

Acute infective endocarditis in elderly woman visiting Ayub Medical Institute with history of dental procedure: A case report.

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Abstract – Infective endocarditis is a fatal, disastrous, and lethal disease and can lead to death if not diagnosed and treated immediately. This disease stereotypically affects the cardiac valves and the most commonly involved valve is the tricuspid valve, but the mitral and aortic valves can also be convoluted. Infective endocarditis produces both intra cardiac effects e.g., valvular inadequacy and a great variety of systemic effects, both from emboli which could either be sterile or infected and a variety of immunological mechanisms. Infective endocarditis is a disease that can easily be misdiagnosed and the physicians should be alert, vigilant with all the abilities to maintain the attention in manifestations of considering infective endocarditis to avoid missing the diagnosis. Here is a case report of a 55 years old woman who presented to the emergency department of Ayub Medical Institute, Abbottabad, Pakistan with history of high grade fever for last 5 days [103⁰ at time of visiting in hospital's emergency department], sinus tachycardia with the heart rate of 115 beats/minute, body aches and pains and sudden onset of shortness of breath and chest pain. She also had history of some dental procedures about three weeks back. In this patient blood sampling was done. Three sets of blood samples prior to start of antimicrobial treatment, were collected and then sent to laboratory for the culture to isolate the causative or involved organism. The result was; isolated organism was *Streptococcus Viridan* was isolated on culture. Blood investigations revealed; *Streptococcus Viridan* was screened following culture, CRP which was raised up to 230, raised ESR up to 60, leucocytosis characterized by a TLC of 16800/cc, Hb 7.5mg/dl. An immediate and aggressive treatment was started with Ceftazidime 1g intravenously 8 hourly which was later switched to Ceftriaxone 1g along with Vancomycin 1.5g intravenously every 12 hours until the fever was subsided and CRP was reduced to 10. Following a treatment plan that spanned over fourteen days and after the settlement of the fever and other symptoms, the patient was discharged on prescription of antibiotics. It is concluded that Ceftriaxone and Vancomycin have proven better treatment strategies than the commonly prescribed antibiotics as given in European's treatment guidelines.

Keywords – Endocarditis, Dental Procedure

1. Case Report

It would not be quite an easy job for one to make a proper diagnosis, such patient needs more than a casual attention by the physicians by thoroughly examining the patient systemically. Cardiac causes should be well-thought-out such as infective endocarditis if there is no significant cause of fever is being found.

A classical finding in infective endocarditis is a Murmur [abnormal heart sound] which is heard on auscultation when a watchful cardiovascular examination is carried out, when such murmur and history of fever are found together than suspicion for the infective endocarditis should be high and immediate measures for echocardiography should be taken to see for the vegetation intracardially and then immediate shifting of patient to cardiac care unit as soon as possible and start of the antimicrobial treatment along with the supportive treatment and also start for all the base line investigations.

A 55 years old female was brought to the emergency department of Ayub Medical Institute with history of flu like illness, low grade fever initially for 4 days and high grade fever for last 5 days, body aches and pains, anorexia, weight loss, night sweating, anaemia, abdominal symptoms like cramps, nausea, vomiting, an episode of unconsciousness the

same day, sudden onset of chest pain and shortness of breath.

General physical examination at the time of presentation revealed: significantly high temperature i.e. 103⁰F, blood pressure was recorded as 100/60 mm of Hg, tachycardia with high pulse rate of 115 beats/minute, respiratory rate of 27/minute, oxygen saturation on pulse oximetry was 96%, pupil were reactionary.

Following detailed questioning with the son of the patient, it was reported that the subject had a dental procedure about three weeks back, there was an abscess found on the right side of the gums [gingivitis]. After thorough cardiovascular examination, starting from the tip of the fingers it was found to have Osler's nodes on the tip of the fingers more prominent on right hand and a clear murmur heard on auscultation which was making the stronger suspicion about the infective endocarditis, immediate echocardiography was done and the vegetation on the posterior mitral valve were seen prominently.

The laboratory blood tests showed raised total leucocyte count of 16800/dl, and Hb of 7.5 mg/dl, raised ESR up to 60, CRP was 230 [normal <6]. Other routine investigations were done with normal kidney and liver functions, HIV, HBV and HCV screening was done and found negative for all. Chest X.

Ray revealed very little pulmonary oedema. Furthermore, ECG was done and there was tachycardia.

The patient was admitted to cardiac care unit and antimicrobial treatment along with supportive therapy initiated immediately. Before starting antimicrobial treatment blood samples were taken and sent to the laboratory for culturing and isolation of the organism involved. It is important and necessary to mention here that an aggressive treatment was started regardless of the waiting for the results of the blood cultures with Cefazidime 1g intravenously 8 hourly [after test dose] for 3 days which was later switched to Ceftriaxone and Vancomycin 1.5g intravenously every 12 hours and continued with the same antibiotics until the fever was subsided and blood CRP was reduced to 10 [normal >6] Two days after the settlement of the fever the patient was discharged on oral medications with advise of a regular follow up every week.

1.1. Etiology

Most common organism causing infective endocarditis is *Staphylococcus aureus* most common with prosthetic valves, acute infective endocarditis and infective endocarditis related to intravenous drug abusers [4], *Staphylococcus Aureus* is an aggressive organism or pathogen and bacteraemia with this organism leads to the involvement of the cardiac valves potentially hence causing infective endocarditis [5]. *Streptococci Viridan* 50 to 60 % [commonly in dental procedures], *Group D Streptococci*, *Streptococcus intermedius*, *Group B Streptococci*, *Pseudomonas Aeruginosa*, *HACEK organisms [including: Haemophilus spp., Actinomycetemcomitans, Cardio bacterium Spp., Eikenella Corrodens, Kingella Kingae], Enterococci and fungi* [1, 2].

Table 1. Cardiac conditions in which antimicrobial prophylaxis is indicated

- Prosthetic heart valves
- Complex congenital cyanotic heart diseases
- Previous infective endocarditis
- Surgically constructed systemic or pulmonary conduits
- Acquired valvular heart diseases
- Mitral valve prolapse with valvular regurgitation or severe valve thickening
- Non-cyanotic congenital heart diseases including bicuspid aortic valves Hypertrophic myopathy

Table 2. Diagnostic and therapeutic interventions likely to produce bacteremia [1]

- Bronchoscopy [rigid instrument]
- Cystoscopy during the urinary tract infections
- Biopsy of the urinary tract/prostate
- Dental procedures with the risk of gingival/mucosal trauma Tonsillectomy and adenoidectomy
- Esophageal dilation/sclerotherapy
- Instrumentation of the obstructed biliary tracts
- Transurethral resection of prostate
- Urethral instrumentation/dilation
- Lithotripsy Gynecological procedures in presence of the infections.

1.2. Diagnosis

In this patient the two major criteria [Duke’s Criteria] were fulfilled with bacteraemia [raised CRP and TLC] and vegetation seen on posterior mitral valve which were enough to confirm the diagnosis.

Diagnosis of Infective Endocarditis are presently made on the Duke’s Criteria established first in 1994 which was later on modified and revised in 2000. The two major criteria are the bacteraemia and the vegetation on the endocardium, which can be seen by an echocardiography.



The minor criteria includes predisposing heart diseases, fever, septic or sterile emboli, or immunologic phenomena [e.g., positive rheumatoid factor, glomerulonephritis].

The classical physical findings include Osler’s nodes, Splinter haemorrhages and Roth spots are rarely seen but highly significant.

1.3. Treatment

In this patient the emergency treatment was started aggressively with broad spectrum antibiotic Cefazidime 1g intravenous 8 hourly which was later switched over to Ceftriaxone 1g and Vancomycin 1.5g intravenously 12 hourly, supportive treatment was also given with intravenous fluids, multivitamins and paracetamol infusions.

Infective Endocarditis is generally treated with bactericidal antibiotics, given intravenously for the first the first two 2 weeks and by mouth for a further of 2 to 4 weeks. While awaiting for the results of the blood cultures, a combination of intravenously benzyl penicillin and gentamicin is given unless staphylococcal endocarditis is suspected, when vancomycin should be substituted for penicillin. Subsequent treatment depends on the results of the blood cultures and the antibiotic sensitivity of the organism. Antibiotic doses are adjusted to ensure adequate bactericidal activity [1].

Surgery to replace the valve should be considered when there is severe heart failure, early infection of prosthetic material, worsening renal failure and extensive damage to the affected valve [1].

Prophylaxis

The patients who are at the risk of suffering from infective endocarditis should receive the antibiotic therapy before undergoing a procedure likely to result in bacteraemia, the choice of antibiotic depends on the procedure which include bronchoscopy, dental procedures, after tonsillectomy and adenoidectomy, while taking biopsies from urinary tract,

cystoscopy during acute urinary tract infections, lithotripsy, oesophageal dilation, gynaecological procedures in presence of an infection, urethral instrumentation and dilation, and instruments induction in biliary tract.

The prophylactic antibiotics are given according to the procedures which are amoxicillin, clindamycin, azithromycin and clarithromycin given about one hour before any dental, oral, respiratory or oesophageal procedures, whereas ampicillin or amoxicillin plus gentamicin given one hour before genitourinary and gastrointestinal tract procedures.

Prognosis

The ultimate result of the right sided Methicillin Sensitive Staphylococcal Aureus causing infective endocarditis is comparatively better and its mortality rate is not so much high and is < 5%. Left sided infective endocarditis especially when the aortic valve is involved and complicated infective endocarditis have the worst consequences and penalties and the mortality rate is higher which is >20 to 30% [4]. Gram negative bacilli and fungus tend to have poorer penalties or outcomes. Furthermore, severe sepsis, systemic septic embolization and multi organ failure increase the risk of death [1, 3].

2. Discussion

In this case report study we have shadowed a patient who presented in emergency department of Ayub Medical Institute, Abbottabad, Pakistan with established history of infective endocarditis having dental procedure about three weeks back and then advancement of the infection to such an extent that it led to bacteraemia and ultimately grew infective endocarditis with clear vegetation on echocardiograph and high grade fever of 103⁰ F, tachycardia with elevated heart rate up to 115 beats/minute and the rhythm of the pulse was fluctuating with breathing i.e., Sinus tachycardia, respiratory rate of 27/minute, chest pain and sudden onset of shortness of the breath and also had an episode of faint because of which the patient was brought to emergency department,

The patient has been treated in the village Basic Health Unit with antibiotics about four days before she came to hospital that's why the treatment started in CCU was aggressive and regardless of the culture results as it can mislead the results if the patient has taken antibiotics recently and the culture may be negative. So that was the reason that the treatment was started with broad spectrum cephalosporins which have a very broad spectrum for organisms' coverage or antimicrobial activity.

The sensitivity of blood culture is over 90% if they are sent earlier before the antimicrobial treatment is started. But it often happens that patient may be misdiagnosed and being given antibiotics on the basis of wrong diagnosis made due to poor diagnostic facilities in peripheries at primary health care centres i.e., Basic Health Units in the peripheries. There may be two reasons if the bacterial culture is negative; either the patient is already receiving an antimicrobial treatment or there may be involvement of other organisms which cannot be isolated on culture and these organisms include Coxiella, Bartonella, Legionella and HACEK organisms especially in patients with prosthetic valves, immune compromised patients and patients installed with pace makers. Culture

negative infective endocarditis is diagnosed by modified culture conditions, serology and advanced molecular techniques [1, 2, 3].

Different conditions complicate and chip in the development of the infective endocarditis, some are the invasive procedures usually done for diagnostic and for therapeutic purposes as well e.g., transthoracic bronchoscopy, endoscopy, urethral instrumentation, tonsillectomy, adenoidectomy, while taking biopsies from urinary tract and cystoscopy during acute urinary tract infection, dental procedures, lithotripsy and esophageal dilatation [1, 2].

Before performing all the procedures appropriate prophylactic measures are taken by giving antibiotics prior to start of the procedures usually one hour before the procedure [1, 3].

Also in intravenous drug abusers the individuals get infected by using same needles by multiple abusers at the same time. Most of the IDUs acquire Methicillin resistant staphylococcus aureus and streptococci viridan whereas less commonly with enterococci and fungi [4]. Another condition: Atopic Dermatitis is a skin infection mostly caused by staphylococcus aureus, the infective endocarditis in such patients could be due to the result of frequent staphylococcal bacteraemia in patients with atopic dermatitis [5].

Recommendations

It is recommended that infective endocarditis can better be treated with Ceftriaxone and Vancomycin, however, the proposed medical regime lies against the commonly prescribed antibiotics as given in European's treatment strategy.

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