CASE REPORT

Pathogenic *Sarcina* in urineKarthik Bommannan,¹ Balan Louis Gaspar,² Man Updesh Singh Sachdeva¹

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SUMMARY

Sarcina is a Gram-positive anaerobic coccus that has been consistently reported in the upper gastrointestinal tract biopsies of patients with evidence of gastric stasis. The pathogenic role of *Sarcina* in humans is not entirely known. We describe an infant who was surgically treated for posterior urethral valve and the urine showed pathogenic *Sarcina*.

BACKGROUND

Sarcina is a Gram-positive anaerobic coccus that is well known for its association with lethal 'abomasal bloat' in the livestock. In recent years, *Sarcina* has been consistently reported in the upper gastrointestinal tract (UGIT) biopsies of patients with evidence of gastric stasis.¹ The pathogenic role of *Sarcina* in human beings is not clear. Other than the gastrointestinal tract, a *Sarcina* has been documented in a case of lung infarction.² We describe an infant who was surgically treated for posterior urethral valve with bilateral grade V vesicoureteric reflux and the urine showed pathogenic *Sarcina*.

CASE PRESENTATION

A male infant aged 10 months with posterior urethral valve and bilateral grade V vesicoureteric reflux underwent transurethral fulguration. The

postoperative period was uneventful. After 5 months, he developed stricture of the membranous urethra and was treated by urethral dilation. The routine urine specimen was turbid. Subsequently, under aseptic precautions, a suprapubic aspiration of urine sample was collected. Wet-mount preparation of the suprapubic urine sample showed plenty of pus cells. In addition, organisms with morphology consistent with that of *Sarcina* were seen (figure 1A). May-Grünwald Giemsa staining was performed on the air-dried urine smears (figure 1B, C). The smears revealed tetrad and octet arrangement of Gram-positive cocci characteristic of *Sarcina* (figure 1D). A few were also seen within the cytoplasm of the phagocytes. However, the urine cultures were sterile.

TREATMENT

The child received a combination of ciprofloxacin and metronidazole for 2 weeks and the repeat urine samples were negative for *Sarcina*.

OUTCOME AND FOLLOW-UP

Since the facilities for sequencing of *Sarcina* genome were not available in our centre, the urine samples were not further subjected to molecular genetic studies for confirmation.

Figure 1 *Sarcina* in urine. (A) Unstained wet-mount urine preparation showing plenty of *Sarcina*; (B) air-dried urine smears stained with May-Grünwald Giemsa showing clusters of *Sarcina*. (C) Black arrow shows phagocytosed *Sarcina*; (D) Gram-positive *Sarcina* (red arrows).

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DISCUSSION

Sarcina was first documented in 1842 by Goodsir.³ It is a Gram-positive, spore forming, obligate anaerobic coccus belonging to the *Clostridiaceae* family.⁴ The organism's peculiar arrangement in tetrads and octets is readily identified by light microscopy.⁵ There has been an exponential rise in the number of publications documenting *Sarcina* in the UGIT of human beings.¹ Although *Sarcina* has a well-established role in the aetiopathogenesis of 'abomasal bloat' (a lethal disease of the livestock), its role as a human pathogen is not clear.⁶ Recent literature suggests that *Sarcina* does have a pathogenic role in human beings.^{7–10} Apart from UGIT, *Sarcina* has been identified in pulmonary gangrene and peripheral blood, but these patients also had comorbidities causing GI dysfunction.^{2 11} It is hypothesised that gastric stasis is a harbinger of *Sarcinosis*.¹ Hence, the detection of *Sarcina* in gastric biopsies is a surrogate marker of stasis. *Sarcina* is a part of normal cutaneous and colonic microbiota.¹² In the index case, there were no signs of fistulous communications between the urinary, gastrointestinal or cutaneous tracts. Moreover, demonstration of *Sarcina* in the suprapubic urine sample with aseptic precautions literally rules out contamination. This is corroborated by the presence of phagocytosed *Sarcina* which is a strong indicator of host response to the

pathogen. The prompt response to antibiotic treatment in turn supports the pathogenic role of *Sarcina* in the index case. Getting a sterile urine culture is not uncommon because *Sarcina* is a fastidious organism and requires special techniques for isolation.¹³

Contributors KB, BLG and MUSS contributed equally in reporting and writing the paper.

Competing interests None declared.

Patient consent Obtained.

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Learning points

- The existing literature has focused *Sarcina* as an organism restricted to the gastrointestinal tract (GIT). Our report suggests that *Sarcina* is not restricted to the GIT alone.
- In the index case, posterior urethral valve and surgical interventions would have resulted in urine stasis with subsequent *Sarcinosis*. This phenomenon is similar to the gastric stasis hypothesis.
- Our case adds new insights into the existing knowledge with regard to the aetiopathogenic role of *Sarcina* and emphasises the fact that the infection is potentially treatable with appropriate antibiotics.

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