

Infective Endocarditis In India: A Broad Picture Of A Very Large Country

Endocardite Infecçiosa na Índia: Um Panorama de um País Enorme

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*Everything is recycled in India,
Even dreams
Shashi Tharoor*

Infective endocarditis (IE) has always been challenging for the medical field, which has responded with newer innovations and persistent efforts. Habib et al. stated "Infective endocarditis is still a life-threatening disease with the frequent lethal outcome despite profound changes in its clinical, microbiological, imaging, and therapeutic profiles"¹.

Various factors affect the different aspects of IE diagnosis and management. As a developing country, India has a very polar healthcare delivery system. Primary health centers range from basic facilities that provide very primary level healthcare in rural areas to center of excellence hospitals that offer the latest medical innovations in metropolitan areas. The crucial point is the time it takes for a patient to reach to suitable center to receive the appropriate interventions. In particular, the diagnosis of IE by primary healthcare physicians must be obtained as soon as possible. Socio-economic factors play a pivotal role in patient outcomes. All three of these issues pose great challenges, especially in very large countries like India. Sengupta et al. concluded that socio-economic factors influence the clinical profile of patients presenting with IE worldwide², leading to delayed diagnosis and lower use of surgery². Gupta et al. reported observations about IE such as increasing patient age and increased proportions of patients without a history of cardiac ailments, better cultural positivity rates, an increasing incidence of staphylococcal infections, increased usage of transesophageal echocardiography (TEE), and increasing elective surgery rates³.

Gupta et al. summarized the risk factors for IE as a longer lifespan contributing to degenerative heart disease and the risk of immune suppression due to diabetes, human immunodeficiency virus, immunosuppressive drugs, and intravenous drug abuse⁴.

Various procedures require invasive instruments for the gastrointestinal and genitourinary tracts, arteriovenous fistula for dialysis, pacemaker and defibrillator implantation, and immunosuppressive therapy⁴. Few cases (10–15%) reportedly required healthcare intervention⁵ than IE due to rheumatic heart disease⁴.

Fever, heart murmur, and splenomegaly should be considered highly suggestive of IE and lead to its early diagnosis⁴.

The clinical presentation can vary but most often includes the following (in order of most common to least common): fever, chills or sweating, shortness of breath with a history of loss of appetite or weight, chest pain, and peripheral edema⁶.

The microbiological profile involves a wide spectrum of species including staphylococci, streptococci, enterococci, *Streptococcus gallolyticus*, *Streptococci viridians*, *Streptococcus sanguis*, *Streptococcus bovis*, *Streptococcus mutans*, *Streptococcus mitis*, and others such as *Coxiellaburnetii*, *Legionella* spp., *Chlamydia*, *Mycoplasma* spp., *Streptobacillus moniliformis*, *Salmonella* spp., *Brucella* spp., *Bartonella* spp., *Tropheryma whipplei*, *Pseudomonas aeruginosa*, and the HACEK group (*Haemophilus*, *Aggregatibacter*, *Cardiobacterium*, *Eikenella*, and *Kingella*)^{1,4}.

After an 11-year study, Navneet et al. concluded that predominant sites affected by IE include the tricuspid valve, followed by the mitral valve and the aortic and pulmonary valves⁶. Multivalvular involvement is also encountered. Vegetations are commonly 10–30 mm in diameter⁶. Blood cultures using modified Duke's criteria and two-dimensional echocardiography/TEE/transthoracic echocardiography (TTE) remain the principal diagnostic modalities. However, culture positivity rates vary widely nationwide (30–70%)^{7,8}. Different non-invasive techniques such as multi-slice computed tomography, magnetic resonance imaging, and nuclear imaging such as ¹⁸F-fluorodeoxyglucose positron emission tomography are gaining popularity¹. Echocardiography can be useful for predicting complications based on vegetation size, mobility, extent, and consistency⁴. TTE is the procedure of choice⁹. TEE is better in cases of prosthetic valves since its image quality is superior due to higher transducer frequency and no interference of lung tissue⁹. Abscesses, vegetations, and destructive lesions are the anatomical features and main findings of IE on echocardiography¹⁰. Polymerase chain reaction (PCR) amplification of prokaryotic 16S rDNA (recombinant deoxyribonucleic acid) is helpful for demonstrating the presence of bacteria within the heart valve⁴. Newer PCR techniques include nested PCR, real-time PCR, and LightCycler technology¹¹, but the above techniques are not readily available or cost-effective in developing countries.

Medical management consists of various regimens including injectable vancomycin, gentamycin, ceftriaxone, nafcillin, oxacillin, cefazolin, and rifampin, which are used according to the organism isolated in culture. An increasing trend in surgical intervention is aiming to lower mortality rates. Shock, congestive heart failure, and staphylococcal endocarditis are associated with a higher mortality risk in India⁷ as well as other parts of the world^{8,12}. The disease profile of patients is shifting from young patients with rheumatic heart disease to those with prosthetic valves or underlying valvular disease⁷.

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Artigo recebido em 5/3/2022; revisado em 5/15/2022; aceito em 5/25/2022

DOI: 10.47593/2675-312X/20223502eed_15



Surgical management and timing are crucial in IE. Indications for surgery are heart failure, uncontrolled infection, and embolism risk¹³. Two major societies, the European Society of Cardiology (ESC) and the American Heart Association (AHA)/American College of Cardiology (ACC), agree on these indications but differ in some areas. The ESC proposes urgent/emergent versus elective surgery, whereas the ACC/AHA recommends early surgery before antibiotics are stopped¹³. Surgery is recommended by the ACC/AHA for vegetations >10 mm versus by the ESC for those >30 mm¹³.

The biggest challenge in the Indian subcontinent is obtaining sterile blood cultures since tested patients have likely already received antibiotics from their primary care physicians. Around 2.5–31% of cases in India are blood culture–negative IE due to the

use of antibiotics before diagnosis and poor adherence to blood culture guidelines⁴. Strong suspicion, correlation between clinical findings and the history and work-up leads to early detection and better outcomes. Thus, the need for microbiology labs and echocardiography facilities across India for early detection is crucial. The second hurdle is a reluctance to receive surgical intervention; however, in-depth counseling can remedy this barrier. This response has ramped up in India over the past few decades. Early suspicion leads to early detection is seen, and increases in medical and surgical interventions are helping fight IE.

Conflict of interest

The author declares no conflicts of interest.

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