**CASE REPORT**

**Granulicatella adiacens** infective endocarditis complicated with splenic infarct in pregnancy: A case report and literature review

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**ABSTRACT**

Infective endocarditis (IE) contributes to high morbidity and mortality due to therapeutic challenges despite of advances in treatment options. The epidemiology, clinical manifestations, complications, diagnostic difficulties and dilemmas, suitable timing for surgery were constantly changing and leading to poor prognosis of this illness. We report a case of *Granulicatella adiacens* infective endocarditis complicated with embolism and splenic infarct in a pregnant lady with chronic rheumatic heart disease successfully treated with antimicrobial therapy and surgical intervention.

**Key words:** G. adiacens, Infective Endocarditis, Splenic Infarct, Pregnancy

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**1. INTRODUCTION**

*Granulicatella adiacens* is a member under nutritionally-variant streptococci (NVS). It requires media supplemented with pyridoxal for growth as most commonly used laboratory media are incapable to support the growth of NVS. A report of 76 cases from
2000 until 2015 showed that infective endocarditis (IE) caused by NVS is more prevalent than IE caused by a group of other virulent organisms called HACEK, which includes Haemophilus, Aggregatibacter, Cardiobacterium, Eikenella, and Kingella organisms and approximately one-tenth of IE are caused by viridans group streptococci (VGS). We describe a case of G. adiacens IE patient with underlying chronic rheumatic heart disease complicated with splenic infarction and the review of literature.

2. CASE REPORT

A 33-year-old, gravida 4, para 3 lady, at 12 weeks period of gestation, was known to suffer from underlying chronic rheumatic heart disease and moderate mitral regurgitation for 17 y of age. She presented to our hospital with left sided chest pain for one day duration. The chest pain was pricking in nature, radiated to her back and it was associated with shortness of breath, palpitations and sweating. She was hypotensive. Other vital signs were stable. A pansystolic murmur radiating to the axilla was heard; with no pedal edema seen. Other systemic examinations were unremarkable. Echocardiography revealed ejection fraction of 72% with dilated left atrium, both mitral valves thickened, severe mitral regurgitation and a vegetation measuring approximately 0.5-0.6 cm in size. She was diagnosed to have acute severe rheumatic carditis and IE as differential diagnosis. She was started with intravenous penicillin G 2 mega unit 4-hourly. The antibiotic was changed to IV ceftriaxone 2 G daily by gynecology team a day later to cover for Gram negative organism. Four blood culture specimens were sent and all grew Gram positive cocci in chain which were later identified by Vitek II machine using GP card and 16SrRNA as Granulicatella adiacens, a nutritionally-variant streptococci. However, antibiotic susceptibility testing (AST) in accordance with the Clinical and Laboratory Standard Institute guideline, M-45 document, failed due to the fastidious nature of the organism. Figure 1 shows positive satellitism test of the organism (enhanced growth toward the Staphylococcus aureus streaked).

The diagnosis was changed to IE secondary to Granulicatella adiacens with underlying chronic rheumatic heart disease. She was planned for continuation of intravenous ceftriaxone 2 grams daily for six weeks at the district hospital due to logistic problem with fortnightly appointment at multidisciplinary team clinic to repeat echocardiogram. After 17 days on intravenous ceftriaxone, repeat echocardiogram showed reduced size of vegetation at the mitral valve from 0.5 cm to 0.2 cm. The C-reactive protein showed reducing trend from 95 mg/L to undetectable level. Blood culture and sensitivity tests sent from district hospital were also negative after three weeks on ceftriaxone.

However, two weeks after she was discharged, she developed intermittent fever associated with difficulty in breathing on exertion. Blood culture and sensitivity was taken during multidisciplinary team clinic visit and it was positive for similar organism. A repeat echocardiogram showed an increment in the vegetation size to 0.4 cm. She was started back on intravenous ceftriaxone 2 grams daily and was then transferred back to the district hospital. She was planned for completion of intravenous ceftriaxone for six weeks with fortnightly review in multidisciplinary team clinic. She was planned for readmission at 34-36 weeks of pregnancy for delivery.

Unfortunately, on Day-22 of intravenous ceftriaxone, at 28 weeks of pregnancy, she developed sudden onset of epigastric pain radiated to her back. She was referred to cardiothoracic team for complicated infective endocarditis with distant embolization resulting in splenic infarct. The splenic infarct was treated conservatively. An expedited multidisciplinary discussion was conducted, to decide on next course of action, because patient was not responding to the treatment, and surgical intervention was indicated due to increased vegetation size to one centimeter. At that time, the estimated fetal weight was 1.2

![Image of positive satellitism test](image.png)

Fig. 1: Positive satellitism test evidenced by enhanced growth of *Granulicatella adiacens* along the *Staphylococcus aureus* streak.
kg. Emergency lower segment cesarean section and bilateral tubal ligation was performed. The baby was intubated and admitted in a neonatal intensive care unit. Four months after the emergency cesarean section, she then underwent mitral valve replacement with tricuspid annuloplasty under cardiothoracic team which was uneventful. She is currently on life-long warfarin therapy under medical and cardiothoracic team follow up.

3. DISCUSSION

In developing countries, rheumatic heart disease is still the most common predisposing cause of IE. Newly diagnosed IE during pregnancy is rare but maternal mortality rate has been reported to be as high as 10.5-11.5 % with fetal mortality of 14.3 %. If inadequately treated, the patients’ condition may deteriorate rapidly, and result in significant sequelae such as congestive heart failure, pulmonary edema, embolic events, abscess formation, or mycotic aneurysm. 

Granulicatella sp and Abiotrophia sp are the members of nutritionally-variants streptococci. Both colonize the normal flora of the human pharynx, urogenital and intestinal tracts. Granulicatella sp has been documented causing significant infections such as endocarditis, septicemia or bacteremia. Three species of Granulicatella have been described such as G. adiacens, G. elegans and G. balaenopterae.

It has been suggested that Granulicatella may be under-reported and diagnosed as ‘culture-negative’ endocarditis. IE cases caused by the Abiotrophia and Granulicatella genera represent around 1-3% of all IE. Endocarditis caused by G. adiacens is more common than that caused by Abiotrophia spp, with G. elegans being comparatively rare.

Granulicatella and Abiotrophia caused IE in a protracted course, which is associated with large vegetations (8mm-26mm in size), higher rates of complications and valve replacement (around 50%). Accurate and rapid identification of Granulicatella and Abiotrophia spp. have been difficult in clinical microbiology laboratories. Colonies are usually non-hemolytic or alpha-hemolytic, small, measuring 0.2 to 0.5 mm in diameter with varying microscopic appearance, either typical streptococcal isolate (single cells, in pairs or in short chains) or swollen pleomorphic forms. Both Granulicatella adiacens and Granulicatella elegans were previously identified as Gemella spp., and it has been reported that G. elegans was misidentified as Streptococcus acumininis, Gemella morbillorum, and Granulicatella adiacens.

To the best of our knowledge, this is the first case of Granulicatella adiacens IE that occurred in first trimester pregnancy being reported in the world.

G. adiacens IE have been reported approximately in 29 cases worldwide occurring in immunocompetent male, male with history of CRHD and non-pregnant lady. Previously reported infective endocarditis case that happened due to Abiotrophia defectiva (another type of NVS) was in third trimester of pregnancy that was associated with the presence of fixed braces. The most common valve involved in previous literatures were aortic valve (44%) followed by mitral valve (38%) like what happened in this patient and tricuspid valve (13%). Embolism occurred in 30% of the cases reported. Multidisciplinary team, consisting of a cardiologist, infectious disease physician, obstetrician, obstetric anesthetist and neonatologist, is essential in the management of IE in pregnancy from the onset of the diagnosis. Antibiotic recommendations for NVS include Penicillin G, ceftriaxone or vancomycin for six weeks, combined with an aminoglycoside for at least the first two weeks.

4. CONCLUSION

IE caused by G. adiacens during pregnancy is rare. Prompt diagnosis and proper management involving multidisciplinary team is crucial to minimize the embolic events, and to avoid serious sequelae to both the patient and fetus.

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6. Ethical approval

This work did not require ethical approval from our institution.

7. Conflict of interest

All authors have no conflict of interest to be declared.

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9. Authors contribution

ZNS: Concept and planning.

All authors took active part in the management of the patient as well as drafting and reviewing the manuscript.

SAH: Laboratory diagnosis and writing the microbiology section

10. Reference


