditis (IE) is based on the fulfilment of the Duke criteria, principally positive blood cultures and abnormal echocardiography. Without a definitive aetiological diagnosis directed antimicrobial therapy cannot be instigated.

A broad-range polymerase chain reaction (PCR) technique was used to directly amplify prokaryotic DNA present within homogenised heart valve tissue from 98 patients undergoing valve replacements : 61 with no known valve infection and 37 with a preoperative diagnosis of IE ; 28 with a "definite" diagnosis and nine "possible" IE patients as defined by the Duke criteria. DNA sequencing of the PCR amplicon and database analysis allowed identification of the infecting microorganism.

PCR analysis confirmed 13 out of 18 (72 %) positive-blood culture results for "definite" patients that had undergone surgery before the completion of standard antimicrobial therapy and identified the infecting microrganism for one culture-negative patient. Of the remaining nine "definite" patients, who underwent surgery several months or years after treatment, bacterial DNA was shown to have persisted within the valve tissue of three patients. For the "possible" IE group, evidence was provided for the conversion of two out of nine patients (22 %) to the definite category and for four out of nine patients (44 %) to be re-categorised as IE "rejected". All tissues from patients with non-infective valvular insufficiency were either PCR-negative (51 out of 61, 84 %) or PCR inhibited (10 out of 61, 16 %).

Diagnosis of IE using PCR amplification and subsequent identification of 16S rRNA genes present within excised tissue is independent of specific bacterial growth requirements and is not affected by prior antimicrobial therapy. As such this technique may be particularly useful for cases where the diagnosis is unclear due to negative or inconclusive blood cultures. It is suggested that PCR be considered for inclusion in the Duke criteria. ■

POSTER N° 4

COOPERATION BETWEEN THE FIBRINOGEN (FG) AND FIBRONECTIN (FN) BINDING DOMAINS OF *STAPHYLOCOCCUS AUREUS* FNBPA FOR INFECTION IN EXPERIMENTAL ENDOCARDITIS

Piroth L, Que YA, Piu S, Entenza JM, Moreillon P

Laboratory of Infectious Diseases, CHUV, Lausanne, Switzerland

BACKGROUND

Expression of the *S. aureus* fibronectin-binding protein A (FnBPA) in *Lactococcus lactis* indicated that FnBPA was sufficient for infectivity in experimental endocarditis. FnBPA is an adhesin composed of a N-terminal (A) suspected to bind Fg, three Fn-binding (B,C,D) domain and a C-terminal wall-anchoring (LPXTG) domain.

AIM OF THE STUDY

To test he pathogenic role of these domains in vitro and in vivo.

METHODS

The fnbA gene from *S. aureus* 8325-4 was used as a template. Truncated genes containing various domains bracketed by the 5' ribosome-binding site and leader sequence, and the 3' LPXTG domain were generated by a PCR-ligation technique. These genes were subcloned in the lactococcal expression vector pOri23, and electroporated into *L. lactis*. Recombinants were tested for adherence to Fg and Fn, and for their ability to infect rats with aortic experimental endocarditis.

RESULTS

Domains and phenotypes of *L. lactis*

Assay	No protein	LPXTG alone	D-C	B	A	Whole FnBPA
Fg-binding	-	-	-	ND	+	+
Fn-binding	-	-	+	ND	+	+
*Exp. Endoc	$> 10^8$	$> 10^8$	$> 10^8$	ND	10^7	10^5

*Minimum inoculum infecting ≥ 80% of vegetations 24 h after bacterial challenge. ND = not done.

CONCLUSION

In vitro adherence tests confirmed the existence of several individual binding domains mediating attachment to Fg (A) and/or Fn (A,B,C,D). In vivo, the double Fg/Fb binding domain A was necessary and sufficient to induce experimental endocarditis.

POSTER N° 5

DNA SEQUENCE-BASED BACTERIAL IDENTIFICATION IN RESECTED VALVES FOR THE COMPARATIVE DIAGNOSIS OF BACTERIAL ENDOCARDITIS DURING A TWENTY ONE-MONTH SURVEY

Podglajen I, Bellery F, Poyart C, Coudol P, Buu-Hoï A, Bruneval P, Mainardi JL
Laboratory of Clinical Microbiology, Hôpital Européen Georges Pompidou, Paris, France

BACKGROUND
Microbiological diagnosis of endocarditis is mainly based on blood cultures but despite the improvement in conventional bacteriological techniques, the diagnosis of blood culture-negative endocarditis and in some cases, the precise identification of responsible bacteria remain a challenge.

AIM OF THE STUDY
To compare the molecular-based identification, directly from resected valves, of bacteria responsible for endocarditis with those obtained with conventional methods applied to bacteria isolated from blood cultures.

METHODS
This study concerns all patients operated on for endocarditis in a Parisian hospital from October 2000 to June 2002. PCR amplification and sequencing of 16S rDNA, and of $sodA_{int}$ and $rpoB_{int}$ in some cases, were applied to DNA from heart valves of 46 patients, 36 with definite and 10 with possible endocarditis.

RESULTS
Among the 36 definite cases, blood-cultures were positive in 30 and negative in 6. Among the 30 positive cases, PCR and partial sequencing of 16S rDNA allowed the identification of species (18) or genus (8) or neither (4) ; $sodA_{int}$ and $rpoB_{int}$ sequencing was necessary for species identification in 8 cases. Species identifications were identical in only 61.5 % when conventional techniques and DNA sequencing were used. In 5 out of the 6 cases of blood culture-negative endocarditis, sequencing allowed identification of the causative agent (3 *Bartonella quintana*, 1 *Bartonella henselae*, and 1 *Streptococcus gallolyticus*). In all 10 possible cases, PCRs were negative, consistent with the histological results which failed to reveal features suggestive of endocarditis.

CONCLUSION
Our results demonstrate a clear diagnostic benefit from direct molecular biological species identification, particularly in cases of blood culture-negative endocarditis and in cases of possible endocarditis, to confirm or invalidate the diagnosis. Moreover, in 19.4 % of the definite cases, the improvement in species identification by sequencing lead to an improvement in patient management. ■

POSTER N° 6

REGIONAL VARIATIONS OF *STREPTOCOCCUS BOVIS* INFECTIVE ENDOCARDITIS (SBIE) EVALUATED WITHIN THE INTERNATIONAL COLLABORATION ON ENDOCARDITIS (ICE) PROSPECTIVE COHORT STUDY (ICE-PCS)

Chirouze C, Bernard Y, Cabell C, Chen A, Corey GR, Olaison L, Plésiat P, Bradley S, Duval X, Doco-Lecompte T, Moreillon P, Murdoch D, Utili R, Habib G, Woods C, and Hoen B, on behalf of the ICE investigators
Hôpital Saint-Jacques, Besançon, France

BACKGROUND
The incidence of SbIE increased constantly in recent years in France. This phenomenon is not well understood and has not been observed in other countries.

AIM OF THE STUDY
To analyze regional variation of SbIE utilizing ICE-PCS.

METHODS
ICE-PCS began enrollment 1 January 2000. A standard case report form was used by all participating centers (34 centers in 15 countries) to report all their consecutive cases of IE to the central database at the ICE coordinating center. Through 15 Nov 2002, 1024 cases of definite IE were enrolled. Of these, 62 cases were SbIE ; they were compared to the 168 cases of viridans streptococcal IE (vsIE).

RESULTS
than vsIE (63.0 vs. 53.1 yrs, p=0.0008) ; 2) they less often had a previous history of IE (4.8 % vs. 13.1 %, p=0.07) or a previously known valve disease (32.3 % vs. 57.7 %, p=0.0006) ; and 3) they more often had a new murmur (50.0 % vs. 29.8 %, p=0.01), an echocardiographically-demonstrated valve vegetation (90.8 % vs. 80.4 %, p=0.07), and an overt systemic embolic accident (26.4 % vs. 10.7 %, p=0.006). Neither surgery rates (35.5 % vs. 39.3 %, p=0.6) nor in-hospital mortality rates were significantly different (12.9 % vs. 8.9 %, p=0.37). SbIE was found predominantly in two regions : Northern Europe (43.5 %), and Southern Europe (29.0 %). The distribution of cases in other regions were as follows : North America 6.5 %, South America 8.1 %, Australia 6.5 %, and Middle-East 6.5 %. Moreover the geographic distribution of SbIE significantly differed from that of vsIE (p=0.002).

CONCLUSION
This study confirms that SbIE is not equally distributed throu-

POSTER N° 7

SHORT-TERM PROGNOSIS OF INFECTIVE ENDOCARDITIS DUE TO *STAPHYLOCOCCUS AUREUS* IN A ONE-YEAR FRENCH PROSPECTIVE COHORT

Delahaye F, Alla F, Selton-Suty C, Béguinot I, Vandenesch F, Étienne J, Leport C, Hoen B
on behalf of the AEPEI study group
Hôpital Louis Pradel, Lyon, France

OBJECTIVE

To study the short-term prognosis of infective endocarditis (IE) due to *Staphylococcus aureus* (SA) in a large unselected cohort.

METHODS

We collected data on all patients hospitalized for IE during year 1999 in several French regions. Only definite IE according to the Duke criteria were included (559 cases).

RESULTS

120/559 IE were due to SA. In univariate analysis, the following relationships were statistically significant : SA-IE was more frequent in younger patients, probably because IV drug use was more frequent in the young. It was more frequent in insulin-dependent diabetic patients, in patients with a history of cerebrovascular accident, of chronic renal failure, of hepatic disease, of auto-immune disease. Patients with SA-IE had more often no previously known heart disease. In SA-IE, the Glasgow score was lower, septic shock occurred more often, as fever, vascular phenomena, purpura, glomerulonephritis, meningitis, pulmonary embolism, blood creatinine level > 180 µmol/l, white blood count > 10,000, C-reactive protein > 120 mg/l. In SA-IE, the tricuspid valve was more often involved, whereas aortic valve was less often involved. There was more often no or only one valve injured by IE. Vegetations were more frequent whereas abscesses were less frequent. Patients with SA-IE were operated less often (31 % vs 52 %), they died more often (27 % vs 14 %). In multivariate analysis, SA remained a significant factor of a lower surgery rate (odds ratio : 0.48). SA did not influence the lethality rate. The significant predictors were insulin-dependent diabetes (7.09), history of heart failure (2.36), history of immunodepression (3.33), alcoholism (21.41), need for diuretic treatment (2.42), septic shock (4.38), low Glasgow score (3.95), cerebral hemorrhage (9.11) and high C-reactive protein (2.78).

CONCLUSION

Our analysis shows that SA-IE is much less operated on during the initial hospital stay than IE due to other microorganisms, even when other variables are taken into account by a multivariate analysis. SA did not remain a significant factor of in-hospital lethality in multivariate analysis. These two findings are surprising, and we do not have clear explanations. ■

POSTER N° 8

ACUTE ACALCULOUS CHOLECYSTITIS, A CONSTANT FINDING IN *PSEUDOMONAS AERUGINOSA* EXPERIMENTAL ENDOCARDITIS IN RABBITS

Fanourgiakis P, Argyrakos T, Hatzianastasiou S, Samarkos M, Tsaousis G,
Kontopoulou T, Vaidakis E, Rontogianni D, Saroglou G
5th Dept of Medicine, Evangelismos Hospital, Athens, Greece

BACKGROUND

Acute acalculous cholecystitis (AAC) accounts for 5-10 % of cases of acute cholecystitis, and it is usually found in debilitated patients with serious trauma, burns, major surgical operations, shock, diabetes, malignancy, sepsis, malnutrition and prolonged parenteral hyperalimentation. Predisposing factors are ischemia, cholecystoparesis, stasis and direct infections of the gallbladder bile. AAC can be complicated by perforation of the gallbladder.

AIM OF THE STUDY

To estimate the frequency of AAC during the course of *P. aeruginosa* endocarditis (PAE), in a rabbit experimental endocarditis model (EM).

METHODS

17 surviving rabbits with left sided PAE were sacrificed on day 8. They were treated with ceftazidime and tobramycin. Gallbladders were removed and sent to the pathology laboratory. Specimens were formalin fixed and stained with haematoxylin and eosin. All the excised gallbladders were cultured.

RESULTS

Macroscopically all cases showed violaceous to green-black discoloration and thinning out of the gallbladder wall. There was a fibrin layer on the mucosa and in one case we found a suppurative exudate. 7/17 (41 %) of the gallbladders showed focal and 10/17 extensive necrosis of ischemic coagulative type, confined to the mucosa or extending across the gallbladder wall. In 4/17 (23 %) cases we observed inflammation composed by lymphocytes and polymorphonuclear leukocytes. All findings were suggestive of AAC of various degrees of severity. Only one culture (of the bladder with suppurative exudate) was positive for PA.

CONCLUSIONS

Histopathological findings of AAC are constant in a EM of PAE. Although reports of AAC in humans with severe Pseudomonas infections are lacking, searching for clinical and imaging findings of this entity, in such patients could be useful, as gangrene and perforation may occur in spite of minimal clinical signs. ■

POSTER N° 9

STAPHYLOCOCCUS AUREUS INFECTIVE ENDOCARDITIS (IE) : ANALYSIS OF 38 PROSPECTIVELY IDENTIFIED CASES

Finkelstein R, Oren I, Agmon Y, Reissner S
Rambam Medical Center, Haifa, Israel

S. aureus IE remains a potentially lethal disease. During the past 7 years, 144 consecutive patients with IE diagnosed by the Duke criteria were prospectively evaluated at our institution. Of this, 49 (32.8 %) were due to *S. aureus*. In the present study we characterize 38 consecutive patients with definite IE due to S. aureus diagnosed during this period. The mean age of these patients was 58.1±20.2 and the male : female ratio was 1:1. Two major clinical criteria were identified in 28 cases (73.6 %) and pathological criteria in 11 (29 %). TTE was performed in 36 cases and revealed evidence of IE in 30 (83.3 %). Atypical findings were seen in two additional patients (5.5 %). The mitral valve was the most commonly involved site of infection (18 patients, 47.3 %). Among commonly recognized risk factors for IE, intravenous drug use was the most frequent (8 patients, 21 %). Risk factors were unknown in 12 patients (31.5 %). Identifiable risk factors were found in 16 of 20 patients (75 %) with community-acquired (CA) IE as compared to 3 of 10 patients (30 %) with hospital-acquired infection (HAI) (p=0.01). Eight additional patients (21 %) with CA bacteremia were considered to have "healthcare-related" (HCR) infection, including 4 patients with "late" prosthetic valve IE. Ten cases (26.3 %) were due to MRSA, all of them being HAI (7 patients) or HCR (3 patients). Severe complications, particularly a major embolic event (10 cases, 26.3 %), heart failure (8 cases, 21 %) and sepsis and/or metastatic infections (8 cases, 21 %) were common. Surgery was performed in 10 patients (26.3 %). The overall mortality was 47.3 %, as compared to a mortality rate of 14.5 % among 69 patients with definite IE from other causes (p<0.001). *S. aureus* has emerged as the leading cause of IE and the epidemiological spectrum of this disease is continuously changing. ■

POSTER N° 10

INFECTIVE ENDOCARDITIS DUE TO *PROPIONIBACTERIUM ACNES*

Fol S, Delahaye F, Célard M, Gauduchon V, Beaune J, vandenesch F, de Gevigney G
Hôpital Louis Pradel, Lyon, France

BACKGROUND

Propionibacterium acnes is a Gram-positive, anaerobic rod, which is a skin commensal. Too often it is considered as a contaminant of biologic specimens, especially blood cultures. Its involvement in several diseases is well known : cerebral abscesses, eye infections, osteitis, acne. It is also responsible for infective endocarditis.

OBJECTIVE

To report on 11 cases gathered in one single institution and to compare them to the rare cases reported in the literature.

METHODS

Descriptive retrospective study of 11 patients hospitalized between 1993 and 2001 in the Hôpital Louis Pradel, Lyon, France. Review of the literature.

RESULTS

IE due to *P. acnes* is rare, but its frequency is probably underestimated. The portal of entry, probably cutaneous, is exceptionally proven (the portal of entry was suspected in 7/11 case, and proven in 0). The disease is severe : frequent occurrence in patients with valve prosthesis (4/11), frequent embolic episodes (4/11), very high surgery rate (10/11), high lethality rate (3/11). Non suggestive symptoms and the slow growth of *P. acnes* make the diagnosis difficult ; it is made at a very late stage of the disease, and valvular lesions are very destructive. In spite of a good susceptibility of *P. acnes* to antibiotics, surgery is often needed. PCR increases the sensitivity and the speed of its diagnosis. Blood cultures were positive in 9/11 cases, delay of growth was 5-15 days. At echocardiography, there were vegetations in 6 cases, abscess in 5, new regurgitation in 3, and prosthesis dehiscence in 4 of the 4 patients with valve prosthesis. ■

PREVALENCE OF BIOTYPE I AND ANTIBIOTIC RESISTANCE PHENOTYPE IN 27 CASES OF *STREPTOCOCCUS BOVIS* ENDOCARDITIS. CORRELATION WITH DETECTION OF BIOTYPE I SPECIFIC GENES (CL51, DS14) AND ANTIBIOTIC RESISTANCE GENES (TETM, ERMB)

Fosse T, Bernard E, Chretien R, Lalouze F, Farhad R, Dellamonica P

Bacteriology, Nice University Hospital, France

OBJECTIVES

The aim of this study on *S. bovis* endocarditis was (1) to determine the prevalence of biotype I (2) to define antibiotic resistance phenotypes in particular with tetM and ermB gene detection (3) to verify the specificity of cl51 and DS14 gene positivity for biotype I strains recently proposed.

METHODS

A retrospective study over a 6 year period (1997-2002) of *S. bovis* bacteremia (71 cases) and among them confirmed endocarditis (27, 38.2 %) in Nice university hospital. Antibiotic susceptibility to penicillin, tetracycline (tet), erythromycin (ery), clindamycin, streptomycin (str) and kanamycin (kan) was studied by Etest MIC method. The biotypes I, II1 and II2 were determined by classical biochemical tests and identification was confirmed in doubtful cases by ARNr 16s sequencing. The tetM, ermB, cl51 and DS14 genes were detected by PCR.

RESULTS

27 patients (19 male, 8 female) with a mean age of 66.4 years were included. A digestive portal of entry was found in 55.5 % of cases. Outcome was unfavorable in 2 cases. A high prevalence of biotype I (23, 85.2 %) was found. Other biotypes were II1 (2, 7.4 %) and II2 (2, 7.4 %). Conversely biotype II was predominant in bacteremia without known endocarditis (32, 72.7 %). The main rates of resistance were : tetracycline (22, 81.5 %, tetM positive), erythromycin + clindamycin (18, 66.6 %, ermB positive) and streptomycin + kanamycin (10, 37 %). Main phenotype were tetReryR and tetReryRstrRkanR suggesting horizontal transmission of Tn916 like mobile genetic elements. The cl51 and DS14 gene were found in all biotype I strains but not in other biotypes. The role of biotype I and its specific genes in endocarditis pathogenesis deserves further studies. ■

POSTER N° 12

STAPHYLOCOCCUS AUREUS ENDOCARDITIS THROUGHOUT THE WORLD : A PRODUCT OF MEDICAL PROGRESS. REPORT FROM THE ICE INVESTIGATORS

Fowler VG, Miro JM, Spelman D, Cabell CH, Corey GR, Hoen B, Abrutyn E, Chen A, Bradley S, van der Meer JTM, Elliott T, Jones P, Levine D, Athan E, Marco F, Bayer AS

Duke University School of Medicine and the Duke Clinical Research Institute, Durham, USA

BACKGROUND

Staphylococcus aureus infective endocarditis (SAIE) is an incompletely understood infection of global significance.

AIM OF THE STUDY

To describe the characteristics, treatment, and outcome of patients with SAIE using data collected within the International Collaboration on Endocarditis (ICE) Prospective Cohort Study (ICE-PCS).

METHODS

From January 2000 through November 2002, 922 cases of definite IE with an established microbiologic diagnosis were enrolled by 34 ICE-PCS centers in 15 countries using a standard case report form.

RESULTS

S. aureus was the most common cause of IE in the study (n = 329 patients ; 35.7 %). Compared with non SAIE patients, SAIE patients were younger (54.1yr vs. 57.4, P= 0.0056), more frequently female (41.3 % vs. 29.3 %, P = 0.002), hemodialysis dependent (17.9 % vs. 6.9 %, P = <0.0001) diabetic (20.7% vs. 15.3%, P = 0.035), or injection drug users (22.7 % vs. 5.2 %, P < 0.0001). Patients with SAIE were more likely to have undergone invasive procedures (24.3 % vs. 15.5%, P = 0.0018), have an intravascular device present as the presumed source (chronic central catheter [14.9 % vs. 4.1 %, P < 0.0001], short-term central catheter [8.2 % vs. 3.1 %, P = 0.0006], simple IV [13.2 % vs. 4.1 %, P < 0.0001]) ; or have healthcare associated (HA = nosocomial or nosohusial) IE (46.0 % vs. 20.1 % ; overall P < 0.0001). Rates of HA SAIE were significant throughout the world (North America [NA] 56.7 %, South America [SA] 47 %, Australia/New Zealand [A/NZ] 33.4 %, and Europe/ Middle East [E/ME] 38.3 % ; overall P < 0.0001). Geographic rates of vancomycin therapy varied significantly (NA 57.6 %, SA 41.2 %, A/NZ 20.4 %, E/ME 26.4 % ; P < 0.0001), although geographic rates of MRSA were similar (NA 37.3 %, SA 35.3 %, A/NZ 16.3 %, E/ME 28.9 % ; P = 0.13). Geographic rates of surgery, stroke, and death did not differ significantly.

CONCLUSION

In this multicenter, international, prospective study, *S. aureus* was the most common cause of IE, and was HA in almost half of all cases. Healthcare contact represents an important risk for SAIE throughout the world. ■

CLINICAL AND MORPHOLOGICAL CHARACTERISTICS OF INFECTIVE ENDOCARDITIS DUE TO *STREPTOCOCCUS BOVIS* IN A SERIES OF NON-ADDICT PATIENTS

Gonzalez-Juanatey C, Gonzalez-Gay MA, Testa A, Garcia-Castelo A, Vidan J

Cardiology Department, Hospital Xeral-Calde, Lugo, Spain

Background

Streptococus bovis (*S. bovis*) is a frequent causal germ of Infectious endocarditis (EI). Controversy exists about the actual frequency of S. bovis IE, the incidence of malignancy and outcome.

Aim of the study

To compare clinical features and mortality of non-drug-addict patients with *S. bovis* IE and the rest of non-drug-addict patients with IE.

Methods

Review of patients with *S. bovis* IE diagnosed with clinically definite IE according to the Duke classification criteria at the single reference hospital over a 13-year period.

Results

Between 1987 and 2000, 108 consecutive non-addicts patients had 119 episodes of clinically definite IE. Twenty consecutive patients were diagnosed with *S. bovis* IE (17 % of the cases of definite IE). Sixteen patients (94 %) were men. The mean age was 57±17 years. IE involved native valves in all cases. The absence of underlying heart disease ($p < 0.01$), simultaneous involvement of two cardiac valves ($p < 0.008$) and moderate-severe valvular regurgitation ($p < 0.02$) were more common in patients with *S. bovis* IE. Patients with *S. bovis* IE had a significantly higher delay to diagnosis ($p < 0.005$). However, in-hospital mortality rate and need for in-hospital valvular surgery did not show differences between patients with IE due to *S. bovis* and the rest of non-drug-addict patients with IE. Colonic neoplasms were observed in 77 % of patients : adenomatous polyps in 8 cases and colon adenocarcinoma in other 2. No differences in mortality and need for valvular surgery during follow-up occurred between patients with *S. bovis* IE and the rest. However an early requirement of valve replacement during follow-up in *S. bovis* IE was observed.

Conclusion

In unselected patients, despite the more common involvement of multiple valves, and the frequent occurrence of haemodynamically relevant valvular regurgitation, *S. bovis* IE has a similar rate of mortality to that observed in IE due to other microorganisms. However, a colonoscopy evaluation during the admission and follow-up is required. ■

Poster n° 14

CULTURE AND HISTOPATHOLOGICAL EXAMINATION OF CARDIAC VALVES FROM ENDOCARDITIS PATIENTS : UTILITY OF VALVE SONICATION IN INCREASING CULTURE SENSITIVITY AND THEIR ROLE FOR THERAPY

Ragone E, Tripodi MF, Fortunato R, Casillo R, Barra E, Forte G, Romano GP, Carozza A, De Santo L, De Feo M, Cotrufo M, Utili R

Unit of Infectious & Transplant Medicine, Second University of Naples, Monaldi Hospital, Naples, Italy

Background

Culture and histopathological examination (CHE) of cardiac valves of patients with endocarditis are useful to confirm diagnosis. The occurrence of false-positive or negative cultures may be a confounding factor.

Aim

To assess the usefulness of ultrasound treatment of valve tissues in increasing the sensitivity of cultures 2) the role of CHE in establishing the efficacy of pre- and post-surgical antibiotic therapy.

Methods

Prospective CHE study of valves of patients with definite or possible endocarditis from 1/2002 to 1/2003. Valves were split in three pieces, 2 were sent to the microlab, in nutrient broth, where one of the samples was pre-treated with ultrasound disintegration (45 sec at 21 Kcicles/sec.) that disgregate tissue without affecting bacterial viability.

Results

42 valves were removed from 41 patients (M/F, 33/9 ; median age 48, range 19-77 years) ; early surgery was performed in 21. Preoperative blood-cultures were positive in 29 patients (Streptococci 12, Staphylococci 12, Enterococci 3, others 2). Valve-cultures were positive in 11 cases (11 sonicated and 8 non-sonicated ; 90 % early surgery). Both valve and blood-culture were positive for the same strain in 7 out 8 cases (1 false-positive), while in three, valves were positive and blood-cultures negative. In 21 cases valve-cultures were negative and blood-culture positive (29 % were treated for ≤ 15 days). Furthermore in 10 cases both blood- and valve-cultures were negative (90 % treated for ≤ 15 days) ; of these cases CHE rejected diagnosis in 4. There was a good agreement among valve-culture, histopathological infiltrate and gram-stain and disease activity. Five patients died (12 %) ; 4 had positive valve-culture. In patients with positive valve-culture who survived a prolonged post-surgery antibiotic therapy allowed cure.

Conclusions

Valve sonication increases the sensitivity of culture. CHE studies are necessary to decide the length of post-surgical treatment and may allow a re-evaluation of standard treatment protocols. ■

PERSISTENT *STAPHYLOCOCCUS AUREUS* BACTEREMIA

Siegman-Igra Y, Reich P, Schwartz D, Giladi M

Tel Aviv Sourasky Medical Center and Sackler School of Medicine, Tel Aviv University, Israel

Although *S. aureus* bacteremia (SAB) has received very much attention for decades there is limited information on the clinical circumstances associated with persistence of SAB in spite of appropriate antimicrobial therapy. The purpose of this study was to characterize the patients with persistent SAB. Among 4597 episodes of SAB in adults during 4 years (1997-2000), positive blood cultures persisted for more than 72 hours (3-36 days) while on appropriate anti-staphylococcal therapy in 35 patients, 26 (74 %) of whom had methicillin resistant *S. aureus* (MRSA) bacteremia. Persistence of SAB occurred on vancomycin therapy in 33 (94 %) episodes. The suspected or documented port of entry of the micro-organism was intravenous line in 28 cases (central in 22, peripheral in 5, and tunneled in 1), illicit drug injection in 4, surgical site infection in 2, and respiratory tract in 1. The most common risk factors for acquisition and/or persistence of SAB were recent trauma, surgery or ICU type of care in 15 patients, hemodialysis in 8, and valvular heart disease in 5 (4 of whom had prosthetic valve). The presumed site of persistence of infection was endocarditis in 14, other endovascular infection in 7, pneumonia or empyema in 7, osteomyelitis in 4, and unknown in 3. In-hospital mortality was 57 % (20 patients). 16 patients died without clearing the bacteremia that persisted for 3 to 29 days of start of therapy. Persistent SAB is a serious complication with a high mortality rate. It occurs almost exclusively while on vancomycin therapy and usually develops secondary to an intravenous line infection. The most common site of persistence is endocarditis, but other sites should be carefully looked for. ■

POSTER N° 16

UNUSUALLY HIGH RATE OF HEPATIC COMORBIDITY WITH *STREPTOCOCCUS BOVIS* ENDOCARDITIS : TREND OR COINCIDENCE ?

Tripodi MF, Adinolfi LE, Ragone E, Durante Mangoni E, Fortunato R, Iarussi D, Ruggiero G, Utili R

Department of Internal Medicine, Unit of Infectious & Transplant Medicine, Unit of Cardiology, 2nd University of Naples, Italy

BACKGROUND

Infective endocarditis (IE) due to *Streptococcus bovis* 1 (*S. bovis*) has been correlated to colonic lesions and, sporadically, to liver diseases.

AIM

To evaluate the clinical and epidemiological features of *Streptococcus bovis* endocarditis.

METHODS

Prospective evaluation of risk factors and clinical features of patients with *S. bovis* endocarditis. *S. bovis* were identified by conventional methods and MIC/MBC were performed.

RESULTS

179 patients with definite IE have been prospectively evaluated since 1990. Twenty-two patients (12 %) had *S. bovis* IE (*S. bovis* I, 20 ; *S. bovis* II, 2), 17 males and 5 females. Twenty cases occurred on native valve (aortic and mitralic, 9 ; aortic, 6 ; aortic and tricuspid, 1 ; mitral, 3 ; tricuspid, 1) and 2 on aortic prosthetic valve. Compared to patients with IE due to other pathogens, these patients were older (mean years : 56.1 ± 12.9 vs. 47.2 ± 17.5 ; $p = 0.023$), had higher rate of bivalvular involvement (45% vs. 8% ; $p < 0.001$) and embolic events (73 % vs. 37 % ; $p = 0.009$). Spine involvement was frequent in patients with *S. bovis* I endocarditis (25 % vs 0.6 % in other IE, $p < 0.001$). In patients with *S. bovis* I endocarditis colonic adenoma was present in 9 (47 %) and advanced liver disease in 12 (60 % vs. 12 % in other IE $p < 0.001$). Valve replacement was necessary for 8 patients. The mortality rate (14 %). The interval between onset of symptoms and diagnosis was 55 days (range 10-90) for patient cured by medical therapy and 121 (range 60-240) for those who required surgery. All strains were susceptible to penicillin but showed a high rate of streptomycin resistance and reduced susceptibility to macrolides and tetracyclines.

CONCLUSION

Besides the association with colonic disease, *S. bovis* endocarditis was highly correlated with severe liver diseases. Studies on a larger population are needed to further support this finding. ■

INFECTIVE ENDOCARDITIS CAUSED BY CANDIDA IN TWO INTRAVENOUS DRUG USERS

Westling K, Julander I, Thalme A

Dept of Infectious Diseases, Huddinge University Hospital, Stockholm, Sweden

Endocarditis caused by Candida species is rare. One of the predisposing factors is drug abuse. We report two cases from Stockholm, Sweden.

Case 1

A 36-year old man addicted to intravenous amphetamine was hospitalized due to fever, dyspnoea and chest pain. On admission the patient had 37.3° and a systolic murmur was recorded. Staphylococcal endocarditis was suspected and treatment with cefuroxime was started. Two vegetations were seen on the aortic valve and there was a regurgitation of the valve at transthoracic echocardiography. Twenty-four hours following admission the patients suddenly died. *Candida parapsilosis* was grown from blood cultures. During autopsy, grainy, yellow masses were found on the aortic valve.

Case 2

A 47-year old female intravenous amphetamine user had previously been treated for *Staphylococcus aureus* tricuspid valve endocarditis. Her symptoms were fever and cough. *Candida albicans* was isolated from blood cultures. Vegetations on the tricuspid valve were identified by transesophageal echocardiography. Treatment with fluconazole 800 mg once daily was planned for two years. The antimycotic treatment continued for 8 months and then the patient stopped treatment because of side effects. At follow-up 6 months later the blood cultures were sterile and C-reactive protein was normalized. ■

POSTER N° 18

ABIOTROPHIA DEFECTIVA : MULTIPLE DISCITIS AND SACROILIITIS IN A PATIENT WITH MITRAL VALVULOPATHY

Wilhelm N, Sire S, Le Coustumier A, Beldjerd M, Loubinoux J, Billey T, Lassoued S, Grasmick C, Bouvet A

Laboratoire, Centre hospitalier, Cahors, France

Abiotrophia defectiva, formerly included in nutritionally variant streptococci because of its fastidious growth in vitro, is a predominant member of the buccal flora. It is a rare cause of bacterial endocarditis. It may be responsible for culture negative endocarditis because of special nutriments requirement.

We report the first case of a echocardiographically negative probable endocarditis revealed by sacroiliitis and multiple discitis. An apyretic 51-year-old male with history of a stable grade III mitral valvulopathy was admitted because of acute lumbago with sciatica. One month before, four dental interventions were performed to treat apical necroses of teeth, with each time amoxicillin (3 g) antibioprophylaxy. Biological data showed first hour ESR at 52 mm, CRP at 200 mg/l but normal WBC. Imaging studies including scintigraphy bone scanning and magnetic resonance imaging showed multiple spondylitis with discitis (L2-L3 to L5-S1) and right sacroiliitis. Trans-thoracic and trans-oesophageal echocardiographies confirmed the known mitral defect but despite attentive examination they didn't show any sign of endocarditis.

Abiotrophia defectiva grew in all five sets of hemocultures : it was identified with bioMérieux Api 20 STREP® & rapid ID 32 STREP® using an heavy inoculum. The isolate showed a decreased susceptibility to ß-lactamins (MIC penicillin-G : 1.5 mg/l, amoxicillin and cefotaxim : 0.5 mg/l). Treatment was instituted during three weeks with parenteral amoxicillin 12 g/day, rifampicin per os 1800 mg/day and gentamicin 240 mg/once daily during the first five days, and relayed per os (amoxicillin 6g/day and rifampicin unchanged). After ten weeks and full recovery of the patient, the treatment was stopped.

Abiotrophia endocarditis is characterized by a slow and indolent course, often revealed by osteoarticular manifestations. Diagnosis is difficult because echocardiography and cultures remain often negative. Many strains exhibit decreased susceptibility to ß-lactamins. This case raises the problem of a probable endocarditis after dental surgery despite correct antibioprophylaxis. ■

POSTER N° 19

CENTRAL NERVOUS COMPLICATIONS OF INFECTIVE ENDOCARDITIS

Barsic B, Klinar I, Himbele J, Vranjican Z, Lepur D
University Hospital for Infectious Diseases, Zagreb, Croatia

BACKGROUND
Central nervous system (CNS) complications of infective endocarditis (IE) are more common than appreciated and risks factors are not clearly elucidated.

AIM OF THE STUDY
To determine risk factors for central nervous system complications in patients with infective endocarditis.

METHODS
Single center study of 100 patients with IE. Difference in the characteristics of the disease between group of patients with CNS complications and those without are evaluated in univariable analyses.

RESULTS
CNS complications were reported in 42 (42 %) of patients. Meningitis was the most common complication (37/42 patients, 84.6 %). Focal neurologic signs were present in 18 (42.3 %) patients, mostly hemiparesis (-plegia). Convulsions were present in 8 (19 %) of patients. Beside meningitis, cerebritis was present in 7, brain abscess in 9, mycotic aneurism in 3, subarachnoid haemorrhage in 3 and ischaemic cerebrovascular incident in 6 patients.
Patients with CNS complications had more acute presentation of the disease, more common multiorgan dysfunction syndrome, skin embolisations, *S. aureus* infection and mitral valve involvement. Mechanical ventilation was necessary in 52.4% of patients with CNS complications. Hospital mortality was 47.6 % in this group of patients compared to 8.6 % in patients without CNS involvement.

CONCLUSION
CNS complications are common in septic patients with IE and should be meticulously diagnosed since they have significant negative impact on patients outcome. ■

POSTER N° 20

NOSOCOMIAL AND NOSOHUSIAL NATIVE VALVE INFECTIVE ENDOCARDITIS : A REAPPRAISAL OF THE ETIOLOGY AND OUTCOME

Benito N, Miro JM, Abrutyn E, Cabell CH, Chen A, Sexton D, Stafford J, Anguera I, Dismukes W, Hasan S, Doco-Lecompte T, Rubinstein E, Patel M, Bradley S, Rupp M, Perez N, and the ICE Working Group
Hospital Clínic – IDIBAPS. University of Barcelona, Spain

BACKGROUND
There is evidence that nosocomial infective endocarditis (NIE) may be increasing. However, only small retrospective studies are available. Furthermore, nosohusial IE (NHIE) is not well described.

AIM OF THE STUDY
To describe the current characteristics and outcome of NIE and NHIE on native valves and to compare them with community-acquired IE (CAIE) using the International Collaboration on Endocarditis (ICE) Prospective Cohort Study (ICE-PCS).

METHODS
Duke definite native valve NIE and NHIE cases in the ICE-PCS were identified and compared with CAIE cases. The study, performed between January 2000 and November 2002, involved 34 centers in 15 countries. In this study the following definitions were used : NIE = hospital-acquired IE ; NHIE = non-hospital acquired health care related IE (e.g. outpatient hemodialysis, outpatient chemotherapy or home intravenous antibiotics). Parenteral drug use IE was excluded.

RESULTS
Five hundred twenty six cases were identified : 369 CAIE (70 %), 82 NHIE (16 %) and 75 NIE (14 %). Chronic hemodialysis (59 %) and receipt of chronic immunosuppressive therapy (24 %) were common in patients with NHIE. Previous invasive procedures were more frequents in NIE cases (51 %) than in NHIE (36 %) or CAIE cases (8 %) ($p < 0.0001$). *Staphylococcus aureus* was the leading cause of both NIE (54 %, MRSA = 69 %) and NHIE (56 %, MRSA = 57 %) IE, and the third leading cause of CAIE (17 %, MRSA = 11 %) ($p < .0001$). Mitral valve followed by aortic valve were the most frequently affected valves in all groups. A similar percentage of cases required surgical treatment in each group (40 % NIE, 37 % NHIE, and 46 % of CAIE cases) but in-hospital mortality differed markedly (NIE = 31 %, NHIE = 32 % and CAIE = 13 %) ($p < .001$).

CONCLUSIONS
Currently NIE and NHIE each compromise about 30 % of cases of native valve IE. In comparison with CAIE, NIE and NHIE have a distinctive epidemiological and etiological pattern with higher rates of mortality despite similar rates of surgery. ■

PROSTHETIC VALVE ENDOCARDITIS : REPORT OF 214 CASES FROM THE ICE PROSPECTIVE COHORT STUDY

Cabell CH, Corey GR, Hoen B, Miro JM, Chen A, Iarussi D, Selton-Suty C, Wang A, Athan E, Bruan S, Jones P, Lerakis S, Hasan S, Oyonarte M, Fowler VG, for the ICE Investigators

Duke University School of Medicine and Duke Clinical Research Institute, Durham, USA

Background

Prosthetic valve endocarditis (PVE) is an emerging but incompletely understood complication of medical progress.

Aim of the study

To determine the current clinical characteristics and outcome of patients with PVE utilizing the International Collaboration on Endocarditis (ICE) Prospective Cohort Study (ICE-PCS).

Methods

From January 2000 through November 2002, 1024 cases of definite IE were prospectively enrolled by 34 centers representing 15 countries using a standard case report form. Of these, 214 (20.8 %) had PVE.

Results

The median age of PVE patients was 59.5 years (IQR 47.0-73.0) ; 69.2 % were male. The interval from valve surgery to onset of PVE was < 60 days in 21 patients and > 365 days in 69 patients (median = 447.5 days, IQR 104 – 2329 days). The most common organisms were *Staphylococcus aureus* (25.8 %), coagulase negative staphylococci (18.3 %), and viridans group streptococci (11.7 %). PVE was demonstrated by echocardiography in 146 patients (92.4 %) : vegetations (70.6 %), abscess (32 %), dehiscence (15 %), and fistula (1 %). Surgery during the acute episode was common (52.3 %) with valve regurgitation (54.5 %) and abscess (42.0 %) the most frequent indications. Embolic events (stroke 13.5 %, other emboli 13.2 %), heart failure (31.2 %), intracardiac abscess (33.2 %), and death (23.8 %) were frequent complications of PVE.

Conclusion

In this large, multicenter, international cohort, *S. aureus* was the most common cause of PVE. Although over 50 % of patients went to surgery, mortality remained high. Further work is needed to evaluate the emerging importance of *S. aureus* as a cause of PVE, to identify risk factors for death, and to define the impact of early surgery on survival. ■

POSTER N° 22

CLINICAL FINDINGS, COMPLICATIONS, AND OUTCOMES IN A LARGE PROSPECTIVE STUDY OF DEFINITE ENDOCARDITIS : THE INTERNATIONAL COLLABORATION ON ENDOCARDITIS - PROSPECTIVE COHORT STUDY

Cabell CH, Barsic B, Bayer A, Hoen B, Olaison L, Fowler VG, Miro JM, Chen A, Stafford J, Gordon D, Peterson G, Spelman D, Selton-Suty C, Korman T, Abrutyn E, for the ICE Investigators

Duke University School of Medicine and Duke Clinical Research Institute, Durham, USA

Background

A large international, prospective study of patients with IE has not been done.

Aim of the study

To determine the clinical findings, complications, and outcomes in patients with IE utilizing the International Collaboration on Endocarditis (ICE) Prospective Cohort Study (ICE-PCS).

Methods

ICE-PCS began enrollment 1 January 2000. Through 15 November 2002, 1024 cases of definite IE were enrolled by 34 centers representing 15 countries. Each center utilized a standard case report form.

Results

The median age of the cohort was 57.0 years (IQR 43.0-71.0) and 67.3 % of the patients were male. The most common co-morbidities included dialysis dependence (10.0 %), diabetes (16.6 %), and IV drug use (10.8 %). Preceding dental procedures were less common (7.9 %) than other invasive procedures (18.7 %). Other risk factors for IE included : previous IE (12.0 %), congenital heart disease (13.1 %), and underlying valvular heart disease (36.0 %). The most common organisms were *Staphylococcus aureus* (32.4 %), viridans group streptococci (13.1 %), and *Enterococcus faecalis* (10.6 %). Vegetations were documented by echocardiography in 868 patients (84.9 %) Valve involvement was as follows : aortic (40.6 %), mitral (49.1 %), tricuspid (15.1 %), and pulmonic (1.3 %). Surgery during the acute episode was common (45.2 %) with regurgitation (67.0 %) and heart failure (41.3 %) the most frequent indications. Complications of IE were frequent : embolic events (stroke 16.7 %, other emboli 22.7 %), heart failure (31.3 %), intracardiac abscess (16.2 %), and death (19.4 %). In the univariate analyses the strongest predictors of death were : age, diabetes, hemodialysis, chronic indwelling intravenous catheters, stroke, heart failure, and intracardiac abscess ($p < 0.001$ for all). The causative microorganisms with the highest mortality were as follows : coagulase negative staphylococci (26.0%), *Staphylococcus aureus* (24.2 %) and Enterococci (21.1 %) ($p = 0.002$ for all).

Conclusion

Even in the modern era of antimicrobial therapy and sophisticated surgical techniques, patients with IE during the initial hospitalization remain at significant risk for both serious complications and death. ■

INFECTIVE ENDOCARDITIS IN CONGENITAL CARDIOVASCULAR DISEASES

Donova T, Matveev M

Internal Diseases Clinic, Medical University, Sofia, Bulgaria

The aim of the study is to analyse the clinical, instrumental and operational data in patients with congenital cardiovascular diseases (CVD), complicated with infective endocarditis. Of a total of 121 patients subjected to surgery for infective endocarditis, congenital CVD as a predisposing condition was found in 21 : 18 men (85.7 %) and 3 women (14.3 %), average age 35 years (18 to 57). In 8 patients (38.1 %) that was bicuspid aortic valve; in 5 (23.8 %) – VSD ; in 4 (19 %) aortic stenosis and insufficiency ; in 2 (9.5 %) - coarctation of the aorta ; in 1 (5 %) – PTA ; in 1 (5 %) - combined CVD : coarctation of the aorta and bicuspid aortic valve. The diagnosis of infectious endocarditis was verified within an interval of 15 to 240 days (65 on the average) after the onset of the clinical symptoms. The entry focus for the onset of the infection is known for only two patients : skin infection and pulmonary inflammation. In 14 of the patients (66.7 %) the infectious causative agent has been identified : Staphylococcus in 5 (23.8 %) ; Streptococcus in 3 (14.4 %), Rikettsia in 3 (14.3 %), Enterobacter in 1 (5 %), Chlamydia in 1 (5 %) and Corynebacterium in 1 (5 %). Vegetations of the aortic valve were found echocardiographically in 19 patients. Planned surgery was applied to 14 patients ; the remaining patients were subjected to surgical intervention, due to drug-uncontrolled congestive heart failure – in 7 patients, and in 2 also due to unaffected inflammatory process and embolic incidents. Aortic valve prosthesis was applied in 17 patients, in 3 – bivalvular, in 1 – tricuspid prosthesis. Concomitant surgical interventions : in 2 patients – plastic surgery of an interventricular defect ; in 1 – correction of the PTA ; in 1 – correction of the coarctation of the aorta using a bypass.

From the cited data it follows that bicuspid aortic valve is the most frequent congenital CVD predisposing to infectious endocarditis, which is observed least frequently in PTA. ■

POSTER N° 24

OSTEOARTICULAR INFECTIONS COMPLICATING INFECTIVE ENDOCARDITIS : 30 CASES OVER 33 YEARS

Eykyn SJ, Lamas CC

St. Thomas' Hospital, London, United Kingdom

Thirty cases of osteoarticular infections (OAI) complicating infective endocarditis (IE) presenting to St. Thomas' Hospital (STH) between 1969 and 2002 were analysed. The incidence of OAI over the whole period was 30/693 (4,3 %), and was 4/113 (3,5 %) in the 70's, 5/164 (3 %) in the 80's and 15/279 (8,4 %) in the 90's. Twenty two cases were male and 8 female. Thirteen of 30 cases (43 %) were pathologically proven ; twenty-two (73 %) were clinically definite by the modified Duke criteria and 8 (27 %) were probable. The respective figures using the STH modified criteria were 83 % and 17 %. There were 9 IVDU in the study. The proportion of IVDU and of cases of *S. aureus* endocarditis in the 70's, 80's and 90's was similar for the 693 cases. Blood cultures were positive in 27/30 (90 %) ; 2 patients had negative blood cultures and 1 did not have blood taken. Only Gram positive organisms were isolated (*S. aureus* 17 with 1 MRSA, CNS 3, viridans streptococci 2, group B streptococcus 2, group A streptococcus 1, *S. aureus* and group A streptococcus 1, *E. faecalis* 1). Culture of joint fluid or bone was positive in 14/17 cases where it was done ; organisms were *S. aureus* 10 (1 MRSA), CNS 3 and Group B streptococcus 1. In 25 patients only one osteoarticular site was involved (vertebrae 9, knee 4, hip 4, ankle 4, shoulder 2, sacroiliac joint 1,wrist 1) ; in the other 5 multiple sites (shoulder + acetabulum 1, elbows + wrist 1, MCP + finger + forefoot 1, shoulder + vertebrae 1, wrist + knee 1) were involved. No difference was noted between IVDU and non-IVDU as to sites involved. Diagnosis of OAI was based on microbiology only in 10 cases (33 %), on radiological evidence only in 6 (20 %), on microbiology and radiology in 4 (13 %) and on clinical evidence only (severe persistent pain, swollen red joints) in 10 cases (33 %). Predisposition to joint infection was present in 4/30 (13,3 %) patients (hip prosthesis 1, trauma to knee 1, previous osteomyelitis 2). Patients were treated conservatively with ß lactam antibiotics (25/30, 83 %) or glycopeptides (5/30, 17 %) combined with aminoglycosides (10/30), fusidic acid (5/30) or lincosamide (1/30), except for one who had above ankle amputation. Over half the patients who developed OAI had major embolic complications of IE (pulmonary 5, retina 2, endophthalmitis 2, other central nervous system 4, spleen and/or liver 2, kidney 1) and the overall mortality of the 30 patients with OAI was high (10/33, 33 %). In conclusion, OAI is an uncommon complication of IE but will often accompany cases with multiple major emboli. Incidence increased in the 90's compared to the previous 2 decades. Staphylococci and streptococci are the main causative pathogens. Mortality is high in this subset of patients. ■

ACCUMULATION OF SUDDEN UNEXPECTED CARDIAC DEATHS FROM SUBACUTE MYOCARDITIS IN SWEDISH ORIENTEERS

Friman G, Wesslén L

Infectious Diseases, Dept of Medical Sciences, Uppsala University Hospital, Uppsala, Sweden

Background

In 1992, we were aware of 16 cases of sudden unexpected cardiac deaths (SUCDs) in young (< 35 years) Swedish orienteers that occurred between 1979 and 1992. During this 13-year period, young Swedish male elite orienteers experienced a risk of sudden cardiac death that was 30 times higher than expected. Histopathological re-evaluation uncovered myocarditis in 12 of these 16 cases. In 4 cases there was an additional fibrofatty infiltration, mimicking arrhythmogenic right ventricular cardiomyopathy (ARVC). No doping was involved. Several measures were taken in 1993 in an effort to prevent further deaths. Since then, no new sudden cardiac deaths have occurred in young Swedish orienteers. However, apart from deaths provoked by coronary artery disease, we know of seven additional deaths in orienteers above 35 years of age : five of these were past or present elite orienteers. In addition, at least four elite orienteers experienced life threatening ventricular tachy-arrhythmias. These 11 cases had myocarditis and a disease similar to ARVC.

Methods

Tissues from 5/11 cases were tested for Bartonella by PCR (targeting the glt A gene) and then the products were sequenced. Sera were tested by indirect immunofluorescence for antibodies to 3 Bartonella spp.

Results

Bartonella spp. DNA was detected in the hearts of 4/5 cases and in the lung of the fifth case ; sequences were close to B. quintana in 2 cases, and identical to B. henselae in 3. 10/11 cases had antibodies to Bartonella. The prevalence of antibodies to Bartonella was 31 % in elite orienteers versus 6.8 % in healthy blood donors, indicating a broad exposure to the organism.

Conclusion

Findings suggest that subacute or reactivated Bartonella infection portrayed an important pathogenetic role in the SUCDs in Swedish orienteers. The intimate contact that orienteers have with nature suggests a zoonotic vectorborne infection. Bartonella, a known endocarditis pathogen, may thus provoke subacute myocarditis in man and may be involved in the development of a heart disease similar to ARVC. ■

Poster n° 26

TRENDS IN CLINICAL FEATURES AND OUTCOME OF PROSTHETIC VALVE ENDOCARDITIS

Giannitsioti E, Kanavos K, Skiadas I, Triantafillidi H, Vavouranakis E, Kalikantzaros I, Aggeletopoulos G, Antoniadou A, Giamarellou H and the Hellenic Endocarditis Study Group

4th Dept of Internal Medicine of Athens Medical School, Sismanoglio General Hospital, Athens, Greece

Objective

To study the clinical features and utility of Duke criteria and evaluate outcome in PVE, evolving through time among cases of bacterial endocarditis (BE) referred to the Endocarditis Database coordinated at our centre[1].

Methods and results

Sixty seven (67) cases of PVE were recognized during the last 16 years among 300 cases treated as BE. Forty five (45) of them were diagnosed and/or managed at our center[1]. Seventeen (17) cases had been diagnosed before 1990 (group A) and 50 thereafter (group B). Patients had a mean age of 50 in group A and 67.9 in group B with a male to female ratio of 4.5:1 and 1.27:1 respectively. In both groups involvement of an aortic prosthetic valve predominated (58 %) while early cases of PVE accounted for 70 % in group A and in 24 % in group B. Definite by Duke criteria were 40 % of cases in the first group and pathogens involved included Staphylococcus sp : 6 [35 %, with 50 % of them methicillin resistant (MR)], Streptococcus sp : 2 (12%), Gram negatives : 2 (12 %) and fungi : 2. In the second group definite by Duke criteria were 62 % of cases while among pathogens isolated Staphylococcus sp also predominated (38 %) with a shift to methicillin resistant strains (90 %) followed by Enterococcus sp (14 %), Gram negatives (14 %) and Streptococcus sp (12 %). Culture negative PVE accounted for 22 % in Group B compared to 6 % in the first group. Patients were successfully managed with antimicrobial treatment alone in 78 % in both groups. In group A in hospital mortality was 6 % compared to 26 % in group B. Mortality in the second group was the same in patients treated with or without surgical intervention but 80% of patients on antimicrobials who died had an indication of immediate valve replacement due to heart failure.

Conclusions

Patients treated for PVE are older nowadays with a decreasing male proportion. Early PVE has considerably diminished. Enterococcus and Methicillin Resistant Staphylococcus are emerging as important pathogens, while culture negative PVE has increased. Use of the Duke criteria has increased the sensitivity of definite diagnosis. Management with combined surgical and antimicrobial treatment did not increase in incidence but overall mortality has increased (probably due to older patients with high morbidity and/or a delay in surgical intervention). ■

POSTER N° 27

RHEUMATIC MANIFESTATIONS OF INFECTIVE ENDOCARDITIS IN NON-ADDICTS. A 13-YEAR STUDY

Gonzalez-Juanatey C, Gonzalez-Gay MA, Testa A, Garcia-Castelo A, Vidan J

Cardiology Department, Hospital Xeral-Calde, Lugo, Spain

BACKGROUND

Rheumatic manifestations (RM) are known to be frequent complications of infective endocarditis (IE).

AIM OF THE STUDY

To further investigate the incidence, clinical spectrum, at outcome of patients (pp) with IE and RM.

METHODS

We examined the features of non-addicts pp diagnosed with clinically definite IE according to Duke classification criteria at a single reference hospital during a 13-year period. Between 1987 and 2000, 108 consecutive non-addicts pp had 119 episodes of clinically definite IE.

RESULTS

RM were observed in 50 cases (42 %). They occurred more commonly in men (78 %), with a mean age of 57±17 years. Native valve IE occurred in most cases (86 %). The most frequent valve involved was the aortic (44 %) followed by the mitral valve (30 %) and mitro-aortic (24 %). Myalgia was the more frequent symptom (14 %). Peripheral arthritis, generally as monoarthritis was clinically evident in 16 cases (13 %), and sacroiliitis in 1 patient. Low back pain was described in 16 cases (13 %), septic discitis in 3 cases, and biopsy-proved cutaneous leukocytoclastic vasculitis was found in 4 cases. Other conditions such as trochanteric bursitis and polymyalgia were observed in 2 and 1 case, respectively. Apart from a significantly higher frequency of hematuria ($p < 0.001$) and a trend to lower serum complement levels in pp with RM, no differences in clinical features, laboratory test, or microbiologic blood culture results were found between cases with IE with or without RM. Although pp with RM had more septic embolisms ($p < 0.001$), other complications and the in-hospital mortality rate were no significantly different in pp with and without RM.

CONCLUSION

RM are frequent in pp with clinically definite IE from southern Europe. The presence of musculoskeletal or vasculitic manifestations may be of some help, as warning signs, for the recognition of pp with severe disease who require a rapid diagnosis and therapy. ■

POSTER N° 28

ACTIVE AORTIC ENDOCARDITIS WITH ANNULAR ABCESS : AN ANALYSIS OF RISK FACTORS

Houël R, Nakashima K, Kirsch M, Hillion ML, Loisance D

Hôpital Henri Mondor, Créteil, France

BACKGROUND

Annular abscess is an indication for surgery in the active phase of endocarditis. We analysed preoperative lesions, conditions and surgical technique as determinants of mortality and recurrence.

PATIENTS AND METHOD

From 1995 to 2002, 43 patients underwent surgery for 43 aortic valve active endocarditis associated with an annular abscess. 31 (72.1 %) occurred on native valves. Duration of preoperative adjusted antibiotherapy was less than 10 days in 23 (53 %) patients. *Staphylococcus aureus* was isolated in 14 patients (32 %). All patients underwent an aortic valve replacement using a bioprosthetic substitute in 12 (27.9 %). Aortic root was replaced in 8 instances (18.6 %). The different techniques of annulus repair were also included in the analysis.

RESULTS

Survival was 68 % +/- 7 ; 56 % +/- 8 at 1 and 5 years. Freedom from recurrence was 84 % +/- 5 and 76 % +/- 8 at 1 and 5 year respectively. Multivariate analysis revealed gender and septic shock to be risk factors of early death. No specific risk factors was founded for late death. The use of pericardium and septic shock were identifed to be risk factors of recurrence. The type of sutures, the use of Teflon for annular repair and aortic root replacement were not associated with an increased risk of recurrence or mortality.

CONCLUSION

This study precise the influence of preoperative conditions and surgical technique on the results of extensive surgery for active endocarditis with annular involvement without the use of homograft. These results emphasise the need for comparative studies with homografts in this indication. ■

INFECTIVE ENDOCARDITIS : AN UNDERESTIMATED DISEASE ?

Kelmendi MI, Shllaku FK

University Children's Hospital, Cardiology Department, Prishtina, Kosova

Background

Infective endocarditis (IE) carries a high risk of morbidity and mortality and it's incidence is increasing.

Aim

1. to present our experience in the diagnosis and management of IE in children, focusing especially in the role of echocardiography in this diagnosis.
2. to stress the role of stomatologist, as well as parents' in the prevention of IE in children.

Materials and methods

Last three years at University Children's Hospital, Prishtina, using non-invasive diagnostic techniques, including Doppler echocardiography, the diagnosis of congenital and acquired heart disease is administered in 1256 pts. Excluding a certain number of cardiology pts at low IE risk (PS, CoA, ASD secundum, simple mitral valve prolapse), at least 735 children are in a potential high risk for developing endocarditis. Since the prevalence of dental caries in the children of our area is a very high (74 %) – the risk of IE is greater than in other areas with a low caries prevalence. It must be also kept in mind that approximately 20 % pts with IE have no congenital or aquired heart disease.

Results

As expected, the IE occurrence was unavoidable, developing in six children. The diagnosis was confirmed following the AHA recommendations, major and minor ones. Four of them developed left-sided, the remaining two right-sided endocarditis. There were four pts with acquired and two with congenital heart disease. Despite many difficulties regarding to blood cultures (BC), they were, together with echocardiography of crucial importance in the diagnosis and follow-up of pts with IE. The most common agent was *Streptococcus viridans* occurring in three children, *Staphylococcus aureus* in two and Klebsiella pneumoniae in a patient with right-sided endocarditis. Two of children with IE underwent urgent valve replacement, two children died, one recovered completely, while last patient with right – sided IE is preparing for valve surgery and is prescribed in details.

Conclusion

Since many contributing factors for IE exist (a high number pf pts with CHD and RHD, high prevalence of caries, etc) infective endocarditis is present in our region too. Due to difficulties in the diagnosis, some cases with IE are probably misdiagnosed and seems that the true incidence of IE is undoubtly higher than reported one. For a successful IE prevention in children, except cardiologists, must be included dentists and parents too – as a part of modern concept in endocarditis. ■

POSTER N° 30

INFLUENCE OF MULTIORGAN DYSFUNCTION SYNDROME AND SEPTIC SHOCK ON OUTCOME OF PATIENTS WITH INFECTIVE ENDOCARDITIS

Klinar I, Barsic B, Bio_ina B, Star_evi B, Sutli E, Vincelj J

University Hospital for Infectious Diseases, Zagreb, Croatia

Background

Infective endocarditis (IE) is septic disease and factors that influence outcome of sepsis should be included in the analysis of risk factors for mortality of patients with infective endocarditis.

Aim of the study

To evaluate the major predictors of outcome in 100 consecutive patients with infective endocarditis.

Methods

Single center study of 100 patients with IE. Univariable analyses of the predictors of death which included beside factors associated with IE, the incidence of multiorgan dysfunction syndrome and septic shock, as well as consequent therapeutic measures (mechanical ventilation).

Results

Results of univariable analyses identified that predictors of death are shorter duration of illness before hospitalisation, MODS, septic shock, *S. aureus* infection, central nervous system complications, cardiac decompensation, absence of vegetations and the need for mechanical ventilation. Comparisons between survivors and non survivors are presented on table. ▶

	75 patients	25 patients	
Duration of disease before diagnosis (days)	21.8+-31.2	7.7+-6.6	0.0115
MODS	20 (26.7%)	19 (76%)	< 0.0001
Septic shock	1 (1.3%)	5 (20%)	0.0035
S. aureus infection	22 (29.3%)	15 (60%)	0.0289
CNS complications	22 (9.3%)	20 (80%)	< 0.0001
Cardiac failure	10 (13.3%)	17 (68%)	< 0.0001
Vegetations	55 (73.3%)	10 (40%)	0.0037
Mechanical ventilation	7 (9.3%)	19 (76%)	< 0.0001

CONCLUSION

Our results suggest that parameters of severe sepsis and consequent organ failures should be included in any analysis of predictors of death of patients with IE. ■

POSTER N° 31

INFECTIVE ENDOCARDITIS IN THE ELDERLY

Le Moal G, Paccalin M, Godet C, Landron C, Roblot F, Becq-Giraudon B

Service de Médecine Interne et Maladies Infectieuses, CHU Poitiers, France

BACKGROUND

Infective endocarditis (IE) has frequently atypical presentations in the elderly who explains delayed diagnosis and poor prognosis.

AIM OF THE STUDY

To update epidemiology and characteristics particularities of IE in an elderly group.

METHODS

Study of patients over 70 year-old hospitalized in our department between January 1997 and December 2001 with definite IE diagnosis according to the Duke criteria. The results were compared with those of the French 1-year national survey (Hoen et al. JAMA 2002 ; 288:75-81).

RESULTS

70 patients were included, mean age 77.6 years [70-88], sex ratio 2.0. There was no previously known heart disease in 19 cases. The rate of prosthetic valve IE was 34.3 % (24/70). Clinical features for admission were fever (55.7 %), fatigue (12.9 %), stroke (10 %) and congestive heart failure (11.4 %). The main causative micro-organisms were : streptococci 17/70 (group D 4, oral 11, pyogenic 2) ; enterococci 11/70, staphylococci 26/70. Q fever was diagnosed in 4 patients. Blood cultures were negative in 9 cases. IE occurred more frequently on the aortic valve (31/70). Transthoracic echocardiography was normal or uninterpretable in 28 cases (40 %) while transeosophageal exam always showed vegetations. During treatment, renal insufficiency and antibiotic allergy appeared in respectively 37 % and 11.4 % of patients. Valve surgery was performed in 16 (22.9 %) patients and the in-hospital mortality rate was 17.1 %.

CONCLUSION

Comparing to the French 1-year national survey, our patients have more often underlying heart disease (72.8 % vs 52.6 %, p = 0.002), a higher proportion of enterococci (15.7% vs 7.4 %, p = 0.04) and Q fever (5.7 % vs 0.3 %, p = 0.002), a lower rate of valve surgery (22.9 % vs 49 %, p < 0.01) and an equivalent in-hospital mortality (17 % vs 16 %). Aggressive diagnostic approach and cautious monitoring therapy are required to prevent iatrogenic complications and improve the outcome of IE in the elderly. ■

CHANGES IN EPIDEMIOLOGY AND MANAGEMENT OF INFECTIVE ENDOCARDITIS

Lejko-Zupanc T, Gabrijelcic T, Kozelj M

Department of Infectious Diseases, Medical centre, Ljubljana, Slovenia

Background

As a result of various factors the epidemiology of infective endocarditis has changed in recent years.

Objective

To study the changes in epidemiology, clinical picture, prognosis and management of infective endocarditis (IE) in time period from 1984 to 2000.

Material and methods

All the patients treated for infective endocarditis at the Department of Infectious Diseases in Ljubljana in the years 1984-2000 were prospectively studied. The patients were included according to the Duke criteria. The periods 1984-1993 and 1994-2000 were then compared. The statistical analysis was performed using EpiInfo6 programme.

Results

In the period of 1984-1993 there were 146 patients (90 male/56 female). 115 patients had native valve endocarditis (NVE) and 31 prosthetic valve endocarditis (PVE). Mean age in this group was 49.9 years. The most common causative agents were viridans streptococci in 32.8 % patients followed by *S. aureus* in 14.3 % (2 of 21 *S. aureus* strains were MRSA). Rheumatic heart disease was the most common underlying heart disease present in 23% of the patients with native valve. Eleven patients were operated in the active phase of the disease with postoperative mortality of 7.5 %. The overall mortality rate was 21 %. In the time period of 1994-2000 143 patients were treated of infective endocarditis (113 NVE, 30 PVE). The mean age in this group was 56.8 years. The most common underlying disease was degenerative valvular disease in 34 % patients. *S. aureus* was predominant causative agent (28 %). 6 of the 40 *S. aureus* strains were MRSA. 24 % of the patients were operated in the active phase with postoperative mortality rate of 20 %. Overall mortality was 27 %. There were significant differences between the two time periods. Rheumatic heart disease has significantly decreased as an underlying heart disease (p 0.05). In the time period 1994-2000 significantly more patients had a severe underlying disease such as diabetes, malignancy or previous invasive procedure (p 0.001). *S. aureus* has significantly increased in frequency and has become predominant causative agent in the period 1993-2000 (p 0.03). Although more patients were operated in the active phase the mortality was reduced only in subgroup of patients with staphylococcal endocarditis (p 0.05) (61 % vs. 30 %).

Conclusion

Infective endocarditis remains a disease with high mortality. It appears that in late nineties the disease has become even more severe since it affects predominantly severely ill or immunocompromised patients and has in many ways become a nosocomially acquired infection. The combined medical/surgical treatment has significantly reduced mortality in our patients with *S. aureus* endocarditis. Our data are insufficient to conclude whether this kind of treatment would influence the prognosis of MRSA endocarditis. ■

Poster n° 33

THE USE OF ADDITIONAL MINOR CRITERIA MAY OVERESTIMATE THE FREQUENCY OF DEFINITE ENDOCARDITIS IN PATIENTS WITH *STAPHYLOCOCCUS AUREUS* BACTEREMIA

Lesens O, Hansmann Y, Brannigan E, Remy V, Hopkins S, Martinot M,
Meyer P, Connel B O, Monteil H, Christmann D, Bergin C

Service des Maladies Infectieuses et Tropicales, Hôpitaux Universitaires, Strasbourg, France

Background

In 1997, Lamas et al suggested additional minor criteria to the Duke criteria. These modifications were shown to improve diagnostic sensitivity while retaining specificity.

Aim of the study

To compare the frequency of endocarditis diagnosed using the Duke criteria versus modified Duke criteria in patients with *Staphylococcus aureus* bacteremia.

Methods

During 1 year, 230 consecutive patients with significant *S. aureus* positive blood culture were prospectively enrolled at the St James's Hospital, Dublin, Ireland, Hôpital Civil and Hôpital de Hautepierre, Strasbourg, France. The portal of entry was defined as a localised focus of *S. aureus* infection preceding bacteremia. Other foci were considered to be secondary metastatic infection. Patients were assessed for secondary metastatic infections and followed-up by the infectious diseases consult service. Referring physicians were encouraged to perform at least one surveillance blood culture and transthoracic echocardiography (TTE). Duke criteria and additional minor criteria (newly diagnosed clubbing, newly diagnosed splenomegaly, splinter hemorrhages, petechiae, high erythrocyte sedimentation rate (ESR), C-reactive protein > 100 mg/L, microscopic hematuria, central nonfeeding venous line, peripheral venous line) were prospectively recorded.

Results

The mean age was 65 ± 1 years. Of the 230 patients included, 77 % had TTE and/or transesophageal echocardiography performed and 76.5 % a surveillance blood culture. 22 (9 %) of patients had endocarditis diagnosed using the Duke ▶

criteria. When other minor criteria were added, the diagnosis of endocarditis was assessed as definite in 113 (49 %) patients. Of these 113 patients, 34 (30 %) were considered to have secondary metastatic infection (mainly osteo-arthritis) without evidence of endocarditis.

Conclusion
It is very likely that modified Duke criteria overestimate the rate of endocarditis in patients with *S. aureus* bacteremia. However, patients diagnosed with definite endocarditis using the modified Duke criteria are at risk for secondary metastatic infection different from endocarditis, mainly osteo-arthritis. ■

Poster n° 34

SURVIVAL IN PROSTHETIC VALVE ENDOCARDITIS : A MATCHED CONTROL STUDY

Moore CM, Cabell CH, Wilkinson W, Mick N, Engemann JJ, Fowler VG, Wang A, Shah A, Woods CW, Corey GR, Glower D, Sexton DJ for the Duke Hospital Endocarditis Service
Duke University School of Medicine, Durham, USA

Background
The survival rate of prosthetic valve endocarditis (PVE) is uncertain. Estimates from previous studies have been complicated by the low frequency of the disease, changes in epidemiology, and the changing baseline mortality rate of valve recipients.

Aim of the study
To determine the impact of endocarditis on survival in patients with prosthetic valves.

Methods
We conducted a matched control analysis of 44 patients with definite PVE matched to two controls who survived to time of diagnosis of their matched case. Controls were matched by valve location, age, and date of surgery.

Results
The median time to development of PVE was 389 days after valve surgery (IQR 78, 1225 ; SD = 1259). Patients with PVE were more likely to die during follow up than their matched controls. Mortality in the PVE group (19/44, 43.2 %) was four times that of the control group (9/88,10.2 %) (HR = 2.95 95 % CI = 2.53,3.37). PVE patients continued to suffer substantial excess mortality out to 1000 days, while mortality in controls was concentrated closer to time of surgery.

Conclusions
To our knowledge, this is the first matched control study of survival in PVE. The mortality rate of patients with PVE exceeded that of matched controls for more than three years after diagnosis of endocarditis. ■

Poster n° 35

NATIVE VALVE ENDOCARDITIS IN PROSTHETIC VALVE RECIPIENTS

Moore CM, Cabell CH, Engemann JJ, Fowler VG, Wang A, Woods CW, Corey GR, Sexton DJ for the Duke Hospital Endocarditis Service
Duke University Medical Center, Durham, USA

Background
Patients with prosthetic valves are at risk of developing prosthetic valve endocarditis (PVE) during bacteremia, yet some patients present with native valve endocarditis in the absence of evidence for prosthetic valve infection.

Aim of the study
To explore the hypothesis that prosthetic valve recipients with findings of native valve endocarditis may have infected prosthetic valves despite absence of prosthetic valve lesions on transesophageal echocardiogram (TEE).

Methods
Patients were followed prospectively if they had a disease free prosthetic valve on TEE with definite endocarditis of a native valve.

Results
Six patients met inclusion criteria of native valve endocarditis without initial evidence of PVE. Three of these six (50 %) were subsequently proven to have PVE. Each of these patients was treated with six week courses of multiple antibiotics at the first admission due to clinician concern over possible undetected prosthetic valve involvement. Each patient was rehospitalized within two to eight weeks and found to have PVE on TEE. Two of the remaining three patients suffered rapid mortality which prevented confirmation of PVE status. One patient survived and did not have subsequent evidence of PVE at follow up.

Conclusions
In our small series, five out of six prosthetic valve recipients with findings of native valve IE but not PVE were subsequently diagnosed with definite PVE or died rapidly. These findings suggest that patients with endocarditis in the presence of a prosthetic valve represent a high risk group for PVE and mortality, even in the absence of initial echocardiographic evidence of PVE. These patients merit aggressive diagnostic evaluation and close surveillance. ■

POSTER N° 36

INFLUENCE OF HIV-1 INFECTION IN THE HISTOPATHOLOGICAL CHARACTERISTICS OF LEFT-SIDED INFECTIVE ENDOCARDITIS INTRAVENOUS DRUG ABUSERS

Perez N, Ramirez JF, Claramonte X, Mestres CA, Marco F, García de la Mária C, Armero Y, Jiménez Alzate MP, Benito N, Baraldés MA, Almela M, Moreno A, Jímenez de Anta MT, Gatell JM, Ribalta T, Miró JM and the Hospital Clinic Endocarditis Study Group

Department of Pathology, Hospital Clinic, IDIBAPS, University of Barcelona, Spain

BACKGROUND

Very few studies have attempted a systematic histopathologic study of surgically removed heart valves in patients with infective endocarditis (IE).

AIM OF THE STUDY

To study whether HIV-1 infection can change the histopathological characteristics of valve vegetations in left-sided IE in intravenous drug abusers (IVDA).

METHODS

We reviewed left-sided valvular samples of seven HIV-1 infected and nine HIV-1 non-infected IVDA. All samples were obtained at cardiac surgery. Type of inflammatory reaction (severity and predominant cell population), presence of fibrosis, calcification and neovascularization and the presence of microorganisms by light microscopy were reviewed in all cases. Valve samples were stratified according to the time of antibiotic therapy, using a cut-off of three weeks.

RESULTS

Both groups had similar clinical characteristics with regard to gender (males : 86 % in HIV-1 positive IVDA versus 89 % in HIV-1 negative IVDA), median age (34 years vs 34 years), median time of symptoms before admission (29 days vs 35 days) and median time on antibiotic therapy before surgery (17 days vs 15.5 days). The main histopathological characteristics were the following :

	HIV-1 infected group (%)	Non HIV-1 infected group (%)
Presence of vegetations	78	87
Fibrosis	33	37
Calcification	22	75
Neovascularization	55	37
Microorganisms	33	50

These data correlated with the duration of IE symptoms but did not depend on the duration of antibiotic treatment. Degenerative changes were more often mixoid in the HIV-1 infected group, compared to the predominance of calcification in the non HIV-1 infected group.

CONCLUSION

HIV-1 infected IVDA with IE exhibited some different histopathological changes that may be due to a different cellular response. Future steps in this study include increasing sample size and the addition of a non-drug addiction control group. ■

POSTER N° 37

THE CHANGING EPIDEMIOLOGY OF PROSTHETIC VALVE ENDOCARDITIS

Rivas P, Alonso J, Varea M, Contreras A, Braun B, Mójer F, Górgolas M, Fernández-Guerrero ML

Fundación Jiménez Díaz, Universidad Autónoma de Madrid, Spain

BACKGROUND

Epidemiology and prognosis of the prosthetic valve endocarditis has been changing over the years.

AIM

To study the changing etiology of PVE and the impact of nosocomial acquisition of the infection on prognosis in a single hospital.

METHODS

Retrospective review of cases of PVE during a period of 34 years. Two different periods (P1 from 1970 to 1984 and P2 from 1985 to 2002) were analyzed.

RESULTS

During P1 58 patients with PVE were treated (30 early PVE and 28 late PVE) and during P2 63 (13 early and 50 late PVE). The incidence of PVE decreased from 1,6 % in P1 to 1,43 % in P2 (ns). The incidence of early PVE significantly decreased from 0,8 to 0,29 % from P1 to P2 ($p < 0,05$) and the late PVE from to 0,8 % to 1,1 (ns). The microbiology of early PVE changed over the years : Gram- bacilli decreased from 40 % during P1 to 7,7 % in P2. Staphylococci remained the main causes of early PVE in both periods. The microbial etiology of late PVE also changed over the years with enterococci and *S. aureus* as the leading causes during P2. In addition 11 out of 50 (22 %) cases of late PVE were hospital-acquired. In comparison only 1 patient with hospital-acquired PVE was seen in P1 (3,5 %). These nosocomial infections were caused by staphylococci including MRSA, enterococci and yeast. Mortality of early PVE significantly decreased from 80 % in P1 to 46 % in P2. Mortality due to late PVE did not significantly changed between periods (39 % vs 36 %). Mortality associated with hospital-acquired late PVE in P2 was 64 %.

CONCLUSION

Although the mortality of early PVE has significantly decreased, in this series the mortality of late PVE remains high due to an increasing number of patients who acquired the infection during admission for other diseases. ■

POSTER N° 38

DERIVATION OF NEW CRITERIA FOR THE DIAGNOSIS OF INFECTIVE ENDOCARDITIS (IE) IN FEBRILE INTRAVENOUS DRUG USERS (IDUS) FOR EMERGENCY DEPARTMENT (ED) USE : A NEW GOLD STANDARD FOR THE ACUTE CARE SETTING ?

Rothman RE, Walker T, Majmudar M, Kelen GD

The Johns Hopkins University, Department of Emergency Medicine, USA

BACKGROUND

Only 10 % of the approximately 120,000 febrile IDUs presenting to EDs in the US annually considered at risk for IE, actually have the diagnosis. The Duke Criteria (DC) requires inpatient observation period of up to 4 days, rendering its use moot in the ED.

HYPOTHESIS

A newly derived set of ED based diagnostic criteria for IE in febrile IDUs will maintain the precision of the DC and be at least as sensitive as the DC in predicting ultimate clinical diagnosis of IE.

METHODS

3 year prospective cohort study with continuous 24 hr/day enrollment of consenting adults in urban hospital. Inclusion: Recent IDU (< 6 months) ; T ≥ 38.0 °C. Exclusion : ICU admission. 'ED Criteria' (EDC) derived from the DC, with the following modifications :

(1) only data available within the first 24 hours from time of ED presentation are valid for use ;

(2) 'possible' IE (defined by DC as consistent with IE, but not rejected) is explicitly defined as 1 major and 2 minor criteria, or 4 minor criteria ; and

(3) 'rejected IE' redefined, as not meeting criteria for definite or possible IE.

RESULTS

Of 650 febrile IDUs, 438 (67%) patients were eligible ; 345 (79 %) consented and enrolled. The sensitivity and specificity of the newly proposed EDC vs. DC were 100 % and 98.1 % ($p > .05$). Comparison of the EDC vs. DC for predicting the ultimate clinical diagnosis of IE yielded sensitivity and specificity of 100 % and 85.5 %, vs. 95.8 % and 86.5 % for EDC.

CONCLUSION

The EDC closely parallel the DC and are exceedingly sensitive, surpassing the DC, in predicting the ultimate clinical diagnosis of IE. The EDC could form the basis of an ED-observation unit based 'decision rule' for determining appropriate disposition in febrile IDUs at risk for IE. ■

NONBACTERIAL THROMBOTIC ENDOCARDITIS : CAUSES AND CLINICAL SIGNIFICANCE

Santos-O'Connor F, Renedo G, Mata P, Fernández-Guerrero ML
Fundacion Jimenez Diaz, Universidad Autonoma de Madrid, Madrid, Spain

Background
Nonbacterial thrombotic endocarditis (NBTE) is considered an essential prerequisite for development of infective endocarditis, and although most cases occur on abnormal valves causing turbulence, some patients develop NBTE previously during the course of a variety of diseases.

Aim of the study
To investigate the causes and consequences of NBTE.

Methods
Retrospective review of autopsy cases at a university hospital during a 40-year period.

Results
47 cases of NBTE were assessed. The most common underlying diseases were : neoplastic disease in 27 patients (57 %), chronic infection in 5 (11 %), haematological disorders in 3, collagen vascular diseases in 2, and a variety of chronic debilitating conditions in 6. When comparing the aetiology of NBTE during two periods of time (from 1961 to 1981 and from 1981 to 2002), we noticed an increase of cases associated with collagen vascular disease and invasive procedures in ICU. Thromboembolic events were documented pathologically in 68 % and 53 % of cases for each period. From a clinical standpoint embolic phenomena were detected in 42 % of cases. Cardiac murmurs were noted in 43 % of the patients.

Conclusion
NBTE is a significant cause of morbidity, suspected clinically only in a minority of cases (12 % in our series), for which malignancy continues to be the most common predisposing factor. ■

Poster n° 40

ECHOCARDIOGRAPHIC FEATURES OF DEFINITE INFECTIVE ENDOCARDITIS : A FRENCH STUDY ON 561 CASES

Selton-Suty C, Roudaut R, Bernard Y, Nazeyrolas P, Garbarz E, Alla F, Duval X, Doco-Lecompte T, Delahaye F, Leport C, Hoen B
AEPEI study group, Hôpital Bichat, Paris, France

Background
Echocardiographic demonstration of valve infection now ranks with positive blood cultures as one of the two major criteria for the diagnosis of definite infective endocarditis (IE).

Aim of the study
To describe echocardiographic features of definite IE in the Duke criteria era.

Methods
We reviewed the charts of 561 patients included in the French survey on IE that was conducted in 1999. The case report form included information on clinical and microbiological characteristics of IE. Specific echocardiographic data included transthoracic (TTE) and transesophageal (TEE) description of valve lesions for each infected valve (vegetation, abscess, prosthetic dehiscence, perforation, degree of regurgitation).

Results
Among 561 patients (mean age : 59±17 yrs), echocardiography revealed a vegetation in 487 pts (87 %), an abscess in 92 (16 %), a significant regurgitation in 476 (85 %) and a prosthetic dehiscence in 20 (23 %). Site of IE could not be identified precisely in 49 pts (9 %). Among the 400 cases for whom TTE and TEE findings could be clearly separated, TEE proved to be more accurate in 238 (60 %), yielding an additional identification of a vegetation, an abscess, a perforation and a prosthetic dehiscence in 187 (47 %), 55 (14 %), 15 (4 %) and 6 patients respectively. Among the 264 pts (47 %) treated surgically, information on macroscopic findings were available in 224. Comparison between echocardiographic and macroscopic findings were in complete agreement in 126 pts (56 %), but differed concerning the diagnosis of vegetation in 52 pts (23 %), abscess in 29 (13 %), perforation in 41 (18 %), and prosthetic dehiscence in 2. When sorting responsible micro-organisms in 5 groups (1 : staphylococci n = 167, 2 : streptococci n = 270, 3 : enterococci n = 46, 4 : others n = 49, and 5 : none identified n = 29) and comparing echocardiographic findings among those groups, there was a trend towards a lower frequency of vegetations in enterococcal IE (1 : 90 %, 2 : 87 %, 3 : 74 %, 4 : 88 %, 5 : 86 %, $p = 0.09$), a lower rate of abscesses in staphylococcal IE (1 : 12 %, 2 : 17 %, 3 : 26 %, 4 : 25 %, 5 : 10 %, $p = 0.07$) and a higher frequency of significant regurgitation in streptococcal IE (1 : 78 %, 2 : 92 %, 3 : 87 %, 4 : 80 %, 5 : 69 %, $p < 0.001$) A vegetation was found more often in patients with vascular phenomena ($p = 0.002$), and embolic event ($p = 0.001$). Patients with vegetation more often had a CRP > 120 mg/l ($p = 0.06$) and WBC count > 10 G/l ($p = 0.03$). Patients with abscess ($p < 0.001$), significant regurgitation ($p < 0.001$) or prosthetic dehiscence ($p = 0.04$) were more often operated on than those without such findings.

Conclusion
TEE is of paramount importance for the diagnosis of IE. However, when compared to surgical findings, accuracy of TEE for description of valve lesions often remain suboptimal. Echocardiographic patterns may differ according to responsible micro-organisms. ■

POSTER N° 41

THE INFLUENCE OF REFERRAL ON THE CLINICAL SPECTRUM OF INFECTIVE ENDOCARDITIS : A PROSPECTIVE STUDY OF 1014 CASES OF DEFINITE ENDOCARDITIS FROM THE INTERNATIONAL COLLABORATION ON ENDOCARDITIS (ICE)

Sexton DJ, Olaison L, Cabell CH, Chen A, Durack D, Clara L, Kanj S, Ramos A, Sanchez M, Stryjewski M, Wang A, Mestres C, Street A, Abrutyn E for the ICE Investigators

Duke University School of Medicine and the Duke Clinical Research Institute, Durham, USA

BACKGROUND

A single retrospective study suggested that referral bias should be an important consideration in studying patients with infective endocarditis (IE), yet subsequent studies have not examined that issue.

AIM OF THE STUDY

To determine the clinical spectrum of IE based upon referral status.

METHODS

ICE-PCS began enrollment 1 January 2000. Through 15 November 2002, 1024 cases of definite IE were enrolled by 34 centers representing 15 countries. Each center utilized a standard case report form.

RESULTS

Of the 1024 consecutive cases of definite IE in ICE-PCS, referral status was known on 1014 patients. Of these, 588 were treated at the same facility where diagnosis was made ; 426 cases were transferred from one facility to another for treatment of their endocarditis. When compared to cases that were not transferred, cases of IE that were transferred to another facility were younger (mean age 55.0 vs. 58.0 ; $p = 0.02$) ; more often developed congestive heart failure (46.2 % vs. 35.5 % ; $p = .02$) ; more often underwent valve surgery (59.8 % vs. 34.8 % ; $p < .0001$) ; more often had cardiac abscesses (20.6 % vs. 13.2 % ; $p = .002$) ; and a higher percentage of these patients had strokes (20.8 % vs. 13.8 % ; $p = .004$). Despite the fact that transferred patients more often had heart failure and underwent cardiac surgery, hospital survival in patients in the two groups was similar (mortality rate 19.5 % vs. 19.7 %).

CONCLUSION

These data suggest that referral bias is an important consideration when examining the clinical features and outcome of patients with endocarditis. ■

POSTER N° 42

GENDER DIFFERENCES IN ENDOCARDITIS IN A NATION-WIDE SWEDISH STUDY

Snygg-Martin U, Schadewitz K, Olaison L, for the Swedish Society of Infectious Diseases Quality Assurance Study Group for Endocarditis

Dept of Infectious Diseases, Sahlgrenska University Hospital, Göteborg, Sweden

BACKGROUND

Infective endocarditis (IE) is more frequently identified in men than in women in most reports.

AIM OF THE STUDY

To analyse the impact of gender on differences in diagnostic and therapeutical interventions and prognosis in a population-based case report study in Sweden.

METHODS

A national registry of IE, organized by the Swedish Society for Infectious Diseases, began enrollment 1 January 1995. All 30 departments of infectious diseases and 7 departments of cardiothoracic surgery participated from start. Analysis was performed on 1447 definite cases reported 1995-2002.

RESULTS

Of the 1826 cases of IE reported, corresponding to an incidence in Sweden of 3.0 per 100.000 person-years, 1447 cases were classified as definite IE. Male/female ratio was 2.0:1. Women were older (median age 72 vs 61 years) and had shorter delay from first symptom to treatment (median 7 vs 9 days), Transesophageal echocardiography was performed less often in women (74 % vs 81 %, $p < 0.01$). There was no difference in native valve predisposition, but women had more often prosthetic valve infection (19 % vs 15 % ; $p < 0.05$). Aortic valve involvement was more common in men (52 % vs 40 %, $p < 0.001$). *S. aureus* was more common in women (39 % vs 30 % ; $p < 0.001$), while viridans streptococci (37 % vs 29 %; $p < 0.01$) and enterococci (12 % vs 8 % ; $p < 0.01$) were less common. Heart failure was more common in women (42 % vs 34 % ; $p < 0.01$), but surgical intervention in these cases was performed more often in men (52 % vs 36 % ; $p < 0.01$). Surgical intervention overall was more common in men (26 % vs 19 % ; $p < 0.01$). There was a tendency towards higher in-hospital mortality in the female cohort, but it was statistically significant in native left-sided IE cases only.(14 % vs 10 % ; $p < 0.05$).

CONCLUSIONS

Women are older and a higher proportion has acute endocarditis as compared to men. Women receives less surgical intervention for IE. ■

PREVALENCE AND INTENSITY OF BACTERAEMIA FOLLOWING CONSERVATIVE DENTO-GINGIVAL MANIPULATIVE PROCEDURES IN CHILDREN

Sonbol H, Lucas VS, Wilson M, Roberts GJ

Eastman Dental Institute, University College London, United Kingdom

Background

Bacteraemia following a variety of dento-gingival manipulative procedures is well documented, although data on conservative dentistry is limited.

Objective

To investigate the prevalence, intensity and identity of bacteraemia following dento-gingival manipulative procedures associated with conservative dental treatment. The procedures investigated were placement of rubber dam, matrix band and wedge and gingival retraction cord and use of slow and high speed drills.

Methods

Children and adolescents attending the Eastman Dental Hospital for dental treatment under a general anaesthetic were recruited. A 21 gauge Y cannula was placed in a vein in an antecubital fossa using aseptic technique. A 6ml baseline sample of blood was withdrawn. A single dento-gingival manipulative procedure was carried out before any dental treatment. Thirty seconds later a further 6ml of blood was withdrawn. All blood samples were processed using Lysis Filtration.

Results

205 subjects aged between 4 and 18 years were recruited for this study. Forty one subjects were randomly allocated into each of the five procedure groups.

Procedure	%		cfu/ml	
	Baseline	30s later	Baseline	30s later
Rubber dam	29	54[a]	0.03	3.37[d]
Fast drill	15	22	0.29	0.68
Slow drill	10	22	0.12	0.34
Matrix band and wedge	32	66[b]	0.49	8.46[e]
Gingival retraction cord	22	56[c]	0.34	3.32[f]

[a]p = 0.002, [b]p = 0.0001, [c]p = 0.0001, [d]p = 0.0001, [e]p= 0.0001, [f]p = 0.0001

Conclusions

The prevalence and intensity of bacteraemia is significantly greater in post-procedure samples following placement of rubber dam, matrix band and wedge and gingival retraction cord compared with baseline. This has implications for antibiotic prophylaxis. ■

POSTER N° 44

SURGICAL TREATMENT OF INFECTIOUS ENDOCARDITIS IN PATIENTS WITH MITRAL AND AORTIC PROSTHETIC VALVES : IS REPLACEMENT OF BOTH VALVES NEEDED ?

Alonso J, Varea M, Rivas P, Contreras A, Martinell J, Fraile J, Fernández Guerrero M
Fundación Jiménez Díaz, Universidad Autónoma de Madrid, Spain

BACKGROUND
The decision to remove one or both valves in patients with left-sided PVE remains unsolved. Although the involved dysfunctional valve/s must be certainly replaced, in the case that only one seems infected, some have suggested that both valves must be replaced anyhow.

AIM
In order to answer this question we have reviewed our experience dealing with patients with PVE that had both mitral and aortic prosthesis in place.

METHODS
Retrospective review of cases of PVE during a period of seventeen years in a university-affiliated hospital. Patients have a definitive diagnosis of PVE.

RESULTS
During the study period 65 PVE were studied. 16 were patients who had both mitral and aortic prosthetic valves. 14 had mechanical valves. 94% of cases were late-onset PVE. Staphylococci (6), streptococci (5), enterococci (2) and miscellaneus microorganisms (2) were isolated. By clinical and echocardiographic critèria PVE involved mitral in 7 cases, aortic in 5 and both valves in 3 cases. 14 patients were taken to the operating room because of cardiac failure (11) or breakthrough bacteremia (3). In 4 patiens both valves were replaced, 3 with a clinical diagnosis of site involvement before surgery and another one with an unsuspected dysfunction of the mitral valve. Three of them died. In 10 patients only the involved valve (by clinical and anatomic criteria) was replaced. Four of these patients died shortly after the procedure of causes associated with cardiac failure without signs of relapsing infection. Six patients survived and relapses were not seen. After a follow-up of at least 4 years, no reoperations were needed. A hundred per cent correlation was found between clinical and anatomic diagnosis of valve involvement.

CONCLUSION
In patients with mitral and aortic prosthesis and PVE who need surgery, the replacement of the single involved valve seems a safe strategy. ■

POSTER N° 45

RIGHT ATRIAL MURAL ENDOCARDITIS. AN UNUSUAL CASE

Amorim S, Santos FR, Abreu R, Araújo V, Oliveira NP, Campelo M, Bastos P, Maciel MJ
Cardiology Department, Hospital de São João, Portugal

A 71-year-old farmer with a known history of past-smoking, hypertension and atrial fibrillation was admitted to our hospital because of recorrent episodes of fever, chills and muscular pain lasting about one month. There was no history of alcohol or ilicit drug abuse, travelling, previous invasive organ procedures and no contact with tuberculosis infected people. The physical examination was nearly normal, except for the presence of multiple dental caries and signs of chronic venous insufficiency in both legs, without injured skin. White blood cell count and active protein C had very high values (45.000/mm^3 and 220 mg/dl, respectively), viral serologies were negative and the urine and blood cultures were persistently sterile. The thoracic X-ray showed cardiomegaly and the abdominal echography was normal. Following the study of that unknown fever, he made a thoracic computed tomography scan which revealed a cardiac mass, coming from in the right atrium (RA). He was then submitted to a transesophageal echocardiogram that showed a heterogeneous, sessile, mobile mass, measuring 5 by 3 cm, inside the right atrial appendix, without involvement of caval veins. There were no abnormalities of the cardiac valves and there was slight mitral and tricuspid regurgitation. The cardiac magnetic resonance, which revealed a mass inside the RA with low signal on T1 image and high signal on T2 image and an air-liquid level in its content.
The patient remained febrile despite gentamicin, vancomicin and metronidazole so, he was submitted to excision of the cardiac mass, which involved near 80 % of the free wall of the RA. The pathological exam showed an acute supurative inflammation of the endocardium, with destruction of the adjacent endocardium and myocardium. The search of microorganisms with specific colorations (Gram, Grocott, PAS, PSA-D) was negative. The patient became assymptomatic and afebrile, without clinical evidences of systemic or localised infection. ■

PROGNOSTIC FACTORS OF MORTALITY IN AORTO-CAVITARY FISTULOUS TRACT FORMATION IN INFECTIVE ENDOCARDITIS

Anguera I, Miró JM, de Lazzari E, Vilacosta I, Almirante B, Anguita M, Muñoz P, San Román JA, de Alarcón A, Ripoll T, Navas E, González-Juanatey C, Cabell CH, Sarriá C, García-Boláo I, Paré C, Evangelista A, Mestres CA, Gumá JR and the Aorto-cavitary Fistula in Endocarditis Working Group

Corporació Sanitària Parc Taulí-Hospital de Sabadell. Barcelona, Spain

Background

Extension of infection in aortic valve infective endocarditis (IE) beyond valvular structures may result in periannular complications with resulting necrosis and rupture or valvular dehiscence and subsequent development of aorto-cavitary fistulas (ACF). Because of the rarity of these events the prognostic factors of mortality of ACF in IE have not been adequately addressed.

Methods

In a retrospective multicenter study over 4681 episodes of IE, a total of 76 patients with ACF (1.6 %) diagnosed either by transthoracic or transesophageal echocardiography were identified from 17 centers from two countries.

Results

Fistulas were found in 1.8 % of cases of native-valve IE (NVE) and in 3.5 % of cases of prosthetic-valve IE (PVE). PVE was present in 31 (41 %) cases of ACF. *Staphylococcus* was the most common causative microorganism (46 %) followed by streptococci (33 %). Moderate or severe heart failure (HF) and periannular abscesses were detected in 62 % and 78 % of cases, respectively. Fistulous tracts originated in similar rates from the three sinuses of Valsalva, and the four cardiac chambers were equally involved in the fistulous tract. Surgery was performed in 66 (87 %) patients with an overall mortality of 41 %. Multivariate analysis identified moderate or severe HF (OR 3.4, CI 95 % 1.0-11.5), prosthetic IE (OR 4.6, CI 95 % 1.4-15.4) and emergent or urgent surgical treatment (OR 4.3, CI 95 % 1.3-16.6) as variables significantly associated with an increased risk of death.

Conclusions

Aorto-cavitary fistulous tract formation is an uncommon but extremely serious complication of IE. In-hospital mortality was exceptionately high despite aggressive management with surgical intervention in the majority of patients. Prosthetic IE, urgent surgery and the development of HF identify the subgroup of patients with IE and ACF that have significantly increased risk of in-hospital death. ■

POSTER N° 47

AORTO-CAVITARY FISTULOUS TRACT FORMATION AND PERIANNULAR ABSCESSES IN INFECTIVE ENDOCARDITIS. DIFFERENCES IN CLINICAL, ECHOCARDIOGRAPHIC FEATURES AND IN-HOSPITAL MORTALITY

Anguera I, Miro JM, Anguita M, Gonzalez-Juanatey C, Garcia-Bolao I, De Alarcon A, Muñoz P, Lazzari E, Paré C, Mestres CA, Guma JR, Vilacosta I, Almirante B, San Roman JA, Ripoll T, Navas E, Cabell CH, Sarria C and the Aorto-Cavitary Fistula in Endocarditis Working Group

Corporació Sanitària Parc Taulí-Hospital de Sabadell. Barcelona, Spain

Background

Aorto-cavitary fistulas (ACF) in infective endocarditis (IE) result from rupture of periannular abscesses (PA) and pseudoaneurisms. Whether patients with ACF in IE present with distinct clinical characteristics and higher mortality compared with non-ruptured abscesses is unknown.

Objective

To investigate the differences in clinical, echocardiographic, microbiologic features and prognostic factors of mortality in patients with IE and ACF compared with patients with non-ruptured PA.

Methods

Retrospective and multicentre cohort study from 17 centers from two countries. Patients with IE and ACF or PA diagnosed by transthoracic or transesophageal echocardiography and/or confirmed during surgery were included.

Results

A total of 159 patients (83 with PA and 76 with ACF) were identified since 1994 (74 % of males, mean age 54.7 years (range 18-77). Prosthetic valve endocarditis was present in 32 % and 40 % of patients with PA and ACF respectively. Heart failure was present in 60 % and 66 % of patients respectively. Staphylococci were isolated in 39 % of cases of PA and in 46 % of ACF cases. Echocardiography detected moderate or severe aortic valve regurgitation in 45 % and 49 % of patients respectively.

Surgical treatment was required in 85 % of patients with PA and in 87 % of patients with ACF, with a mean time from diagnosis of complication to surgery of 11.1 and 11.0 days respectively. Emergent or urgent surgery was required in 60 % and 66 % of patients respectively. Overall in-hospital mortality was 31 % and 41 % for patients with PA and ACF respectively ($p = 0.2$) and mortality in surgically-treated patients was 28 % and 42 % respectively ($p = 0.1$).

Conclusions

PA and ACF formation in the course of IE are associated with similar clinical, echocardiographic and microbiologic characteristics. Despite management with surgical therapy in this subgroups of patients was similar, we observed a trend towards increased mortality in patients with ACF. ■

POSTER N° 48

EARLY DIAGNOSIS AND TREATMENT STRATEGY WITH THE PATIENTS WITH PROSTHETIC VALVE ENDOCARDITIS (PVE)

Atzev BG, Jorgova J, Tschirkov A

University Hospital "St. Ekateria", Sofia, Bulgaria

BACKGROUND

Advances in diagnostic technique and new methods of surgical and medical treatment have determined the necessity of separation in the approaches of clinical characteristics, diagnostics and treatment of PVE by temporal sign.

AIM OF STUDY

To determine the differences in diagnosis of PVE and therapeutic strategy occurring < 10 days (very early), between 11-182 days (early) and between 182-365 days (late) postsurgery.

METHODS

62 patients (pts) with definitive PVE were examined and divided in 3 groups : Group 1 (G1) (very early)-35 pts, mean age (MA) 50,8 years ; Group 2 (G2) (early)-15 pts, MA= 49.1 years ; Group 3 (G3) (late) - 12 pts, MA = 50.0 years, p=NS.

RESULTS

Clinically the authentic difference between the groups was based on fever cases (91,4 % in G1 ; 80 % in G2 (p1-2 = NS), 33,3 % in G3 (p1-3 < 0,001) and on III-IV valve regurgitation (2,8 %, 46,6 % (p1-2 < 0,001) and 25 % of pts (p1-3 < 0,005 correspondingly). The localization of valve lesion wasn't authentically different. The stroke and embolism were found in 8,6 % in G1, in 33,3 % in G2 and in 25 % in G3 (p1-2 = NS, p1-3 = NS). Vegetations had 82,2 % of pts in G1, 86,6 % in G2 (p1-2 = NS) and 58,3 % in G3 (p1-3 = NS). The congestive heart failure had 22,8 % of pts in G1, 26,6 % of pts in G2 (p1-2 = NS) and 0 % in G3. Microbiological data revealed the prevalence of the negative culture tests in all groups and no authentic difference in agents' dividing between the groups. In 82,9 % of pts in G1, 20 % of pts in G3, (p1-2 < 0,001) and 41,6 % of pts in G3 (p1-3 < 0,01) medical therapy continued more than 30 days. The early valve surgery was made in 17,1 % of cases in G1, in 73,3 % of cases in G2 (p1-2 < 0,001), in 50 % of cases in G3 (p < 0,05). There was no mortality case in G1, in G2 the number of deaths was 26,6 % (4 pts) and in G3 - 8,3 % (1 pt).

CONCLUSIONS

The fever and echocardiographic findings are very important diagnostic signs for the early PVE only (Group 1), the medical therapy (antibiotics) is the most efficient for this periodic group and indications for surgery are limited. The surgery is very important method of treatment in Group 2 and 3. ■

POSTER N° 49

PREDICTORS OF MORTALITY IN EARLY SURGICAL INTERVENTION FOR ACTIVE NATIVE VALVE ENDOCARDITIS AND SIGNIFICANCE OF ANTIMICROBIAL THERAPY. A SINGLE CENTER EXPERIENCE

Balasubramanian S, Bherenwala A, Nezwi O, Prasad S, Mankad P

Cardiothoracic Surgery Department, The Royal Infirmary of Edinburgh, Scotland

BACKGROUND

Surgery for active infective endocarditis remains a challenging and high-risk procedure in cardiac surgery. We studied the outcome from early surgical intervention for active native valve endocarditis (ANVE) in our institution.

AIM OF THE STUDY

To determine significant predictors of mortality and also to find the relationship between difference in duration of antibiotics and morbidity and mortality.

METHODS

From January 1996 to February 2002, 61 ANVE patients undergoing operation within four weeks of diagnosis. 29 patients had less than 2 weeks of antibiotics (Group A) and 32 patients had 2 to 4 weeks of antibiotics (Group B). Patients were followed up for 72 months post operatively. Data was collected retrospectively and analyzed using SAS V8 statistical packages. To determine factors related to mortality Kaplan-Meier survival analysis was used making use of the log rank statistics to determine whether there was evidence of significant difference between the factor groups. Relationship between difference in duration of preoperative antibiotics and morbidity was determined using Chi-Squared and Fishers Exact tests were used as appropriate.

RESULTS

Overall 30 days mortality was 14.8 % (Group A- 6.6 %, Group B-8.2 %). Early and late prosthetic valve endocarditis was 0 % and 1.6 % (only in Group B) respectively. Five-year survival was 81.9 %. Predictors of mortality are extensive infection (multiple valve and extravalvular infection) (40.9 %, p 0.0135) ; poor left ventricular function (16.4 %, p < 0.0001), cardiac failure as an indication for operation (34.4 %, p < 0.0001), postoperative sepsis (14.7 %, p < 0.0001), renal failure after surgery (29.5 %, p 0.0002) and use of bioprosthetic valve (24.6 %, p 0.0457). There is no difference between two groups (A&B) with regard to extensive infection (p 0.9523), postoperative sepsis (p 0.2758), reoperation (p 0.3305) and mortality (p 0.2758).

CONCLUSION

Duration of preoperative antibiotics does not have significant influence on postoperative morbidity and mortality in the patients undergoing early surgery for ANVE. Early surgery before spreading of infection and onset of cardiac failure is recommended for better prognosis. ■

CO-TRIMOXAZOLE AND METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS*. CORRELATION BETWEEN DECREASING CONSUMPTION AND RESISTANCE

Bishara J, Samra Z, Leonard Leibovici L, Pitlik S

Department of Internal Medicine "C" and Infectious Diseases Unit, Rabin Medical Center ; Beilinson Campus, Sackler School of Medicine, Tel Aviv University, Petach-Tikvah, Israel

Background

In addition to vancomycin, methicillin resistant *S. aureus* (MRSA) strains, occasionally are sensitive to non-ß-lactam antibiotics, including co-trimoxazole.

Aim of the study

To study trends of susceptibility to co-trimoxazole among hospital-acquired MRSA (HAMRSA) bloodstream isolates in an era of reduced usage of this antimicrobial drug in our institution.

Methods

Data was derived from the prospectively recorded Bacteremia Computerized Database from 1988 to 1997. Antibiotic susceptibility was tested using the disk diffusion technique on, according to the National Committee for Clinical Laboratory Standards. Bacteraemia was considered to be hospital-acquired if it appeared 48 hours after admission. The consumption of different antimicrobial drugs was calculated according to the pharmacy data of our institution, by using the defined daily dose (DDD) method.

Results

During the study period, a total of 944 episodes of *S. aureus* bacteraemia were documented. There were 598 (63 %) hospital-acquired episodes. Among the hospital-acquired episodes, 270 (45 %) were due to MRSA strains. The HAMRSA isolates were persistently highly resistant to chloramphenicol (69 % in 1988 and 100% in 1997 ; p = NS) and with increased resistance to clindamycin (62 % in 1988 to 92 % in 1997 ; p = 0.04), and to fucidic acid (6 % in 1988 to 14 % in 1997 ; p = 0.03). On the other hand rates of resistance to co-trimoxazole among HAMRSA have decreased significantly from 69 % in 1988 to 8 % in 1997 (p = 0.0001). All isolates were sensitive to vancomycin.

The consumption of co-trimoxazole was reduced from 28 DDD/1000 hospital days in 1990 to 17 DDD/1000 hospital days in 1997. While overall trend of clindamycin consumption during the recent decade was unchanged.

Conclusions

Our study demonstrated a parallel decrease in co-trimoxazole consumption and rates of in-vitro resistance to this drug among HAMRSA. Our findings may support the use of co-trimoxazole for the treatment of infections caused by MRSA strains sensitive to this drug. ■

Poster n° 51

CHANGING PATTERN IN INFECTIVE ENDOCARDITIS (IE), 22 YEARS EXPERIENCE AT THE UNIVERSIDAD CATOLICA DE CHILE HOSPITAL (1980-2001)

Braun S, Chamorro G, Irarrazabal MJ, Zalaquett R, Labarca J, Perez C, Escalona A

Departamento de Enfermedades Cardiovasculares, Escuela de Medicina, Universidad Católica de Chile, Santiago, Chile

Background and objectives

To evaluate changes in demographic and clinical characteristics, causative micro-organisms, management and outcome of patients (pts) with IE during 2 periods at a university hospital in Chile.

Methods

Demographic characteristics, causative micro-organisms, clinical management and outcome were compared in 2 groups of pts, who fulfilled the Von Reyn and later the Duke criteria for IE, admitted at our hospital from January 1980 to December 1991, and January 1992 to December 2001.

Results

A change in demographics (increase in age, displacement of rheumatic heart disease as underlying condition) and in spectrum of causative micro-organisms (*Strep. viridans* has been displaced by *S. aureus*, coag negative staph and gram negative micro-organisms) were observed. There was no significant difference in the rate of other patient characteristics, complications, surgical treatment and mortality. ▶

	Jan 80 / Dec 91	Jan 92 / Dec 01	p
N	145	173	
Age (yrs) + SE	46 + 15.3	54 + 18.1	0.037
Sex (male) %	68	70	
Definite %	68	84	0.0115
Native/prostheses %	76/25	74/22	
Rheum / Myxom/healthy %	31 / 14 / 17	17 / 17 / 25	0.01
Microrganisms (%):			
Strep. viridans	27	15	0.028
S. aureus	10.4	14.4	
Coag negative staph	5.5	11	
Others	25.6	31.2	
Negative blood cultures	31.7	26.6	0.31
Complications, treatment and outcome:			
Heart failure %	56	42	
Embolization %	32	35	
Surgery %	52.3	52.6	
Death (surgical)	14.4	9.9	0.2
Death (total)	17.2	17.3	

CONCLUSIONS

Despite the progress in microbiological and clinical diagnosis, and the developments in surgical therapy the outcome (rate of complications and mortality) remained unchanged in these 2 groups of pts. ■

POSTER N° 52

ASSESSMENT OF ECHOGRAPHIC PARAMETERS FOR EMBOLIC EVENTS PREDICTION IN INFECTIVE ENDOCARDITIS

Candea V, Iliuta L, Savulescu C, Moldovan H, Gherghiceanu DP, Vasile R, Filipescu D, Macarie C

"Prof. Dr. CC Iliescu" Institute of Cardiovascular Diseases, Bucharest, Romania

BACKGROUND

Emboli are life threatening events in patients with infective endocarditis (IE) and the risk for these events is frequently correlated with the size, site and mobility of vegetation evaluated by transesophageal echography (TEE).

AIM

Assessment of echographic parameters for embolic events in patients with IE and evaluating TEE value in embolic events prediction.

MATERIAL AND METHOD

236 patients (58 % male, mean age 47.8 ± 6) diagnosed with IE on Duke criteria were followed-up during 3 years. The echographic parameters assessed were : maximum length, narrowest diameter, neck, mobility defined as displacement angle of vegetation long axis throughout the cardiac cycle. Statistical analysis used SYSTAT and SPSS programs for simple and multiple linear regression analysis, correlation coefficient calculations.

RESULTS

1. The incidence rate of embolic events was 51,27 %, without significant differences regarding sex, age, fever, anemia, vegetation site or regurgitation murmur.
2. The univariate analysis identified a significant correlation between embolic event and IE with Staphyloccocus, IE of right heart, length and mobility of vegetation. The independent predictors of embolic events were maximum length > 15 mm (RR = 4.92, p = 0.0001) and increased mobility of vegetation with a maximal angle > 60.7° ± 12 (RR = 8.2, p = 0.003).
3. The echographic differences between patients with embolic events and the others are shown in Table 1.

Table 1 :

Embolic event	NO	YES	p-value
Maximum length (mm)	6.2 ± 0.03	12.6 ± 0.04	< 0.001
Maximum width (mm)	3.9 ± 0.01	7.2 ± 0.02	< 0.003
Neck/width ratio	0.78 ± 0.2	0.42 ± 0.2	< 0.001
Maximal angle of displacement of vegetation (°)	25.1 ± 10	71.8 ± 14	< 0.0001

▶ **Conclusions**

1. Vegetation size and mobility revealed by TEE are important predictors for unfavorable prognostic in IE with embolic risk.
2. Significant echographic predictors for embolic events occurrence were : vegetation length > 15 mm, neck/width ratio > 0.69, maximal angle of displacement of vegetations throughout the cardiac cycle > 60.7°.
3. Early TEE in IE can identify the patients with high risk for embolic event, who are candidates for early surgical treatment (patients with very mobile and big vegetations). ■

Poster n° 53

INFECTIVE ENDOCARDITIS (IE) IN INTRAVENOUS DRUG USERS (IVDU) : PREVALENCE OF LEFT HEART INVOLVEMENT AND CHANGING MICROBIOLOGIC PROFILE

Carozza A, Romano G, De Feo M, De Santo L, Ragone E, Tripodi MF, Durante Mangoni E, Utili R

Department of Cardiothoracic and Respiratory Science, Second University of Naples, Italy

Background

Endocarditis in IVDU is assumed to affect mainly the tricuspid valve and be due to *Staphylococcus aureus*. Recent reports have suggested that involvement of left-sided valves may be more common than believed.

Aim

To reassess the clinical and microbiological characteristics of endocarditis in IVDU.

Methods

Retrospective analysis of 41 cases of definite endocarditis admitted to our Institutions since 1983.

Results

M/F was 38/3, median age 30 years (range 20-47). Three patients were HIV+, 20 HCV+, 2 HBV+, 1 HBV+HCV+. Endocarditis occurred on native valve in 36 patients and on prosthetic valve in 5. Valves involved were : aortic 17, tricuspid 12, mitral 6, tricuspid+aortic or mitral 2, aortic+mitral 4. *Staphylococcus aureus* was isolated in 20 cases (10 tricuspid and 10 left-sided), *S. epidermidis* in 7 (2 tricuspid, 5 left-sided), Streptococci in 9 and culture negative in 5, all left-sided. Embolic events (single or multiple) were observed in 24 (59 %) patients (11 pulmonary, 6 cerebral, 2 renal, 3 peripheral, 4 splenic). Thirty-eight patients underwent surgery (16 for heart failure, 12 for persistent infection, 10 for recurrent embolism). Thirty-five patients had valve replacement (22 mechanical, 13 bioprosthesis) and 3 repair. At the time of surgery, 12 patients were in NYHA class IV, 13 in class III. In-hospital mortality was 12 %. Late mortality was 17 % (all left-sided) at a median follow-up of 5 years (range 1-15).

Conclusion

Our data suggest a developing spectrum of IE in IVDU. The disease occurs more frequently on the left heart (71 %), tends to have a severe clinical course and requires surgery in the active phase in the majority of cases. *S. epidermidis* and streptococci are emerging pathogens. An aggressive surgical attitude reduces the early mortality rate. Late mortality was related to left-sided endocarditis. ■

Poster n° 54

THROMBOCIDINS, MICROBICIDAL PROTEINS FROM HUMAN BLOOD PLATELETS, UTILIZED AS DESIGN TEMPLATE FOR NEW MICROBICIDAL PEPTIDES

Dankert J, Krijgsveld J, Drijfhout JW, Kuijpers AJ, Engbers GHM, Feijen J, Zaat SAJ

Department of Medical Microbiology, Academic Medical Center, University of Amsterdam, The Netherlands

Background

Thrombocidin-1 and -2 are microbicidal proteins from human blood platelets, and are derivatives of CXC-chemokines neutrophil activating peptide-2 (NAP-2) and connective tissue activating peptide-III (CTAP-III), respectively.

Aims of the study

To identify microbicidal domains in these "CXC-antimicrobials" by peptide mapping, and to identify residues in these domains required for microbicidal activity.

Methods

Synthetic peptides overlapping each other by 10 residues and covering the entire sequence of CTAP-III were used for initial mapping of microbicidal activity, and finemapping was done using peptides shifted by 1 residue.

Results

Testing of microbicidal activity of these peptides against Bacillus subtilis, Escherichia coli and *Staphylococcus aureus* and against the fungus Cryptococcus neoformans uncovered two microbicidal domains, one near the C-terminus and one around the CXC-motif in the N-terminal part of the thrombocidin sequence. The most active peptide from the N-terminal domain was used for further characterization and optimization of microbicidal activity. The 2 cysteines of the CXC-motif in this peptide were indispensable for microbicidal activity. Replacement of individual positively charged amino acids by the neutral alanine decreased microbicidal activity in all cases, while lysine substitutions of individual neutral residues yielded several peptides with microbicidal activity equaling that of full length thrombocidins. C-terminal amidation of the most active peptides further increased bactericidal ▶

activity. The peptides with optimized microbicidal activity had almost no lytic activity for erythrocytes.

Conclusion

Two microbicidal domains were identified within the sequence of thrombocidins. Peptides with high microbicidal and low hemolytic activity were designed based on the sequence of the peptide defining the most active domain. These peptides or peptides derived from their sequence might be useful to prevent and treat infective endocarditis and other infections. ■

Poster n° 55

DETECTION AND MANAGEMENT OF SPLENIC ABSCESSES IN PATIENTS WITH ENDOCARDITIS

Ebright JR, Alam E, Ahmed H, Tucker R, Levine D
Wayne State University, Detroit, USA

Clinicians remain uncertain about the reliability of symptoms, physical findings, and laboratory results indicating presence of splenic abscess ; the means of differentiating splenic infarcts from abscess ; and the best means of managing patients with splenic infarcts or abscesses. We performed a retrospective study reviewing all cases of endocarditis seen at 2 hospitals in the Detroit Medical Center from 1996-2000. We included all cases whose records were complete and available, who had not previously undergone splenectomy, and who met the Duke criteria for possible or definite endocarditis. Particular note was made of whether any of the following clinical or laboratory features (CLF) suggestive of splenic abscess were present after hospitalization : 1) fever, > 7 days ; 2) abdominal pain or tenderness ; 3) bacteremia > 7 days. Abdominal CT scans and ultrasounds (US) were reviewed and abnormal studies re-evaluated by a radiologist (RT). Pathologic results of removed spleens were reviewed. These, and CT/US results, were correlated with presence/absence of CLF, hospital course and outcome (death/recovery). 166 cases were included in the review. 98 had CT/US performed ; 27 studies were compatible with splenic infarct/abscess. Patients with positive CT/US were more likely to have left-sided endocarditis, positive CLF, and fatal outcome than those with negative studies or no study performed. CLF, however, was not a reliable predictor of presence/absence of infarct/abscess or in differentiating the two. Mortality was significantly lower for patients who underwent splenectomy than in those with positive studies without splenectomy ($p < 0.01$). Currently, we have no reliable clinical method of determining who has a splenic infarct/abscess or in differentiating infarct from abscess. For those with splenic abscess, splenectomy appears to be preferred to medical therapy alone. ■

Poster n° 56

IMIPENEM-TOBRAMYCIN VERSUS CIPROFLOXACIN IN THE TREATMENT OF *PSEUDOMONAS AERUGINOSA* LEFT SIDED EXPERIMENTAL ENDOCARDITIS IN RABBITS

Fanourgiakis P, Samarkos M, Hatzianastasiou S, Kontopoulou T, Vasdeki A, Argiropoulou A, Paniara O, Vaidakis E, Saroglou G
Evangelismos Hospital of Athens, Greece

Background

Medical treatment of left sided *P. aeruginosa* endocarditis (PAE) has a high rate of failures, therefore the optimal antimicrobial regimen is evolving. Ciprofloxacin (CIP) was used successfully in animal models and in clinical practice. High concentrations in vegetations, postantibiotic effect and a quickly achieved, high bactericidal action seem to be its main advantages. Although imipenem (IMP) has some of the drawbacks of the _-lactams against Pseudomonas infections, it has been proved efficacious in some cases of PAE in humans.

Aim of the study

To compare the efficacy of the combination imipenem-tobramycin versus ciprofloxacin in experimental left-sided PA endocarditis in rabbits.

Methods

The Garrison-Freedman model, as modified by Durack, was used. 36 male New Zealand rabbits were inoculated with 10^8 CFU of a mucous strain of PA on first day after catheterisation and were subsequently randomised in three groups : A) No therapy, B) CIP 40mgr/kgr/12h IV and C) IMP 25mgr/kgr/12h IV and TOB 8mgr/kgr/12h IM. On day 8, the surviving animals were sacrificed and the vegetations were homogenized and quantitatively cultivated. Finally, the number of CFU per gram of vegetations was calculated.

▶ Results

Groups	Mean +/-SD log_{10} CFU/gr veg.(no of rabbits)
A) No treatment	8.764+/-0.95 (10)
B) CIP	4.74+/-1.400 (12)
C) IMP/TOB	4.471+/-2.251 (12)

Conclusions

Both regimens reduced significantly the number of CFU/gr of vegetations compared with controls (IMP-TOB vs Controls, $p < 0.001$ and CIP vs Controls $p < 0.01$). There was no significant difference between the two antibiotic regimens ($p > 0.05$), but such the study lacks the power to establish the significance of a relatively small difference, because of the small number of animals. ■

Poster n° 57

EMPIRIC ANTIBIOTIC THERAPY IN INFECTIVE ENDOCARDITIS BASED ON CLINICAL AND EPIDEMIOLOGICAL CHARACTERISTICS

Fortes CQ, Luiz RR

Hospital Universitario Clementino Fraga Filho – Universidade Federal do Rio de Janeiro, Brazil

Background

Empiric antibiotic therapy should be started immediately whenever acute infective endocarditis (AIE) is suspected. The microorganisms in AIE are too virulent they could destroy the valve in few days so antibiotic effective against the presumed bacteria involved should be start before the results of the blood culture.

Aim of the study

To review the definition of acute and subacute endocarditis and propose systematic criteria to classify IE in acute and subacute.

Methods

This is a cross-sectional incidence study carry on HUCCF from 1978 to 1999. *Staphylococcus aureus* (Staph) endocarditis was assumed to represent the acute presentation while viridans group Streptococci (Strep) endocarditis the subacute. Epidemiological and clinical characteristics of the Staph and Strep IE cases admitted in our Hospital that fulfilled the Duke criteria for definite IE were reviewed. Multivariate Logistic regression was used to identify factors independently associated to *S. aureus* and *S. viridans* that could represent acute and subacute presentation respectively.

Results

Thirty-two Staph EI and thirty-tree Strep were analyzed. Symptoms's duration before the IE diagnosis > 20 days, previous heart disease, IV recreation drugs, primary infection focus and neurological abnormalities were variables statistically significant. An algebraic equation was found to estimate the risk of Staph or Strep.

Conclusion

A more precise and systematic classification of acute and subacute endocarditis based on the clinical and epidemiological finding presents at the admission will permit a better identification of the patients that empiric antibiotic treatment should be start before the results of the blood culture. ■

POSTER N° 61

EFFICACY OF LINEZOLID (LZ) IN THE TREATMENT OF EXPERIMENTAL ENDOCARDITIS (EE) DUE TO METHICILLIN RESISTANT (MRSA) OR GLYCOPEPTIDE INTERMEDIATE RESISTANT (GISA) *STAPHYLOCOCCUS AUREUS*

Jiménez Alzate MP, Armero Y, Miró JM, Marco F, García de la Mária C, Moreno A, Almela M, de Benito N, Claramonte X, Sarasa M, Mestres CA, Pérez N, Gatell JM, Jímenez de Anta MT, and the Hospital Endocarditis Study Group

Infectious Diseases Service, IDIBAPS, Hospital Clínic Universitari, Barcelona, Spain

BACKGROUND

Since the appearance of the glycopeptide intermediate resistance in the staphylococci, new alternative therapeutics to vancomycin are needed. Linezolid (Lz) is a new drug and a possible alternative to vancomycin.

AIM OF THE STUDY

We evaluated the efficacy of Lz in therapy (Rx) of experimental endocarditis (EE) in rabbits using two clinical isolates : GISA (ATCC700788) and MRSA 277.

METHODS

Lz and Vancomycin (Van) MIC/MBCs for 700788 and 277 strains were 2/>512, 8/128 and 1/>64, 2/2 mg/L respectively. 24 h after the catheter-induced aortic valve vegetations, 10^6 cfu/mL of GISA 700788 and 10^5 cfu/mL of SARM 277 were injected by iv route. 18 h later the animals were treated for two days with either Lz or Van given with a computer-controlled infusion pump system which simulates the human serum kinetics of either Lz (600 mg iv bid) or Van (1 gr iv bid). Peak and trough serum levels were : 13 and 2 mg/L for Lz, and 46 and 6 mg/L for Van. Control rabbits were sacrificed at the beginning of Rx and treated rabbits 6 h. after the end of therapy and valve vegetations (veg) were quantitatively cultured.

RESULTS

Treat group	survival/total (%)	sterile veg/total (%)	Mean± SD logCFU/g veg
GISA			
Control	-/-	0/27 (0)	9 ± 1.1
Van	17/20 (95)	3/17 (18)	5.8 ± 2.5
Lz	13/16 (81)	0/13 (0)	8.1 ± 1.6
MRSA			
Control	-/-	0/15 (0)	9 ± 0.5
Van	16/16 (100)	5/16 (31)	4.4 ± 2.6
Lz	16/20 (80)	0/16 (0)	7.7 ± 1.5

Therapy with Lz was significatively ($p < 0.05$) more effective than the non-treated group. Van was more effective ($p < 0.01$) than linezolid in sterilizing the vegetacions and in reducing the count of log CFU/g veg.

CONCLUSIONS

Linezolid was less efective than vancomycin in the treatment of GISA or MRSA experimental endocarditis. ■

POSTER N° 62

PROGNOSTIC FACTORS OF MORTALITY IN *STAPHYLOCOCCUS AUREUS* NATIVE VALVE INFECTIVE ENDOCARDITIS : ANALYSIS OF 563 EPISODES FROM THE INTERNATIONAL COLLABORATION ON ENDOCARDITIS MERGED DATABASE (ICE-MD)

Miro JM, Anguera I, Cabell CH, Chen AY, Corey GR, Olaison L, Eykyn S, Hoen B, Abrutyn E, Raoult D, Stafford J, Bayer A, Fowler VG and the ICE-MD Study Group

Hospital Clinic, IDIBAPS, University of Barcelona, Spain

BACKGROUND

Staphylococcus aureus infective endocarditis (SAIE) is a serious but incompletely understood disease. We sough to describe the clinical characteristics and prognostic factors of mortality in a large international cohort of patients with SAIE.

METHODS

The International Collaboration on Endocarditis Merged Database (ICE-MD), was designed to study regional aspects of IE and specific sub-group analyses based upon a large sample of IE patients. The ICE-MD merged 7 existing electronic databases from 5 countries containing 2211 cases of definite IE as determined by Duke Criteria. These databases were combined for analysis using standard definitions.

RESULTS

563 patients (34 %) had native valve SAIE and 1089 patients had IE due to pathogens other than *S. aureus* (NSAIE). Multivariate analysis in patients with SAIE identified age (OR 1.5 95 % CI 1.3-1.7, $p < 0.001$), development of periannular abscess (OR 2.4 95 % CI 1.1-5.3, $p = 0.03$), heart failure (OR 3.2 95 % CI 1.9-5.3, $p < 0.001$) and brain embolism (OR 2.5 95 % CI 1.4-4.4, $p < 0.001$) as variables independently associated with an increased risk of mortality. After adjusting for other clinical characteristics using multivariate analysis, the geographic location of the patient remained significantly associated with mortality, with higher risks for mortality among patients from London (OR 6.2 ; 95 % CI : 2.8-14.0), Barcelona (4.9 ; 95 % CI:2.5-9.9) and Durham (2.5 ; 95 % CI:1.1-5.9) than from sites Goteborg (OR 1 as reference), Besancon (OR 2.1; 95 % CI:0.8-5.4), Marseille (OR 1.8 ; 95 % CI:0.5-6.8) and Philadelphia (OR 0.8 ; 95 % CI:0.2-3.0) $p < 0.001$.

CONCLUSIONS

Native valve SAIE is a heterogeneous disease of global significance. The clinical characteristics and outcome of SAIE vary significantly with geographic region. The reasons for such regional variation in SAIE are unknown and likely multifactorial. Large prospective multinational cohort studies are necessary to confirm these observations. ■

POSTER N° 63

CLINICAL CHARACTERISTICS AND OUTCOME OF INFECTIVE ENDOCARDITIS IN HEMODIALYSIS PATIENTS : REPORT FROM THE ICE INVESTIGATORS

Miro JM, Benito N, Hoen B, Cabell CH, Chen A, Fowler V, Anguera I, Stafford J, Lerakis S, Verhagen DW, Wray DW, Eykyn S, Fortes C, Almirante B, Montagna R, Abrutyn E and the ICE Working Group

Hospital Clinic, IDIBAPS, University of Barcelona, Spain

BACKGROUND

Infective endocarditis (IE) is a very well recognized complication of patients receiving hemodialysis. However, most previous studies were retrospective and were performed at a single center. As a result, clinical description and mortality estimates were defined on few cases collected over long periods.

AIM OF THE STUDY

To describe the current clinical characteristics and outcome of IE in hemodialysis patients (HDP) utilizing the International Collaboration on Endocarditis (ICE) Prospective Cohort Study (ICE-PCS).

METHODS

ICE-PCS collected 1024 cases of definite IE from 34 centers representing 15 countries between January 2000 and November 2002. In ICE-PCS, 102 episodes of IE in HDP (10 %) were identified.

RESULTS

The median age was 54 years (IQR 46-66) and 51 % of the patients were male. The most common co-morbidities were : diabetes (31 %) and chronic immunosuppressive therapy (14 %). A permanent indwelling central catheter or an arteriovenous fistula was present in 51 % and 62 % of cases, respectively. IE was found on native valves, prosthetic valves, or pacemaker/defibrillators in 79 %, 12 % and 9 % of cases, respectively. Other common risk factors were : previous IE (16 %) and preexisting native valve abnormalities (32 %). The causative organisms were *Staphylococcus aureus* (58 %) (MRSA, 24 %), coagulase-negative staphylococci (15 %), *Enterococcus faecalis* (13 %), other bacteria or fungi (9 %), no growth (1 %) and polymicrobial (4 %). Vegetations were documented by echocardiography in 89 % of cases. Valvular involvement was as follows : aortic (30 %), mitral (65 %) and tricuspid (10 %). Surgery was common (45 %) with valve regurgitation (55 %) and heart failure (45 %) the most frequent indications. Complications of IE were frequent including : embolic events (stroke 22 %, other emboli 20 %, total 42 %), heart failure (38 %), intracardiac abscess (18 %), and death (33 %).

CONCLUSION

In the prospective ICE dataset, IE in HDP was common, complications were frequent, surgery widespread, and in-hospital mortality substantial. ■

POSTER N° 64

CORRELATION BETWEEN THE ECHOCARDIOGRAPHIC DIAGNOSIS AND THE SURGICAL FINDS IN THE INFECTIOUS ENDOCARDITIS

Ripoll T, Forteza JF, Alins I, Vallbona B, Garriga MT, Fosch X, Morro C, Riera N, Escandell A

Hospital Son Llàtzer, Palma de Mallorca, Spain

AIM

To evaluate the limitations of the echocardiogram in the morphologic diagnosis of the infectious endocarditis (IE).

METHODS

Inside a series of patients with IE, in the last 9 years, we checked those who underwent surgery, comparing the morphologic finds with the echo preoperative finds.

RESULTS

Of a series of 125 IE's cases there were selected for the analysis 40 to which there was performed surgery (32 %). The most frequent organism was *Staphylococcus aureus* (32 %), existing a high proportion of fungi, polymicrobial infections and negative blood cultures. They affected native valve in 30 cases (75 %) and to prosthesis in 10 cases (25 %). The echo diagnosis was correct in all the cases, but incompletely in 11 (27 %). Of these 11, in 5 TEE had not been performed, and in all of them had passed more than 10 days among the echo and the surgery. There was no incomplete echocardiographic diagnosis in the prosthetic IE. 64 % was produced in native aortic valve IE, being the most common mistakes the missdiagnosis of periannular abscesses, ruptured chordae, valvular perforation and fistulas. There was no significant differences between native valve or prosthesis, aortic or mitral valve, TEE performance or not, and mortality of the group of complete or incomplete diagnosis. Only 1 can be due to the lack of experience of the operator, since it was not confirmed during the review by an expert.

CONCLUSIONS

The echocardiographic diagnosis of IE is correct, but occasionaly incomplete. This did not happen in the prosthetic IE, probably for the major use of the TEE. The periannular abscesses and ruptured chordae occasionnaly escape to the diagnosis. TEE performance, besides ETT, in all the IE with surgical indication, as well as the performance of a new echo just before the surgery, might minimize the incomplete diagnoses in the active IE. ■

POSTER N° 65

ACUTE INFECTIOUS ENDOCARDITIS : EARLY OUTCOME AFTER CARDIAC SURGERY

Rosamel P, Cervantes M, Célard M, Delahaye F, Ninet J, Bastien O, Lehot JJ

Hôpital Cardiovasculaire et Pneumologique Louis Pradel, Lyon, France

INTRODUCTION

Infectious endocarditis (IE) remains a severe disease in spite of prevention (Arch Mal Coeur Vaiss 2001 ; 94:1099-1102). The present study describes the patients operated on during acute IE and their outcome in postoperative intensive care unit (ICU).

MATERIAL AND METHODS

Patients operated on during antibiotic treatment (except IE associated with pace-maker) were included during 36 months in a university hospital. The diagnosis was performed by culture, PCR and/or serologies.

RESULTS

97 patients were included (59.1 % of patients admitted in the same hospital for acute IE) : 54±18 years old (mean±SD), 75 males, duration of disease prior to cardiac surgery = 30 ± 21 days, ICU stay = 11±14 days, hospital stay = 39±27 days. All causative microorganisms were identified : 65 streptococci (23 *S. bovis*), 15 *Staphylococcus aureus* (2 methicillin resistant), 9 negative coagulase staphylococci, 3 Bartonella, 1 Coxiella, 1 Cardiobacterium, 1 Capnocytophagea, 1 Propionibacterium, 1 Klebsiella. The aortic valve was involved in 71 patients. Fifty patients had systemic embols preoperatively. Thirty-five had early postoperative complications (haemodynamic : 23, neurologic : 20, septic : 11). Seventeen patients had neurologic sequellae and 19 died.

DISCUSSION

This series is characterized by a high incidence of *S. bovis* and surgical treatment (especially because of septic embols). The neurologic sequellae and mortality are frequent. Moreover, the interest of new microbiological techniques for the diagnosis is confirmed. ■

POSTER N° 66

DIAGNOSTIC IMPORTANCE OF TRANSTHORACIC ECHOCARDIOGRAPHY (TTE) IN FEBRILE INTRAVENOUS DRUG USERS (IDUS) AT RISK FOR INFECTIVE ENDOCARDITIS (IE) : IS THERE A ROLE FOR ULTRASOUND IN THE EMERGENCY DEPARTMENT (ED) ?

Rothman RE, Walker T, Weiss J, Majmudar MD, Kelen GD

The Johns Hopkins University, Department of Emergency Medicine, USA

BACKGROUND

Although the Duke Criteria (DC) include TTE for diagnosis of IE, urban hospitals in the U.S. often rely solely on blood culture and inpatient observation to confirm or 'reject' IE in febrile IDUs.

HYPOTHESIS

Performance of TTE in febrile IDUs in the ED identifies patients who might otherwise be inadvertently 'rejected' for IE if the test were never performed.

METHODS

3-year prospective cohort study with continuous 24-hr/day enrollment of consenting febrile IDUs in an urban ED. Mandatory TTE (within 24 hours, simulating ED use), as well as standard blood cultures and clinical observation performed on all subjects. Inclusion : Recent IDU (< 6 months) ; T ≥ 38.0 °C. 'Presumed inadvertent rejection' for IE defined using standard DC for 'rejection', i.e. firm alternative diagnosis of manifestations of IE, or resolution of manifestations of IE on antibiotics in < 4 days.

RESULTS

Of 650 febrile IDUs, 438 (67 %) were eligible ; 345 (79 %) were enrolled and had both TTE and blood cultures performed. 48/345 (13.9 %) were ultimately diagnosed as having IE by the inpatient clinicians based on all available data (TTE findings, blood culture results, and clinical observation). 43/48 (89.6 %) had abnormalities on TTE consistent with IE. Importantly, only 30/48 (62.5 %) had persistently positive blood culture findings ; among the remaining 18, 11 had only 1 positive blood culture, and 7 had negative blood cultures. All of these patients had either an alternative source of infection or were clinically improved in 4 days or less of antibiotics, and thus may have been inadvertently rejected for IE had the TTE not been performed.

CONCLUSION

TTE plays a pivotal role in the diagnosis of IE, identifying the disease in more than one-third of febrile IDUs who did not have persistent bacteremia. ED use of TTE in febrile IDUs may lead to improved (and expedited) recognition of IE. ■

POSTER N° 67

SUCCESSFUL TREATMENT OF EXPERIMENTAL AORTIC VALVE ENDOCARDITIS DUE TO METHICILLIN-SENSITIVE *STAPHYLOCOCCUS AUREUS* WITH MOXIFLOXACIN

Skiadas I, Siaperas P, Pefanis A, Papalois A, Triantafyllidi H, Giamarellou H

4th Department of Internal Medicine, Athens Medical School, Athens, Greece

AIM OF THE STUDY

To evaluate the efficacy of Moxifloxacin (M) in experimental aortic valve endocarditis (EAVE), due to a methicillin-sensitive strain of *Staphylococcus aureus* (MSSA).

METHODS

Rabbits with catheter-induced aortic valve vegetations were randomly assigned to a control group, and to two groups receiving M at a dose of 20mg/kg of body weight every 12h, iv, for five days (10 doses). In one (MOXI) of the M groups, rabbits were sacrificed 24h, while in the other (MOXI-TOC) group, 5 days after the last dose of the antibiotic, in order to detect possible relapses of endocarditis after the end of treatment (test of cure study).

RESULTS

The moxifloxacin MIC of the strain of MSSA [mecA(-), bla(-)] was 0,12_g/ml (E-test).The peak (30 min after the 7th dose of M) and trough (12h after the 6th dose of M) levels in rabbit serum were 8,01+2,37_g/ml (n = 24), and 0,36+0,28_g/ml (n = 14), respectively. In 10 rabbits trough serum levels of M were undetectable. The levels of M in vegetations, 12h after the 10th dose of antibiotic, were 2,87+0,75_g/ml (n = 4). Results were as follows :

Regimen	Survival (days) (mean + SD)	No. of vegetation Sterile / Total (%)	log_{10} CFU/g (mean + SD)
No treatment [a]	2,1 + 1,7	0 / 13 (0)	9,30 + 2,15
MOXI [b]	5,7 + 1,0	10 / 11 (91)	2,43
MOXI-TOC [c]	11,6 + 1,3	14 / 14 (100)	-

Maximum survival : b=6 days, c=12 days.
Statistical comparisons : Survival : a vs b : $p < 0,001$ (Kruskal–Wallis test)
Sterile vs non-sterile vegetations : a vs b, and a vs c : $p < 0,001$ (Fisher exact test).

CONCLUSIONS

Moxifloxacin, given at a dose of 20mg/kg b.i.d, for five days, sterilized all, but one, vegetations in a rabbit model of EAVE due to MSSA. No relapses of endocarditis were observed after five days from the cessation of treatment. ■

POSTER N° 68

SHOULD WE ROUTINELY MONITOR BETALACTAM SERUM CONCENTRATIONS DURING THE TREATMENT OF ENDOCARDITIS ?

Tattevin P, Tribut O, Arvieux C, Bentue-Ferrer D, Dupont M, Desbordes L, Le Tulzo Y, Michelet C

Infectious Diseases Unit, Pontchaillou Univ Hosp, Rennes, France

BACKGROUND

Most treatment of endocarditis include high dosages of betalactam agents (BL). Such dosages are not always well tolerated, especially in elderly patients who have the highest incidence of endocarditis. Guidelines for the treatment of endocarditis do not take into account factors such as age, sex or other co-morbidities that may have an impact on BL serum concentrations and thus on tolerance.

AIM OF THE STUDY

To evaluate BL serum concentrations obtained with recommended dosages of beta-lactam during the treatment of endocarditis.

METHODS

Retrospective study of all patients for whom BL dosage was determined by chromatography during the treatment of bacterial endocarditis in our department between 01/01/2000 and 01/01/2003.

RESULTS

Fourteen patients (11 men, 3 women) were studied. Mean age was 61 years (extremes 22-79). Endocarditis was due to *S. aureus* (n = 4), *E. faecalis* (n = 4), *S. bovis* (n = 3), *K. oxytoca*, *S. sanguis* and *S. agalactiae* (1 patient each). MIC of the BL used was determined in 7 cases and was between 0.05 and 0.4 mg/l. BL dosages were performed because of efficacy (n = 6) or tolerance issues (n = 9), including renal failure (n = 7), and encephalopathy (n = 4). Trough amoxicillin level was determined in 13 cases: mean value was 70.7 mg/l, extremes were 23 and 212 mg/l. Trough cloxacillin level was determined in 4 cases : mean value was 48 mg/l, extremes were 16 and 104 mg/l. The determination of BL concentrations lead to a change in BL dosage in 6 patients.

CONCLUSION

BL serum concentrations are often elevated and unpredicted during the treatment of endocarditis : systematic monitoring could prevent overdosage of BL, and thus toxicity. ■

POSTER N° 69

DAPTOMYCIN (D), LINEZOLID (L) AND VANCOMYCIN (V), AGAINST METHICILLIN RESISTANT *STAPHYLOCOCCUS AUREUS* (MRSA) IN AN IN VITRO PHARMACODYNAMIC MODEL WITH SIMULATED ENDOCARDIAL VEGETATIONS

Tedesco KL, Rybak MJ

Anti-Infective Research Laboratory, Department of Pharmacy Practice, Eugene Applebaum College of Pharmacy and Health Sciences, Detroit, USA

BACKGROUND

Daptomycin, a novel lipopeptide antibiotic has demonstrated rapid bactericidal activity in vitro against *Staphylococcus aureus*, an organism which makes up 80 to 90 % of all staphylococci infective endocarditis (IE) cases.

AIM

Compare the activity of daptomycin, linezolid and vancomycin against MRSA at high inoculum with simulated endocardial vegetations.

METHODS

D, V and L MICs were determined in the absence and presence of albumin and calcium-supplemented broth. An in vitro pharmacodynamic model with simulated endocardial vegetations incorporating protein and a high inoculum (9 log-10 CFU/g) was used to simulate regimens of daptomycin at 6 mg/kg/day, linezolid 600 mg every 12 hours and vancomycin 1g every 12 hours against a clinical isolate of MRSA (MRSA-494). All simulations were performed in triplicate, bacterial quantification occurred over 72 hours and potential for development of resistance was evaluated at multiple time points throughout the study.

RESULTS

D MICs in the absence and presence of albumin were 0.25 and 1mg/L, respectively. L MIC's were 2 and 4mg/L and V MICs were 0.5 and 1mg/L, respectively. As early as 4 hours, D kill was greater ($p < 0.001$) than V and L, this difference was maintained throughout the 72 hour experiment. D achieved bactericidal activity (99.9 % kill) by 24 hours versus 72 hours for V. L did not achieve bactericidal kill at any time point over the 72 hour period.

CONCLUSIONS

Daptomycin demonstrated early significant bactericidal kill ($p < 0.001$) against MRSA when compared against vancomycin and linezolid using high inoculum in a simulated endocardial vegetation model, these results warrant further investigation of daptomycin for the treatment of bacterial endocarditis. ■

POSTER N° 70

PROGNOSIS OF INFECTIVE ENDOCARDITIS : CURRENT PREDICTORS OF MORBIDITY AND MORTALITY

Thuny F, Di Salvo G, Casalta JP, Pergola V, Avierinos JF, Cohen A, Derumeaux G, Raoult D, Habib G
La Timone Hospital, Marseille, France

BACKGROUND
Infective endocarditis (IE) has changed during the last decade, but both mortality and morbidity remain high.

OBJECTIVE
To define predictors of morbidity and mortality in a large population of patients with IE from 4 European centers between 1993-2002.

METHODS
Patients with definite IE according to the Duke criteria were included. Patients with pacemaker IE were excluded. Clinical evaluation, TTE and TEE, blood cultures and follow-up were performed in all patients. Predictors of in-hospital morbidity and mortality were defined by multiple logistic regression analysis.

RESULTS
Among 418 definite IE, 34 pacemaker IE were excluded. In the 384 patients (57±17 years) IE affected only native valve in 293 (76.3 %) cases and prosthetic valve in 91 (23.7 %). Early surgery was performed in 201 (52.3 %) cases. The in-hospital mortality rate was 9.6 % and the independent predictors by multivariate analysis were prosthetic valve IE (OR, 4.56 ; p = 0.01), cerebral embolism (OR, 3.14 ; p = 0.005), severe heart failure (OR, 3.10 ; p = 0.01), vegetation length ≥15 mm (OR, 3.04 ; p = 0.01) and renal failure (OR, 3.06 ; p = 0.001). Major embolic events occurred in 253 (65.9 %) cases and the independent predictors were vegetation length (OR, 1.09 ; p < 0.001), severe vegetation mobility (OR, 3.18 ; p < 0.001), *Streptococcus bovis* (OR, 3.18 ; p < 0.001) and *Staphylococcus aureus* IE (OR, 2.56 ; p < 0.002). Severe heart failure occurred in 98 (25.5 %) cases and the independent predictors were moderate to severe regurgitation (OR, 2.32 ; p < 0.001), age > 50 years (OR, 2.28 ; p = 0.002) and underlying heart disease (OR, 1.68 ; p = 0.04). Periannular extension occurred in 94 (24.5 %) cases and the only independent predictor was aortic prosthetic valve IE (OR, 2.38 ; p < 0.001).

CONCLUSION
Predictors of morbidity and mortality have been defined in a context of new demographic and microbiological IE characteristics. ■

POSTER N° 71

INFECTIOUS ENDOCARDITIS - PERIVALVULAR EXTENSION IN PATIENTS HOSPITALISED AT THE INTERNAL DEPARTMENT OF THE COUNTY HOSPITAL

Vahala P, Ruttkay A
Faculty Hospital, Nitra, Slovakia

OBJECTIVE
Based on a retrospective study, to assess the occurrence of infection extension in patients (pts) with native infectious endocarditis hospitalised at the Internal Department of the County Hospital. As well as to assess the clinical course predisposing risk factors, microbiological agents, and echo findings of pts with endocarditis and perivalvular complicatiopns (extension of infection) demonstrated by transesophageal echocardiography or at pathology.

GROUP OF PATIENTS AND METHODOLOGY
In the period of 1997 to 2 001, 600 pts were examined by transthoracic as well as transesophageal echocardiography. Of those, 200 were examined due to suspicion of an infectious endocarditis in process. In 40 pts, an infectious endocarditis was proven according to Duke criteria. This group of pts (with a certain diagnosis in 32 cases and a probable diagnosis in 8 cases) forms the basis for the assessment. The mean age of the pts was 57 years with men prevailing 18/12. The most frequently affected site was the aortal valve in 16 pts (40 %). A primary affection of the mitral valve occurred in 16 pts (40 %), that of the tricuspid valve in 7 pts (17,5 %), and that of pulmonary valve in one patient (2,5 %).

RESULTS
In 7 pts (17,5 %), the echocardiographic examination proved an extension of infection from the aortal valve to the mitral valve tissue (group - I). In the remaining 33 pts (group - II) none of these lesions were found. In one case an aneurysm of the frontal cusp of mitral valve was proved with a small perforation, without vegetations. The condition was treated by replacement of the aortal valve and by suturing the said perforation. Another case of extension of infection from the aortal valve led to occurrence of vegetations also on the frontal cusp of the mitral valve with destruction thereof. The condition was treated by replacement of both aortal and mitral valves. Another case of infection on the suspension apparatus of the mitral valve led to formation of a prolapse of the frontal cusp of the mitral valve developing into a moderately serious mitral insufficiency, currently treated by conservative therapy. Another two cases of extension of infection died. Another two pts were treated by replacement of valves (mitral 1 x, aortal 1 x). The latency period between the onset of symptoms and the diagnosis of infective endocarditis was similar in both groups. Preexistence of heart disease had no association with perivalvular complications. Aortic endocarditis (p < 0,0004), embolism (p < 0,05), new atrioventricular block (p < 0,02), heart failure (p < 0,04), renal failure (p < 0,02), ▶

myocardial infarct ($p < 0,001$), vegetations size in aortal localizations ($p < 0,002$) were related to the existence of perivalvular complications. Surgery was more frequent in these pts, but mortality was similar in both groups.

CONCLUSION

Monitoring of changes in valves and perivalvular tissue by transthoracic and transesophageal echocardiography in the course of treatment of an infectious endocarditis permits early discovery of serious complications. The occurrence of such complications in our group of pts at the Internal Department is 17,5 %. ■

POSTER N° 72

SERIAL C-REACTIVE PROTEIN MEASUREMENTS DURING LEFT-SIDED NATIVE VALVE ENDOCARDITIS

Verhagen DWM, Speelman P, Dankert J, van den Brink RBA, van der Meer JTM

Department of Infectious Diseases, Academic Medical Center, Amsterdam, the Netherlands

BACKGROUND

The duration of therapy in infective endocarditis (IE) is historically standardized because of lack of objective criteria for cure.

OBJECTIVE

Can C-reactive protein values be used to determine the duration of treatment in left-sided native valve IE ?

METHODS

Ongoing prospective observational multicenter study. Patients with suspected IE are reported to the study coordinator (DV), visited to obtain clinical data and followed for three months after discharge. CRP is measured thrice weekly.

RESULTS

152 patients were reported until November 2002, sixty-six were included in the study. Reasons for exclusion were i.e.: prosthetic heart valve, no IE according to the Duke's criteria, no informed consent. The median age was 57 years, 45 were male. The most frequent infecting microorganisms were : viridans streptococci : 31 (47 %), *Streptococcus bovis* : 11 (17 %), *Staphylococcus aureus* : 8 (12 %) and enterococci : 5 (8 %). In all patients, CRP was elevated at the start of treatment. Six patients died and 17 underwent cardiac surgery before the end of American Heart Association standard treatment duration (AHA-STD). In only seven of the remaining 43 patients CRP normalized before the end of AHA-STD. In one of these seven patients the treatment duration was successfully shortened with 11 days. In 36/43 patients the CRP was still elevated at the end of AHA-STD. Treatment was ended at this point in 17 of these 36 patients, none of these patients suffered a relapse. The remaining 19 patients were treated longer than AHA-STD. Only 2/19 had metastatic infection that justified prolonged therapy.

CONCLUSION

Shortening of treatment duration based on CRP was successful in one patient. However, the small proportion of patients to which such a policy would apply makes it impossible to perform a randomized trial. None of the patients in which treatment was ended in spite of elevated CRP suffered a relapse of infection. Therefore, CRP values should not lead to treatment duration beyond AHA-STD. ■

POSTER N° 73

INFECTIVE ENDOCARDITIS REQUIRING HOSPITALISATION IN INTENSIVE CARE UNIT

Zanutto A, Larché J, Doco-Lecompte T, Maurer P, Piquemal R, Pontes M, Weber M, May T, Carteaux JP, Selton-Suty C

Cardiology Dept, CHU Nancy-Brabois, France

BACKGROUND

Infective endocarditis (IE) sometimes presents as a very severe disease and requires emergency transfer to the intensive care unit (ICU).

AIM OF THE STUDY

To describe the characteristics of IE in patients admitted to ICU before surgery.

METHODS

We reviewed the charts of 34 pts (24M/10F, 55±17 yrs) treated for definite IE and hospitalised before any surgical treatment in the ICU of the Infectious Diseases Department of our University Hospital between February 1997 and September 2001.

RESULTS

Reasons for transfer to ICU were severe sepsis in 11 pts, heart failure in 10, respiratory failure in 6, and neurological or other disorders in 7. Two pts had had a cardiopulmonary rescucitation before admission. Comorbidities were present in 23 pts (diabetes, n = 11 ; IV drug abuse, n = 6). There was no previously known heart disease in 22 pts (65 %), and 7 pts had early prosthetic valve endocarditis. TEE was performed in all but 3 patients. Vegetation was diagnosed in 30 pts (88 %, mean diameter : 19±9 mm), abscess in 2, and prosthetic dehiscence in 1. Responsible micro-organisms were found in 32 pts (staphylococci : 18 pts (56 %), streptococci : 13 pts (41 %, group D streptococci : 8), and *Coxiella burnetii* : 1 pt). On admission, mean CRP and corpuscular haemoglobin were 133 ± 85 mg/l and 10.0 ± 2,2 g/dl respectively and mean SAPS was 28.6 ± 18.1. Multiorgan failure developed in 13 pts (39 %), 13 pts (39 %) had acute renal failure, 14 pts (42 %) were mechanically ventilated, and 12 pts (37 %) required administration of positive inotropes.

Valve surgery was performed in most patients (n = 29, 85 %). In one patient surgery was not indicated; in the remaining 4 patients, surgery was withheld although it was clinically indicated, because of their poor condition. Lethality rate was 44 % (12 surgically and 3 medically treated pts).

CONCLUSION

Acute forms of infective endocarditis requiring admission to an ICU frequently occur in patients with comorbidities and without previously known heart disease. Staphylococci are the most frequent responsible micro-organisms. Despite surgical treatment, they still have a very poor prognosis. ■

▶

POSTER N° 74

BACTERAEMIA FOLLOWING ORTHODONTIC TREATMENT PROCEDURES : DEBAND AND GOLD CHAIN ADJUSTMENT

Kyriazidou A, Lucas VS, Gelbier M, Roberts GJ
Eastman Dental Institute, University College London, United Kingdom

BACKGROUND
Bacteraemia following dento-gingival manipulative procedures is well documented. It is unclear which orthodontic treatment procedures could potentially result in the development of Bacterial Endocarditis.

AIM
To investigate the intensity, prevalence and nature of bacteraemia associated with orthodontic treatment procedures. Two procedures were tested : deband and gold chain adjustment.

PATIENTS AND METHODS
Subjects aged between 12 and 19 years old attending the Orthodontic Department at the Eastman Dental Hospital were recruited. Bacterial dental plaque and gingivitis scores were recorded for all subjects. A pre-procedure 6ml blood sample was withdrawn and a further 6ml blood sample was taken 30 seconds after either deband or gold chain adjustment. The blood was processed using Lysis Filtration.

RESULTS
There were 41 subjects in the deband group and 5 in the gold chain group. In the deband group, there were 7 (17 %) positive cultures pre-deband and 12 (30 %) positive cultures after deband. There was no significant difference between the proportion of positive cultures pre and post-deband. There was a significantly greater intensity of bacteraemia (cfus/ml blood) aerobically ($p = 0.03$) after deband compared with pre-deband. There were only 5 subjects undergoing gold chain adjustment. There were 2 positive cultures pre-procedure and 2 following gold chain adjustment. The bacteria isolated included mainly Coagulase Negative Staphylococci, Streptococci, Micrococci and Actinomyces species.

CONCLUSIONS
There was no significant difference in the prevalence of bacteraemia between baseline and post-deband. Overall there was no significant difference in the intensity of bacteraemia pre and post-deband. The aerobic intensity of bacteraemia only, was significantly greater between pre and post-deband. A larger sample of subjects undergoing gold chain adjustment is needed to assess the true prevalence and intensity of bacteraemia associated with this procedure. ■

POSTER N° 75

TOOTHBRUSHING AND BACTERAEMIA IN CHILDREN : PRELIMINARY RESULTS

Lucas VS, Gafan G, Dewhurst S, Spratt DA, Wilson M, Roberts GJ
Eastman Dental Institute, University College London, United Kingdom

BACKGROUND
Antimicrobial prophylaxis is not currently recommended for homecare procedures, such as toothbrushing which can cause significant bacteraemia. Individuals at risk of developing BE with high levels of plaque and gingivitis should be advised to start thorough tooth cleaning. Initially, this may increase the prevalence and intensity of bacteraemia justifying the use of local antimicrobial prophylaxis, for example chlorhexidine mouth rinses. The purpose of this work was to investigate the intensity of bacteraemia (cfu/ml) after toothbrushing to assess if this advice is appropriate.

PATIENTS AND METHODS
Children undergoing general anaesthesia treatment at the Eastman Dental Hospital were recruited. A Y cannula was inserted into an antecubital A Y cannula was inserted into an antecubital fossa vein using aseptic technique. Six millilitres of blood were withdrawn. A second blood sample was taken 30 seconds after toothcleaning with one of the following : (1) Manual toothbrush (2) Braun plaque remover (3) Sonicare electric toothbrush (4) Slow handpiece and rubber cup. A second 6 ml blood sample was taken 30 seconds later. All blood samples were processed using Lysis Filtration and standard culture techniques. ▶

RESULTS

26 children and adolescents have been recruited so far.

Prevalence and Intensity of Bacteraemia after Toothbrushing					
Group	Subjects	Baseline		30 s Later	
		+ve	Cf /ml	+ve	Cfu / ml
Manual toothbrush	5	2	0.4	1	0.2
Braun plaque remover	4	3	1.5	1	0.75
Sonicare electric toothbrush	8	6	0.67	5	25
Slow handpiece + rubber cup	9	0	0	5	28 (p=0.04)

The bacteria isolated were mainly streptococci, coagulase negative staphylococci and Actinomyces species.

CONCLUSIONS

Early indications are that the mean intensity of bacteraemia is significantly greater following use of the slow handpiece + rubber cup. ■

POSTER N° 76

A NEW APPROACH TO ENDOCARDITIS PROPHYLAXIS FOR DENTAL PROCEDURES

Roberts GJ, Ramsdale D

Eastman Dental Institute, University College London, United Kingdom

INTRODUCTION

Antibiotic prophylaxis for dental treatment is recommended when bleeding occurs. This advice ignores procedures where no discernible clinical bleeding is evident but where there is a significant post-procedure bacteraemia.

METHODS

All clinical studies involving the detection of bacteraemia following dental treatment were reviewed. It is reasoned that the only procedures recommended for antibiotic prophylaxis should be those where the post-procedure bacteraemia is statistically significantly greater than the pre-procedure bacteraemia.

RESULTS

The procedures for which antibiotic prophylaxis are recommended are: Periodontal probing, Sialography, Polishing teeth with a Rubber Cup, Oral irrigation with Water Jet, Light scaling, Deep scaling, Scaling teeth with hand instrument, Scaling with ultrasonic instrument, Intraligamental LA, Rubber dam placement, Matrix band and wedge placement, Gingival retraction cord placement, Root planing, Antibiotic fibres or strips placed subgingivally, Gingivectomy, Periodontal Surgery, Root canal instrumentation beyond the apex, Avulsed tooth reimplantation, Tooth separation, Expose OR Expose and Bond Tooth/Teeth, Extraction of a single tooth, Multiple Extractions, Mucoperiosteal flap to gain access to tooth or lesion, Dental Implants (as for Mucoperiosteal flap). All other procedures do not require antibiotic prophylaxis - Air polishing, Infiltration local anaesthesia, Nerve block local anaesthesia, Oral airway for GA, Nasal airway for GA, Laryngeal mask airway for GA, Slow & Fast drilling of teeth, Pulpotomy of primary molar, Pulpotomy of permanent tooth, Root canal instrumentation within the root, Alginate impressions, Orthodontic Band placement and cementation, Orthodontic Band removal, Adjustment of fixed appliances, Incision and drainage of an abscess, Dental Implants Transmucosal fixture (as for biopsy), Suture removal, Removal of Surgical Packs.

CONCLUSION

Comparison of pre- and post-procedure bacteraemia provides a simple way to identify dental procedures that require antibiotic prophylaxis. ■

POSTER N° 77

SUCCESSFUL PROPHYLAXIS WITH MOXIFLOXACIN AGAINST EXPERIMENTAL AORTIC VALVE ENDOCARDITIS DUE TO *STREPTOCOCCUS ORALIS*

Sakka V, Galani L, Iliopoulos D, Athanasopoulos G, Pefanis A, Donta I, Giamarellou H

4th Department of Internal Medicine, Athens Medical School, Athens, Greece

BACKGROUND

Studies related to the prophylactic efficacy of the newer quinolones with enhanced activity against Gram-positive microorganisms, against infective endocarditis are sparse.

AIM OF THE STUDY

To evaluate the prophylactic efficacy of moxifloxacin against experimental streptococcal aortic valve endocarditis.

METHODS

Non-bacterial thrombotic aortic valve endocarditis was induced by the insertion of a polyethylene catheter. Twenty-four hours later, rabbits were randomly assigned to a control group, and groups receiving, either ampicillin (two doses of 40mg/kg each, given iv, two hours apart), or moxifloxacin (a single iv dose of 15mg/kg). Moxifloxacin and ampicillin were administered 1 and _ h, respectively, prior to the iv inoculation of 10^7 CFU of a strain of *Streptococcus oralis* with MICs/MBCs of <0,12/<0,12_g/ml (ampicillin) and <0,003/<0,003_g/ml (moxifloxacin). Rabbits were sacrificed 3 days later and their vegetations were cultured quantitatively.

RESULTS

The serum concentrations of moxifloxacin at 1, 2, 4, 8, and 24h post-dosing were (mean + SD) : 2,8+0,7_g/ml (n = 7), 2,1+0,7_g/ml (n = 8), 1,1+0,5_g/ml (n = 7), 0,3+0,1_g/ml (n = 8) and undetectable, respectively. Results were as follows :

Regimen	No. of vegetations Sterile / Total (%)	log_{10}CFU/g of non-sterile vegetations (mean+SD)
No prophylaxis	1 / 15 [a] (7)	9,07 + 0,91 [e] (n=14)
Ampicillin	5 / 9 [b] (56)	6,63 + 1,99 [f] (n=4)
Moxifloxacin	10 / 12 [c] (83)	8,0F84 (n=2)

Statistics : a vs b : p = 0.015, a vs c : p < 0.001, b vs c : p = 0.331 (Fisher exact test), e vs f : p < 0,001 (Kruskal-Wallis test).

CONCLUSIONS

Moxifloxacin exhibited very good prophylactic efficacy against experimental streptococcal aortic valve endocarditis. ■

POSTER N° 78

DECISION ANALYSIS AND ENDOCARDITIS PROPHYLAXIS IN PATIENTS WITH TETRALOGY OF FALLOT

Stachtou J, Roberts GJ

Eastman Dental Institute, University College London, United Kingdom

INTRODUCTION

Antibiotic prophylaxis is recommended for patients with congenital heart disease before dental treatment, as these patients are susceptible to bacterial endocarditis. It is essential to determine and evaluate the benefits and risks from antibiotic prophylaxis in patients with Tetralogy of Fallot. The technique of decision analysis uses quantitative aspects and attempts to provide a quantity based outcome to help clinicians make decisions. The study aim was to determine the risk from antibiotic prophylaxis using amoxicillin in patients with repaired Tetralogy of Fallot.

METHODS AND RESULTS

Data 3.5 Treeage software was used for decision analysis. The register was searched to obtained reliable quantitative data on probability of development of endocarditis after dental treatment, risk of death without antibiotic prophylaxis for dental treatment and the risk of death from amoxicillin side affects. A number of different decision trees were created for different procedures. In addition, multiple sensitivity analysis procedures were used.

CONCLUSIONS

Utilising the probabilities derived from this literature search it was found that the decision about administration of antibiotic prophylaxis for patients with repaired Tetralogy of Fallot is complex. Although dental procedures carry a risk of bacterial endocarditis, the risks from antibiotics outweigh the benefits in many cases. Sensitivity analysis showed that the decision to advise against antibiotic prophylaxis in patients with repaired Tetralogy of Fallot is a robust clinical decision. Decision trees and sensitivity analysis will be illustrated. ■

POSTER N° 79

A SINGLE MOUTHWASH WITH CHLORHEXIDINE 0.2 % REDUCES THE DURATION OF BACTERAEMIA FOLLOWING DENTAL EXTRACTIONS

Tomás I, Alvarez M, Saavedra E, Limeres J, Padrón N, Diz P
Santiago de Compostela University, Spain

BACKGROUND
The literature is unclear concerning the efficacy of antiseptics in the prevention of bacteraemia following dental extractions (BDE).

AIM OF THE STUDY
To investigate the prevalence, nature and duration of BDE, and to assess the effect of chlorhexidine on BDE.

PATIENTS AND METHODS
One hundred patients scheduled for dental extractions were randomly assigned to group 1 (controls) and group 2 (undergoing a previous one minute mouthwashing with chlorhexidine 0.2 %). Venous blood samples were collected from each patient at 30 seconds, 15 minutes and 1 hour after dental extractions. Blood culture bottles were inoculated and incubated in the Bactec 9240 (Becton Dickinson). Gram stain smears were performed in every positive bottle. The positive bottles were subcultured on 5 % sheep blood agar incubated aerobically and anaerobically, on chocolate agar and MacConkey agar, and incubated at 37 °C under 10 % CO_2. The isolates were identified with the Vitek system (Bio-Mérieux).

RESULTS
The prevalences of BDE in group 1/group 2 were 94/73 % at 30 seconds, 67/28 % at 15 minutes and 21/0% one hour latter. A 48.5 % of positive cultures in the group 1 versus a 28.6% in the group 2 were detected, being *Streptococcus viridans* the most frequently identified in both groups (67 % and 65.5 % respectively).

CONCLUSION
Chlorhexidine mouthwash before dental extractions is effective to reduce the prevalence and duration of BDE, minimizing the risk of focal infections. ■

INFECTION ON CARDIOVASCULAR DEVICES

POSTER N° 80

RISK FACTORS FOR IMPLANTABLE CARDIOVERTER-DEFIBRILLATORS INFECTION

Gil Martínez P, Bayona JF, Rubio JM, Górgolas M, Farré J, Fernández-Guerrero ML
Fundación Jiménez Díaz, Universidad Autónoma de Madrid, Spain

INTRODUCTION
Implantable cardioverter-defibrillators (ICDs) have modified the prognosis of patients with malignant arrhythmias. Infection is an uncommon but serious complication with a reported incidence that varies from 2,2 % to 7,2 %.

MATERIAL AND METHODS
We have retrospectively reviewed all the ICDs implanted in our institution from February 1988 to December 2001 : a total of 278 patients and 423 devices (161 generator changes). Several individual (age, sex, diabetes mellitus, obesity...) and procedural variables were compared between infected and noninfected patients.

RESULTS
Patients were 85,6 % men, mean age was 60 years and mean ejection fraction 37 %. Fourteen per cent of our patients were diabetic and ischemic heart disease was the most prevalent cardiopathy (63,6 %). Antimicrobial prophylaxis was administered by three alternative regimens : cefazolin, vancomycin + gentamicin for penicillin-allergic patients or penicillin + gentamicin + cloxaciline. ICDs were placed transvenously in 96,5 % of patients. ICD patches were mainly performed via subclavicular (62 %) or subcostal approach (33 %). Generator was placed either infraclavicular (68,3 %) or abdominal (31,7 %). Most interventions were performed in one-staged procedure (95,3 %). Infection developed in 10 implanted devices (2,4 %) of 8 patients, and occurred most commonly in the first 30 days after implantation. Infection was significantly ($p < 0,05$) associated with NYHA functional class III, spontaneous trauma on generator, ICD decubitus, two-drugs based prophylaxis, two-staged procedure, subsequent generator changes, and both abdominal location of generator and subcostal surgical approach. Infection presented with local signs of inflammation and there were no systemic complications. All patients but three needed complete removal of the system.

CONCLUSIONS
We have found a low incidence of ICDs infection. Main risk factors seemed related to previous trauma, antimicrobial prophylaxis, abdominal location of generator and not to specific individual variables. ■

POSTER N° 81

VASCULAR PROSTHESIS INFECTIONS : NEW IDEAS ON MANAGEMENT ?

Remy V, Hansmann Y, Lesens O, Hassani O, Chakfe N, Kretz JG, Christmann D
Infectious Diseases Department, Hôpitaux universitaires de Strasbourg, France

BACKGROUND

There is a constant evolution of the management of vascular prosthesis infections (diagnosis, microbiology and therapeutic). Are they new ideas in this pathology ?

AIM OF THE STUDY

To describe prosthetic vascular infections in an University Hospital and the therapeutic management (surgeon and infectiologist).

METHODS

From 1996 to 2001, 40 patients with vascular prosthesis infections have been retrospectively recovered in Cardiac andVascular Surgery and Infectious Diseases Departments.

RESULTS

40 patients (85.7 % males), mean age was 62 +/-2 years. Time between prosthesis insertion and infection was less than 30 days (early) in 50 % of cases, and more than 1 year (late) in 27.5 %. Late infections were aortic localization in only 1/3 of cases. Pathogens were : Staphylococcus 46 % (including 60 % resistant to meticillin), Streptococcus (11 %), Enterococcus (13 %) and Gram negative bacillus (30 %). In 48 % of cases, infection was plurimicrobial. There was no infectious relapse. Mortality rate (4 years follow-up) 10 % (half not linked to infection). Emergency vascular surgery was a risk factor of early infection. Efficient biantibiotherapy took place for 100 +/- 9 days with 38 +/- 4 days by intravenous route. In 27.5 % of cases, surgery was realized in a one-step procedure in situ (3 prosthesis and 9 homografts) and in 11 cases, procedure was only an excision of necrosis and drainage (preferentially early infections, no specific pathogens). Duration of antibiotherapy were 3 months when prosthesis was on site, 6 weeks when prosthesis was removed or substituted for homograft or vein.

CONCLUSION

Characteristics of studied population were comparable to others studies excepted 20.5 % of late infections. Plurimicrobial infections were common (50 %) and resistant enterobacteria were found in 30 % of cases. Long term antibiotherapy was necessary and in some cases, replacement in situ can be realized in an one-step procedure or with only an excision of necrosis with drainage. ■

POSTER N° 82

PACEMAKER INFECTIONS : ARE WE FAMILIAR WITH THEM ?

Skiadas I, Giannitsioti E, Kanavos K, Antoniadou A, Zervopoulos G, Kalikantzaros I, Liagas G, Maragiannis G, Giamarellou H and the Hellenic Endocarditis Study Group
4th Dpt of Internal Medicine of Athens Medical School, Sismanoglio General Hospital, Athens, Greece

OBJECTIVE

To determine the clinical characteristics, difficulties in diagnosis and treatment of infections related to pacemaker implantation.

METHOD

From 1990 up to now, all patients managed at our center or included in our prospective endocarditis database with signs of a pacemaker (PM) infection were studied.

RESULTS

Twenty-one patients with pacemaker infections were recognized. Mean age was 70 years (range 49-89) and the male to female ratio was 1.6:1. In 16 patients definite or possible pacemaker endocarditis (by the Duke criteria modified for diagnosis of endocarditis on PM leads) was established and in 5 pocket infection was recognized. Twelve of the 16 PM endocarditis cases were bacteremic and in 3/4 culture negative the pathogen was isolated from the lead culture. Nine were definite by the Duke criteria (56 %) and transesophageal echocardiography (TEE) was positive in 75 %. PM endocarditis appeared early (< 6 months after implantation) in 63 % of cases and the majority presented with fever (81 %). In 3 cases (18 %) a concomitant pocket infection was present. Staphylococcus sp was the predominating pathogen (81 %) mostly (77 %) methicillin resistant. Treatment included surgical removal of the leads in 12/ 16 cases (75 %), mostly by traction (58 %) and it was 100 % successful with no in hospital mortality. All patients with pocket infection presented with local signs of infection and 2/5 had also low grade fever. Isolation of the pathogen was possible only in 2/5 cases where Staph. CNS was yielded. Treatment included removal of the leads in 3/5 cases and no overall failure or mortality was noted.

CONCLUSIONS

All bacteremic episodes in a patient with a pacemaker in place should be cautiously evaluated for PM endocarditis that can appear early post implantation. TEE has an important contribution increasing the sensitivity of diagnosis. Methicillin resistant Staphylococcus sp is the predominating pathogen in our setting and this should be considered in guiding antimicrobial prophylaxis during implantation. ■

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Elias Abrutyn (L, M)
Arnold Bayer (M)
Philipp Bosshard (L)
Anne Bouvet (L)
Chris Cabell (L)
Kwan-Leung Chan (L)
G. Ralph Corey (M)
Vinod Dhawan (L)
François Delahaye (M)
Robert Dion (L)
David Durack (L)
Xavier Duval (L)
Gebrine El Khoury (L)
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Manuel Fernandez-Guerrero (L)
Christa Gohlke-Bärwolf (M)
Erno Gutschik (M)
Gilbert Habib (L)
Bruno Hoen (M)
Dieter Hortskotte (L)
Édouard Kieffer (L)
Todd Kitten (L)
Catherine Leport (M)
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Olivier Lortholary (L)
Christelle Marquié (L)
José Miro (M)
Philippe Moreillon (L)
Élie Mousseaux (L)
Naomi O'Grady (L)
Yok Ai Que (L)
Ethan Rubinstein (M)
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James Steckelberg (M)
Daniel Stamboulian (L)
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