

## A Case of Gonococcal Endocarditis in the 21<sup>st</sup> Century

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### Abstract

In the antibiotic era, gonococcal endocarditis is extremely rare with only a handful of cases reported in the literature. This case report describes a case of aortic valve endocarditis due to *Neisseria gonorrhoeae* in a somewhat unexpected patient, illustrating the importance of considering this pathogen in all sexually active patients who present febrile with a new murmur.

### Case Report

A 41 year old female mental health nurse presented with a seven-day history of dry cough. This was associated with fevers, rigors and nocturnal sweats on a background of lethargy, myalgias and low grade fevers in the preceding three weeks. She had been seen by her general practitioner 10 days prior and started on a course of amoxicillin for a presumed chest infection. On arrival to the emergency department, she was febrile. However, the remainder of her physical examination was reported as normal. An infectious focus was not identified (clear chest x-ray and urinalysis) and a presumptive diagnosis of an undifferentiated viral illness was made. Blood cultures and viral serology for respiratory pathogens, cytomegalovirus, and Epstein Barr virus were sent and she was discharged to her general practitioner for further review.

The following day, the woman represented following a 15-minute episode of central chest pain occurring at rest associated with mild dyspnoea. There was no radiation and the pain was neither pleuritic nor positional. Serial electrocardiograms were normal and initial troponin negative. The patient was febrile (T=37.9°C) and tachycardic (HR 106) with mild hypertension (BP 150/80). Cardiovascular examination revealed a grade 3/6 diastolic murmur heard maximally over the left sternal edge. A number of splinter haemorrhages were noted however, there were no other peripheral stigmata of infective endocarditis. There were no signs of congestive heart failure. Abdominal examination was significant for a mildly tender liver edge. The remaining examination was unremarkable.

Further history revealed she had migrated from the Philippines more than 20 years ago. She was married with two young children and working as a mental health care nurse. There was no significant past medical problems. She was a non-smoker and non-drinker, and denied any history of recreational intravenous drug use, tattoos or body piercings. To her knowledge, she had not had rheumatic heart disease or a documented heart murmur. She had visited the Philippines during the Christmas holidays, but had no contact with livestock or recent dental procedures. Of note her husband had recently been diagnosed and treated for gonococcal urethritis a month prior with ciprofloxacin. She denied any symptoms of urethritis, rash or arthralgia, had had a negative urine test for gonorrhoea, and also received ciprofloxacin prophylaxis at that time.

Two further sets of blood cultures were sent and the woman was referred for an urgent transthoracic echocardiogram that confirmed findings consistent with an aortic valvular vegetation with moderate aortic regurgitation.

Empirical treatment for infective endocarditis was instituted with the addition of ceftriaxone to cover gonococcal infection in lieu of her

recent exposure. On advice by the infectious diseases team, a regimen of flucoxacin 2 g QID and ceftriaxone 2 g daily as well as a stat dose of azithromycin 1 g IV to cover possible concurrent chlamydial infection was commenced. Two days later, two aerobic blood cultures came back positive for *Neisseria gonorrhoeae*. Therapy was rationalised to 2g intravenous ceftriaxone daily.

An excellent clinical response was observed to intravenous therapy with rapid cessation of fever and night sweats as well as normalisation of inflammatory markers. She was discharged to a home antibiotic regimen after a week of inpatient therapy (Table 1).

Fortunately screening for other sexually transmitted diseases including Hep B, C, HIV, HTLV-1, syphilis and chlamydia were all negative. She received a total of 18 days of intravenous therapy. Her husband has also been retreated with ceftriaxone and follow-up serological testing has been arranged. The patient was re-admitted to hospital within 2 weeks of discharge with symptoms of heart failure. Repeat echocardiogram confirmed severe aortic incompetence and she subsequently underwent a mechanical aortic valve replacement.

### Discussion

This case report of aortic valve gonococcal endocarditis in a married middle aged female nurse represents a rare complication of a common disease in a patient who does not fit the usual demographic. In the pre-antibiotic era, *Neisseria gonorrhoeae* endocarditis was common, accounting for 11 to 20% [1] of cases of bacterial endocarditis. However in the current antibiotic era, gonorrhoeal endocarditis is rare despite the rising incidence of gonorrhoea urethritis and cervicitis. In fact, in the antibiotic era, the largest case series to date is 5 patients acquired over an 8 year time period [2]. Disseminated gonococcal infection is reported to occur in 1-3% of gonococcal infections and gonococcal endocarditis is a complication in only 1-2% of patient with disseminated gonococcal infection [3].

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Gonococcal endocarditis typically occurs in younger males between the ages of 15 and 35 [3]. Whilst the majority of cases occur in immunocompetent individuals [1-3] there appears to be an increased susceptibility to gonococcal endocarditis in patients with terminal complement deficiencies [4]. Most case reports have described endocarditis on native valves, however a few cases of prosthetic valve infection have been reported. A number of case reports have described gonococcal endocarditis affecting pregnant women and one following a threatened abortion [5]. The most commonly involved valve is the aortic valve [1,2,6] followed by the mitral valve however predilection for right sided heart valves has been described, predominantly in the pre-antibiotic era (Table 2).

Most cases present with a non-specific febrile illness. Two in three cases fail to exhibit genitourinary symptoms or the classic triad of disseminated gonococcal infection: rash, tenosynovitis and arthritis [1,2]. The average period from symptom onset to diagnosis is approximately 45 days [3]. Fulminant presentations with heart failure secondary to torrential regurgitation [6] or embolic phenomena have been documented as has deterioration despite appropriate antibiotic therapy [3].

One should always consider gonococcal endocarditis in the patient at high risk of having acquired a sexually transmitted infection who presents with a new or changing murmur. It is interesting to note that

Penicillin Minimum Inhibitory Concentration	4.0 mg/L – Resistant
Ciprofloxacin Minimum Inhibitory Concentration	6.0 mg/L – Resistant
Ceftriaxone Minimum Inhibitory Concentration	0.006 mg/L Susceptible

Table 1: Sensitivities.

Test	22/4/08	23/4/08	11/5/08
Full Blood Picture			
Haemoglobin[115-160 g/L]	108 L	99L	98L
Mean Cell Volume[80-100]	88	87	87
White Cell Count[4.00-11.00 x 10 <sup>9</sup> /L]	13.40 H	14.90H	8.00
Neutrophils[2.00-7.50 x 10 <sup>9</sup> /L]	11.11 H	12.28H	4.96
Lymphocytes[1.20-4.00 x 10 <sup>9</sup> /L]	1.72	1.56	2.48
Platelets[150-400 x 10 <sup>9</sup> /L]	415 H	387	338
Liver Function Tests			
Protein[60-80g/L]	87 H	80	85H
Albumin[35-50g/L]	39	35	41
Globulins[23-35 g/L]	48 H	45H	44H
Bilirubin[<20 umol/L]	8	7	3
ALT[<35 U/L]	73 H	67	41H
ALP[35-135 U/L]	141 H	143H	85
GGT[<40U/L]	230 H	230H	68H
Urea and Electrolytes			
Sodium[134-146 mmol/L]	136	146	139
Potassium[3.4-5.0 mmol/L]	3.9	3.8	4.1
Bicarbonate[22-32 mmol/L]	27	25	27
Urea[3.0-8.0 mmol/L]	3.1	3.7	3.7
Creatinine[45-90 umol/L]	56	57	59
eGFR[ > 60 ml/min/1.73 m <sup>2</sup> ]	> 60	>60	>60
C-reactive protein[<5 mg/L]		250H	19
Erythrocyte sedimentation Rate[1-20 mm/hr]		108H	

Table 2: Biochemistry and Haematology results on presentation and discharge.

in the case described the blood cultures taken on the initial day of presentation were not positive. *Neisseria gonorrhoeae* is a fastidious organism and blood cultures may not become positive for up to a week. Supportive findings would include a positive Polymerase Chain Reaction (PCR) for *Neisseria gonorrhoeae* on a first pass urine sample.

Gonococcal endocarditis is a serious infection. Up to 50% of cases require valve surgery usually as a result of valvular incompetence and progressive congestive cardiac failure [6]. Mortality still remains high at 19% [3,6] despite effective antibiotic therapy. For this reason, some bodies have suggested routine transoesophageal echocardiography for all patients with suspected gonococcal endocarditis to improve sensitivity of diagnosis and to screen for complications such as abscess formation [6]. In the case described above, the diagnosis was clear based on transthoracic images. Transoesophageal echo was reserved in case the patient failed to respond to therapy.

Penicillin resistant strains of gonorrhoea causing infective endocarditis have been described infrequently in the literature [7]. Due to the high incidence of penicillin- resistant gonococcal infection in Australia, and the rising incidence of ciprofloxacin resistance, the current recommendation is a third generation cephalosporin. Minimum duration of therapy is two weeks [7]. As with all Sexually Transmitted Infections (STI), screening for other STI's including HIV, hepatitis, syphilis, chlamydia are strongly recommended.

## Conclusion

Gonococcal endocarditis is a rare but serious condition which should be considered in all patients at risk of having acquired a sexually transmitted infection who present febrile with a new murmur. Due to the high prevalence of penicillin resistant gonococcal strains in Australia, empiric therapy with a third generation cephalosporin should be considered in the high-risk patient. Close monitoring for complications, such as abscess formation, progressive valvular incompetence and heart failure, are essential given the high proportion of cases that require surgical intervention.

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