



RESEARCH ARTICLE

SUB ACUTE HAEMOPHILUS PARAINFLUENZAE ENDOCARDITIS: A CASE REPORT AND REVIEW OF LITERATURE

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Abstract

Haemophilus species are an infrequent cause of subacute bacterial endocarditis. They are fastidious Gram-negative bacteria belonging to the oropharyngeal microflora, and are slow-growing; their growth is enhanced by the presence of carbon dioxide. Herein, we describe the case of a 19-year-old male with no relevant medical history who was admitted for fever and general symptoms and was found to have sub acute native mitral endocarditis secondary to *H. parainfluenzae*. He underwent successful mitral valve repair with good long term outcomes. This case also highlights the ability of a rare bacterium, *Haemophilus parainfluenzae*, to cause a sub acute septic process and multiple complications including septic emboli. Early identification of this bacterium from blood cultures and early transoesophageal echocardiography is essential for obtaining the diagnosis and allowing early start of adequate treatment.

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Introduction:-

Haemophilus parainfluenzae is part of group of microorganisms collectively known as HACEK including *Haemophilus* ssp, *Actinobacillus actinomycetemcomitans*, *Cardiobacterium hominis*, *Eikenella corrodens* and *Kingella kingae*.

They are fastidious Gram-negative bacteria belonging to the oropharyngeal microflora, and are slow-growing; their growth is enhanced by the presence of carbon dioxide. (1)

It counts for almost 3% (0.8–6%) of the total endocarditis cases and characterized by a sub acute course, a large vegetation and high probability of embolization. The involved valve is native in most patients and the common site of the infection is the mitral valve. (2)

The treatment of choice is a third-generation cephalosporin (ceftriaxone), which leads to a favorable outcome in the 80–90% of cases, with or without cardiac surgery. (3)

Herein, we describe the case of a 19-year-old male with no relevant medical history who was admitted for fever and general symptoms and was found to have sub acute native mitral endocarditis secondary to *H. parainfluenzae*. He underwent successful mitral valve repair with good long term outcomes.

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Case report:-

19-year-old, man was admitted with a high-spiking fever accompanied by myalgias, asthenia, diarrhea, he also complained of sore throat 5 days earlier, and denied having any rashes, lower extremity swelling, or dyspnoea. The symptoms started 15 days earlier.

He had no history of congenital cardiac disease, or rheumatic fever. He had never smoked or used intravenous drugs. He did not report any dental-related disease in the recent past.

On clinical examination, his temperature was 38.8°C, and his vital signs were within normal limits (respiratory rate: 16 breaths/min, SpO₂: 97% on air, heart rate: 111 beats/min, blood pressure (BP): 120/60 mmHg). Cardiovascular exam revealed no murmur or gallop. Pulmonary, abdominal and clinical exams detected no abnormalities. Nuchal rigidity was absent and there were no focal neurologic deficits. Examinations of the oropharynx and skin, including the palms, soles, and nails, were normal.

ECG showed sinus tachycardia with no ST segment changes and a normal PR interval. The chest Xray was normal.

His complete blood profile revealed a total white blood cell count of 11,100 cell/mm³ and a differential count of 7.3 neutrophils/mm³ (70%) and 941 lymphocytes/mm³ (15%). Platelets were 335,000/mm³, and the hemoglobin levels were 14 g/dl. Liver function tests were normal. The C-reactive protein level was 350 mg/l. The renal function, coagulation profile, cardiac enzymes, and hepatitis screen were all within normal limits. A urine dipstick was negative with no nitrites, red cells or leucocytes. Three sets of blood cultures were obtained.

Abdominal CT scan showed moderate hepatosplenomegaly with multiple splenic infarcts.

Immediately following the CT scan results, and upon strong suspicion of cardiac embolism causes leading to splenic embolization, transthoracic echocardiography (TTE) was performed, revealing a 23x18mm heterogeneous, round mass attached to the medial mitral annulus, mobile into the left atrium of the mitral valve, and demonstrated slight thickened mitral leaflets with mild to moderate mitral valve regurgitation.

A subsequent transesophageal echocardiogram (TEE) confirmed the same findings as TTE, and didn't show any abnormalities in the left and right cavities or any vegetation in the other valves.

Cerebral magnetic resonance imaging showed several hyperintense punctate lesions in FLAIR and diffusion imaging which were suggestive of septic microemboli.

Although Duke's criteria were met; treatment for infective endocarditis was started. As the patient had reported having a penicillin allergy, Daptomycin and Gentamycin were started empirically treatment of possible bacterial infectious endocarditis.

Four days into the admission, blood cultures grew pansensitive *H. parainfluenzae*. At this point, the Infectious Diseases team narrowed the antibiotic regimen from Daptomycin and Gentamycin to ceftriaxone 2 g intravenous daily.

The presence of mitral native valve endocarditis with large vegetation of 23mm and embolic episodes prompted us to offer the patient surgical intervention.

Then, our young patient underwent mitral valve repair that consisted of resection of the vegetation as well as the affected part of the leaflet then replacing them with an autologous pericardium patch in addition to mitral annuloplasty.

The culture of the resected tissue was positive to *Haemophilus parainfluenzae*.

Following valve reparation, antibiotic therapy was continued. His blood cultures cleared, Ceftriaxone was administered, uneventfully, for six more weeks.

At discharge, no apparent signs of neurological sequelae or cardiac symptoms were evident.

At follow-up 4 weeks after surgery, he was back to his baseline health, and the echocardiographic control achieved a satisfactory final result in absence of major complications.



Figure 1:- Transesophageal echocardiogram, section at 60 degrees, with the view of the vegetation in small mitral leaflets.

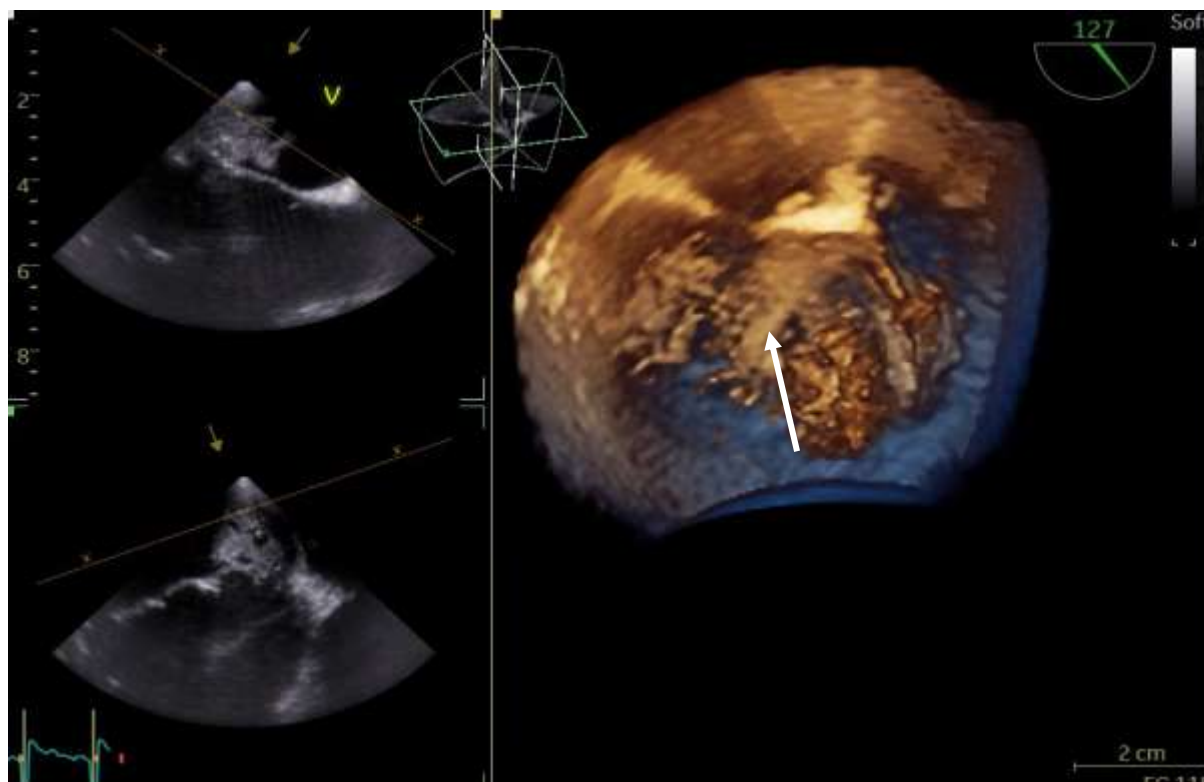


Figure 2:- A 3-dimensional transthoracic echocardiogram section at 120 degrees, with the view of the vegetation.



Figure 3:- Echocardiogram parasternal long-axis view showing the mitral valve vegetation.



Figure 4:- Echocardiogram four-chamber view showing the mitral valve vegetation.

Discussion:-

Haemophilus parainfluenzae is a pleomorphic, fastidious, gram-negative coccobacillus that is part of the human genitourinary and oropharyngeal microbiota. It is one of the HACEK group, that require X and V factors for growth as well as CO₂ and it is responsible for 0.5% of total endocarditis cases and 36% of HACEK endocarditis cases (5).

Our patient's case summarizes some common features found after a review of the literature in patients who are infected by *Haemophilus parainfluenzae* endocarditis.

These common features concerned young patients with no history of cardiac disease (6), the mitral valve is a common site of infection, and the vegetations are classically large and have a high risk of vascular/ immunological manifestations such as stroke embolization. (7)

HACEK endocarditis is usually found in 20% of patients with poor dentition, furthermore, dental procedures and nasopharyngeal infections have been also described as risk factor of developing endocarditis in HACEK group (8).

In our patient's case, the progression of infective endocarditis was over 2 weeks, with symptoms consistent with fever and general symptoms. The episode of pharyngitis was the only risk factor found, he was free of previous heart disease, he did not undergo any dental procedure before hospital admission, and his oral health was good within the examination, furthermore the CT scan didn't find any radiological sign of sinusitis.

The clinical presentation is generally sub-acute. In view of the fact that *H parainfluenzae* is typically a slow growing organism, with a mean growth time of 6.3 days in cases of left-sided infection and 8.5 days in cases of right-sided infection (9). In our case blood cultures grew *H parainfluenzae* in four days.

The rapid speciation in cultures and the presence of embolic complications may be explained by a high bacterial inoculum and the large mobile vegetation.

Accordance with the international guidelines, the treatment of choice is a third-generation cephalosporin (ceftriaxone), which leads to a favorable outcome in the 80–90% of cases, with or without cardiac surgery (10)

The patient was successfully managed first with intravenous antibiotics that included Ceftriaxone. Therapy usually involves 4 weeks of intravenous antibiotics in native valve endocarditis and 6 weeks in prosthetic valve endocarditis (11)

Per the European Society of Cardiology (ESC) guidelines, the presence of mitral native valve endocarditis with large vegetation > 10mm and embolic episodes (splenic and cerebral emboli in our case) prompted us to offer the patient surgical intervention. (12)

Nevertheless, *Haemophilus* endocarditis in adults has a favorable prognosis, despite the frequent need for surgery during the acute stage

Conclusion:-

H. parainfluenzae is a rare, but significant cause of endocarditis, and its onset is usually subacute but may also be encountered in acute endocarditis. It causes often peripheral occlusive disease due to its tendency for large vegetations.

The Antibiotic therapy should be initiated quickly if the diagnosis of endocarditis is considered and early surgical intervention must to be considered for patients with significant embolic risk.

References:-

- (1) Das M, Badley AD, Cockerill FR, Steckelberg JM, Wilson WR: Infective endocarditis caused by HACEK microorganisms. *Annu Rev Med* 1997, 48:25-33.
- (2) Chambers ST, Murdoch D, Morris A, et al. HACEK infective endocarditis: characteristics and outcomes from a large, multi-national cohort. *PLoS One*. 2013;8(5):e63181.
- (3) Revest M, Egmann G, Cattoir V, Tattevin P. HACEK endocarditis: state-of- the-Art. *Expert Rev Anti Infect Ther*. 2016;14(5):523-530.
- (4) Koneman EW, Allen SD, Janda WM, Schreckenberger PC, Winn WC Jr. *Color atlas and textbook of diagnostic microbiology*. 5th ed. Philadelphia: Lippincott-Raven, 1997:363–472.
- (5) T. Chambers, D. Murdoch, A. Morris et al., "HACEK infective endocarditis: characteristics and outcomes from a large, multinational cohort," *PLoS ONE*, vol. 8, no. 5, Article ID e63181, 2013.
- (6) Limonta S, Cambau E, Erpelding M-L, et al. Infective endocarditis related to unusual microorganisms: a prospective population-based study. *Open Forum Infect Dis* 2020;7:ofaa127.

- (7) Chambers ST, Murdoch D, Morris A, Holland D, Pappas P, et al. (2013) HACEK Infective Endocarditis: Characteristics and Outcomes from a Large, Multi-National Cohort. PLoS ONE 8(5): e63181.
- (8) C. Darras-Joly, O. Lortholary, J.-L. Mainardi, J. Etienne, L. Guillevin, and J. Acar, "Haemophilus endocarditis: report of 42 cases in adults and review," *Clinical Infectious Diseases*, vol. 24, no. 6, pp. 1087–1094, 1997.
- (9) Jemsek JG, Greenberg SB, Gentry LO, Welton DE, Mattox KL. *Haemophilus parainfluenzae* endocarditis: two cases and review of the literature in the past decade. *Am J Med* 1979;66:51-7.
- (10) GGrace M. Auten, Charles S. Levy, Margo A. Smith, *Haemophilus parainfluenzae* as a Rare Cause of Epidural Abscess: Case Report and Review, *Reviews of Infectious Diseases*, Volume 13, Issue 4, July 1991, Pages 609–612.
- (11) L. M. Baddour, W. R. Wilson, A. S. Bayer et al., "Infective endocarditis in adults: diagnosis, antimicrobial therapy, and management of complications: a scientific statement for healthcare professionals from the AmericanHeart Association," *Circulation*, vol. 132, no. 15, pp. 1435–1486, 2015.
- (12) Gilbert Habib, Patrizio Lancellotti, Manuel J Antunes, et al. ESC Scientific Document Group, 2015 ESC Guidelines for the management of infective endocarditis: The Task Force for the Management of Infective Endocarditis of the European Society of Cardiology (ESC) Endorsed by: European Association for Cardio-Thoracic Surgery (EACTS), the European Association of Nuclear Medicine (EANM), *European Heart Journal*, Volume 36, Issue 44, 21 November 2015, Pages 3075–3128.