Clinical Manifestations of Infective Endocarditis

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Infective endocarditis is caused by microbial infection of the endocardium. Clinical manifestations come from systemic infections, intravascular lesions, immunological responses, and complications. However, this picture has changed dramatically in recent years.

We collected patients diagnosed with infective endocarditis, based on the Duke criteria, from May 1997 to May 2000 in our hospital. Clinical manifestations, risk factors, pathogens, the valve involved, and course of treatment were collected and analyzed.

There were 8 patients, 5 men and 3 women. Their ages ranged from 25 to 72 (mean 49.8 ± 13.7 years). Seven presented with fever, two with stroke and one with limb ischemia without fever. All had cardiac murmur and seven had leukocytosis. Five were diagnosed initially with infective endocarditis and 3 were diagnosed after serial examinations. Among the risk factors, five had valvular diseases, one had valvular replacement, one had a bicuspid aortic valve and one was an intravenous drug abuser. Streptococcus was obtained from 2, staphylococcus from 4 and 2 had negative cultures. Seven improved after treatment, and one deteriorated and died.

If a patient presents with fever, leukocytosis or other manifestations of infection, a history of valvular disease or drug abuse, the clinician should search for cardiac murmur. Infective endocarditis should be considered when there is metastatic emboli/infection or no primary infection focus can be found. Early diagnosis and treatment lead to mortality reduction.

Keyword: ***infective endocarditis, microbial pathogens***

Introduction

Infective endocarditis (IE) is a disease caused by microbial infection of the endocardium. Classical clinical manifestations come from systemic infection, intravascular lesions, immunological response, and complications[1]. However, this picture changed dramatically after the advent of antibiotic treatment, valve replacement, lifestyle changes, and other improvements in medicine[1-4]. The median age of patients has increased and there are more men than women with this problem. Acute presentation occurs more often than subacute or chronic presentations. Classic physical signs of advanced endocarditis such as Roth's spot, Osler's node, clubbing of fingers, and splenomegaly are seen less often nowadays. Etiologic organisms have changed significantly with the increased incidence of antibiotic

Accepted for publication: March 26, 2001
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resistance. Intravenous drug abuse, prosthetic valves and various conditions of immunocompromise have made the situation more complicated. Unfortunately, delayed diagnosis and inadequate treatment of IE still frequently occur. Updated information is therefore necessary for early diagnosis and adequate treatment of this disease.

Material & Methods

We collected patients diagnosed in our hospital from May 1997 to May 2000. All medical records were reviewed. Blood culture and echocardiography were performed in every suspected patient. Duke criteria were used to diagnose infective endocarditis[7]. Only those diagnosed in our hospital were enrolled and those who did not receive complete treatment or were lost to follow-up were excluded. Patient information, including presenting symptoms and signs, risk factors, pathogens, valves involved, course of treatment and prognosis, were collected and analyzed. The associated literature was reviewed.

Results

There was a total of eight patients (Table). Five were men and three were women. Their ages ranged from 25 to 72 years with a mean of 49.8 ± 13.7 years. Seven presented with fever, two with stroke and one with limb ischemia without fever. All had cardiac murmur and seven had leukocytosis. However, only two had the classic physical signs of petechiae, splinter hemorrhage and Janeway lesions. Five patients were diagnosed with infective endocarditis initially and the remaining three were diagnosed only after serial examinations. Among the risk factors, four had valvular diseases, one had valvular replacement, one had a bicuspid aortic valve and one was an intravenous drug abuser.

Staphylococcus was cultured from the blood in 4 patients and streptococcus was obtained from two. Two patients had negative cultures. Parenteral antibiotics were given as recommended and adjusted, if necessary, based on culture results and clinical responses to empiric antibiotics. Seven patients improved. However, one deteriorated and died.

Discussion

The treatment of infective endocarditis today is quite different than in the pre-antibiotic era because of the use of antibiotics, improvements in surgical treatment, the increase in intravenous drug abuse and the large number of immunocompromised patients[1-4]. The median age of patients has increased and there are more men than women with this disease. Acute cases have become more common and there has been a decrease in classic physical signs of advanced subacute bacterial endocarditis such as Roth's spots, Janeway lesion, clubbing of fingers, Osler's node, and splenomegaly. Only two patients in our series were found to have these lesions. Among microbial pathogens, the incidence of Streptococci has decreased but that of Staphylococci has increased. Gram negative bacilli, fungi and miscellaneous rare or unusual microbes are also identified and reported. More patients have prosthetic heart valves or have survived congenital heart disease because of improvements in surgery. Intravenous drug abuse has increased, too. There is also more concomitant IE in patients with compromised immunity.

Similar to other reports, most of our patients presented with mild illness. Fever, chills, general malaise, anorexia, weakness, myalgias, and arthralgias are often the only complaints. Leukocytosis, anemia, proteinuria, and elevated erythrocyte sediment rate, though common, are non-specific. It is difficult to diagnose this disease with these non-specific manifestations. The golden time is usually lost when complications such as heart failure, embolism, or mechanical complications occur[5-6]. Early diagnosis of IE cannot be over-emphasized.

Table Clinical information of patients with infective endocarditis

Age	Sex	Presenting symptom & sign	Laboratory Exam			Risk	Valve	Culture Result	Prognosis
			WBC	B+S*	Hb		Involoved		
25	M	Fever, Gr.III systolic murmur	17,330	75%	9.9	Drug addict	Tricuspid	Staphylococcus aureus	Improved
56	F	Fever, stroke, petechiae, limb ischemia, Gr.II systolic murmur, petechiae, splinter hemorrhage, Janeway lesion	20,300	88%	12.3		Aortic	Staphylococcus	Improved
49	M	Fever, Gr.III systolic murmur	13,470	72%	10.2	BAV, AR	Aortic	Staphylococci, coagulase (-)	Improved
60	M	Fever, Gr.II systolic murmur	14,690	82%	12.7	MR	Mitral	No growth	Improved
46	F	Fever, Gr.III systolic murmur	11,950	91%	9.0	AVR, MVR	Mitral	Staphylococci, coagulase (-)	Improved
72	F	Fever, Gr.III systolic murmur	7,700	85%	11.4	MR	Mitral	Streptococcus viridans	Improved
44	M	Fever, CHF, stroke, spleen/kidney infarct, Gr.II systolic murmur	15,350	81%	9.1	DM, MR	Mitral	Streptococcus viridans	Deteriorated and died
46	M	General weakness, limb ischemia, Gr.II systolic murmur, petechiae, splinter hemorrhage, Janeway lesion	34,450	91%	6.5	MR	Mitral	No growth	Improved

B+S*: Band + Segment

BAV: Bicuspid aortic valve; AR: Aortic regurgitation; MR: Mitral regurgitation; AVR: Aortic valve replacement; MVR: Mitral valve replacement; DM:

Positive blood culture constitutes one of the major criteria of diagnosis. However, it takes several days before results are available. Echocardiography is quite useful in detecting endocardial involvement, another major criteria of diagnosis, and in assessing complications and treatment responses[9-10]. Transesophageal echocardiography is much better than transthoracic echocardiography in selected cases[11-12]. If a patient presents with infection, a history of valvular disease or intravenous drug abuse, the clinician should search for a cardiac murmur. Echocardiography should be performed if there is any suspicion of IE. Infective endocarditis should be considered and treated even without direct evidence, especially when there is absence of a primary foci of infection or presence of metastatic focus of emboli or infection.

Infective endocarditis carries a significant risk of death even with good management. Treatment aims to eradicate the infective microorganism and it should be provided as soon as IE is suspected. Various antibiotics regimens are available[13-14]. Further adjustment should be based on clinical response and microbial cultures. About one third of patients required surgery and good timing is essential[15-16]. Moderate or severe heart failure unresponsive to medical treatment, valvular obstruction, periannular or myocardial abscess, prosthetic valve dehiscence, persistent bacteremia despite appropriate antibiotics and fungal infection are the major indications for surgery. Relative indications include recurrent emboli, infections caused by staphylococcal and gram-negative bacilli, especially involving a prosthetic valve, persistent fever despite treatment and vegetations enlarging during treatment[17-18].

Infective endocarditis is always fatal if untreated. Young patients early diagnosis and treatment, solitary involvement of a prolapsing mitral valve and penicillin-sensitive streptococcal infection carry a favorable prognosis[19-20]. Heart failure, central nervous system complications, renal failure, gram-negative bacillary or fungal infection, negative culture, prosthetic valve infection, and development of ab-

scess in the valve ring or myocardium indicate a poor prognosis[21-23].

Our study was limited because of the number of cases and retrospective design. Further studies with pooling of patients from multiple centers in different areas of our country, and perhaps with a prospective study design, may disclose the current manifestations of this old disease.

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感染性心內膜炎的臨床表現

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感染性心內膜炎乃因微生物感染了心內膜所造成之疾病，臨床上的表現以全身性感染、血管內病變、免疫反應以及併發症爲主。近年來因爲醫學的進展及生活的變遷，這疾病的表現已經與昔日有相當的差異。要正確地診斷與治療這疾病，就必須要跟得上時代。

我們收集了自1997年五月至2000年五月期間，本院診治所有感染性心內膜炎的患者。唯有在本院診斷、且接受完整的治療與追蹤者，方得納入此研究。並就這些患者的臨床表現、危險因子、致病病原、瓣膜變化以及治療過程加以整理分析。

整理後得到八位患者，五男三女。年齡從25歲到72歲(49.8±13.7)。這些患者中，七位因爲發燒而來就診，兩位中風，另外一位則因肢體缺氧而來就診。他們的心臟都有雜音，七位患者血中白血球上升。五位患者一開始就被疑爲感染性心內膜炎，另外三位則是經過一系列的檢查才得到診斷。這些患者中，五位已知有心臟瓣膜疾病，一位曾接受過人工瓣膜換置手術，一位有先天性二瓣性主動脈瓣，另一位則是靜脈藥癮者。血液細菌培養長出鏈球菌的有兩位，葡萄球菌的有四位，另外兩位則未長出細菌。經過治療，七位患者改善，一位患者則持續地惡化最後死亡。

感染性心內膜炎患者的表現與以前已經大不相同。如果您的患者因發燒、白血球增加或其他感染的跡象而來就診，您務必仔細地詢問有無心瓣膜疾病或是靜脈藥物使用的病史，理學檢查時也必須仔細聆聽有無心雜音。如果患者有散播性栓塞、感染，或是初步檢查找不出感染源者，最好愼重地考慮是否染有感染性心內膜炎。即時的診斷與治療，是成功治療感染性心內膜炎及減少損傷的不二法門。

關鍵詞：感染性心內膜炎，微生物病原

接受刊載：90年3月26日
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