ISSN: 1607-8322, e-ISSN: 2220-5799 **Anaesthesia, Pain & Intensive Care**
Vol 27(6); December 2023 DOI: 10.35975/apic.v27i6.2359

CASE REPORT PERIOPERATIVE MEDICINE

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

Norjihan Abdul Hamid[1], V. Rubini Nair Muthi @ P.S Muthialu[2], Mohd Zulfakar Mazlan[3], Wan Yus Haniff Wan Isa[4], Alwi Muhd Besari@ Hashim[5], Ahmad Zuhdi Mamat[6], Erinna Mohamad Zon[7], Siti Asma' Hassan[8], Zeti Norfidiyati Salmuna[9*]

Author affiliations:

1. Norjihan Abdul Hamid, Department of Medical Microbiology and Parasitology, School of Medical Sciences, Universiti Sains Malaysia, Kelantan, Malaysia; E-mail: sh_jihan@hotmail.com
2. V. Rubini Nair Muthi @ P.S Muthialu, Department of Internal Medicine, School of Medical Sciences, Universiti Sains Malaysia, Kelantan, Malaysia; E-mail: vrubininair@gmail.com
3. Mohd Zulfakar Mazlan, Department of Anesthesiology and Intensive Care, School of Medical Sciences, Universiti Sains Malaysia, Kelantan, Malaysia; E-mail: zulfakar@usm.my; ORCID: {0000-0002-3452-1280}
4. Wan Yus Haniff Wan Isa, Department of Internal Medicine, School of Medical Sciences, Universiti Sains Malaysia, Kelantan, Malaysia; E-mail: wyhaniff@usm.my; ORCID: {0000-0001-9887-8441}
5. Alwi Muhd Besari@ Hashim, Department of Internal Medicine, School of Medical Sciences, Universiti Sains Malaysia, Kelantan, Malaysia; E-mail: dralwi@usm.my; ORCID: {0000-0002-1502-1897}
6. Ahmad Zuhdi Mamat, Department of Internal Medicine, School of Medical Sciences, Universiti Sains Malaysia, Kelantan, Malaysia; E-mail: zuhdikk@usm.my; ORCID: {0000-0003-4218-7873}
7. Erinna Mohamad Zon, Department of Obstetrics and Gynecology, Health Campus, School of Medical Sciences, Universiti Sains Malaysia, Kelantan, Malaysia; E-mail: erinna@usm.my; ORCID: {0000-0003-4240-6298}
8. Siti Asma' Hassan, Department of Medical Microbiology and Parasitology, School of Medical Sciences, Universiti Sains Malaysia, Kelantan, Malaysia; E-mail: sitiasmakb@usm.my; ORCID: {0000-0002-0660-3932}
9. Zeti Norfidiyati Salmuna, MBBS, M.Path (Medical Microbiology), Department of Medical Microbiology and Parasitology, Health Campus, USM, 16150, Kubang Kerian, Kelantan, Malaysia. Email: zetifidiyati@usm.my / norfidiyatiz@yahoo.com; ORCID: {0000-0002-5618-2603}

Correspondence: Zeti Norfidiyati Salmuna; E-mail: zetifidiyati@usm.my / norfidiyatiz@yahoo.com; Phone: +6012-9555249 / +609-7676286 (Ext:6252); Fax: +609-7676289.

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

Citation: Hamid NA, PS Muthialu VRNM, Mazlan MZ, Wan Isa WYH, Hashim AMB, Mamat AZ, Zon EM, Hassan SA, Salmuna ZN. *Granulicatella adiacens* infective endocarditis complicated with splenic infarct in pregnancy: A case report and literature review. Anaesth. pain intensive care 2023;27(6):786−789; **DOI:** 10.35975/apic.v27i6.2359

Received: November 15, 2023; **Reviewed:** November 16, 2023; **Accepted:** November 16, 2023

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).[1] 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

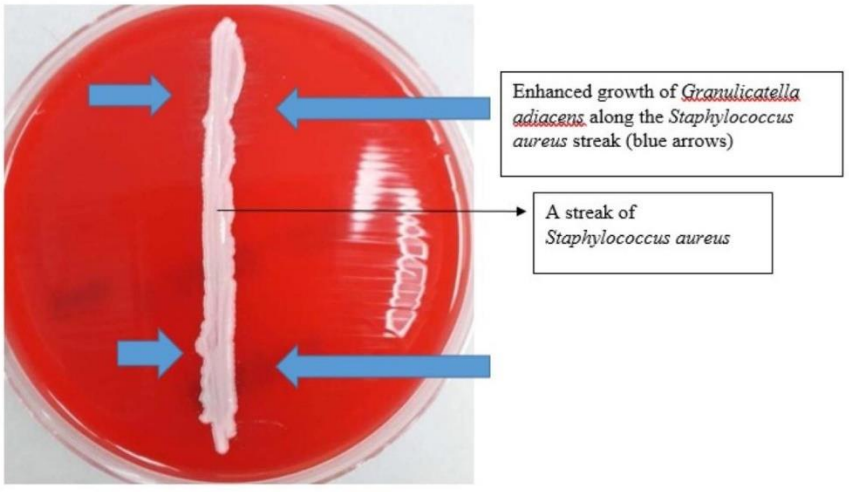

Fig. 1: Positive satellitism test evidenced by enhanced growth of *Granulicatella adiacens* along the *Staphylococcus aureus* streak.

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%.[2] 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.[3]

Granulicatella sp and *Abhiotrophia* 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.[4] Endocarditis caused by *G. adiacens* is more common than that caused by *Abiotrophia* spp, with *G. elegans* being comparatively rare.[5]

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%).[6] 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 acidominimus*, *Gemella morbillorum*, and *Granulicatella adiacens* [7]

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.[6,8,9] 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.[10] 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%).[6] Embolism occurred in 30% of the cases reported.[6]

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.[8]

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.

5. Funding

The authors received no specific grant from any funding agency.

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.

8. Acknowledgement

We express our gratitude to the Director, Hospital Universiti Sains Malaysia (USM), Kubang Kerian, Kelantan for granting the permission to the investigators to use patients' medical record; space and assets belong to the hospital as well as to the staffs of the hospital USM.

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

1. Tellez A, Llopis J, Falces C, Pericàs JM, Falces C, Almela M, et al. Epidemiology, Clinical Features, and Outcome of Infective Endocarditis due to Abiotrophia Species and Granulicatella

Species: Report of 76 Cases, 2000-2015. Clin Infect Dis 2018; 66: 104–111. [PubMed] DOI: 10.1093/cid/cix752

2. Kebed KY, Bishu K, Al Adham RI, Baddour LM, Connolly HM, Sohail MR, et al. Pregnancy and postpartum infective endocarditis: A systematic review. Mayo Clinic Proceedings 2014; 89: 1143–1152. [PubMed] DOI: 10.1016/j.mayocp.2014.04.024
3. Giulieri S, Meuli RA, Cavassini M. Complications of infective endocarditis. In: Infections of the Central Nervous System: Fourth Edition. Wolters Kluwer Health Adis (ESP). Epub ahead of print 21 April 2014. DOI: 10.2174/1871529x10909040240.
4. Murdoch DR, Corey RG, Hoen B, Miró JM, Fowler VG Jr, Bayer AS, et al. Clinical presentation, etiology, and outcome of infective endocarditis in the 21st century. The international collaboration on Endocarditis-prospective cohort study. Arch Intern Med 2009; 169: 463–473. [PubMed] PMCID: PMC3625651 DOI: 10.1001/archinternmed.2008.603
5. Cristensen JJ, Facklam RR. Granulicatella and Abiotrophia species from human clinical specimens. J Clin Microbiol 2001; 39: 3520–3523. [PubMed] MCID: PMC88382 DOI: 10.1128/JCM.39.10.3520-3523.2001
6. Adam EL, Siciliano RF, Gualandro DM, Calderaro D, Issa VS, Rossi F, et al. Case series of infective endocarditis caused by Granulicatella species. Int J Infect Dis 2015; 31: 56–58. [PubMed] DOI: 10.1016/j.ijid.2014.10.023
7. Abdul-Redha RJ, Prag J, Sonksen UW, Kemp M, Andresen K, Christensen JJ. . Granulicatella elegans bacteraemia in patients with abdominal infections. Scand J Infect Dis 2007; 39: 830–833. [PubMed] DOI: 10.1080/00365540701299624
8. Culleton S. Just Another Stroke? A case of infective endocarditis causing an embolic stroke and splenic aneurysms. J Belg Soc Radiol. 2016 Jan 28;100(1):1. DOI: 10.5334/jbr-btr.957. [PubMed] PMCID: PMC5854447 DOI: 10.5334/jbr-btr.957
9. Shailaja TS, Sathiavathy KA, Unni G. Infective endocarditis caused by Granulicatella adiacens. Indian Heart J 2013; 65: 447–449. [PubMed] MCID: PMC3861137 DOI: 10.1016/j.ihj.2013.06.014
10. Birlutiu V, Birlutiu RM. Endocarditis due to Abiotrophia defectiva, a biofilm-related infection associated with the presence of fixed braces: A case report. Medicine (Baltimore). 2017 Nov;96(46):e8756. . [PubMed] PMCID: PMC5704873 DOI: 10.1097/MD.0000000000008756

