CLINICAL AND MICROBIOLOGICAL CHARACTERISTICS OF PYOGENIC SPONDYLODISCITIS: A RETROSPECTIVE STUDY

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Introduction

- Pyogenic spondylodiscitis (PS) is a severe bacterial infection involving the intervertebral disc space and adjacent vertebral bodies.
- Global incidence has risen by over 100% in recent decades due to aging populations and increased immunosuppression.
- Diagnosis is challenging as symptoms often mimic common back pain, leading to diagnostic delays.
- Microbiological profiles vary significantly by geographic region; local data is essential for effective empirical antibiotic therapy.

Study Objectives

- To analyze the clinical and microbiological characteristics of confirmed PS cases at a tertiary hospital in Kathmandu, Nepal.
- To define the local pathogen distribution and correlate findings with patient outcomes.
- To provide evidence-based insights for optimizing empirical antibiotic protocols in the Nepalese context.

Materials and Methods

Category	Details
Study Design	Retrospective Medical Record Review
Duration	January 2017 to December 2024
Inclusion Criteria	Clinical/Radiological diagnosis with positive culture(spinal pus or tissue)
Sample Size	n= 19 patients
statistical Analysis	SPSS statistics v27.0; Fisher's Exact Test($p<0.05$)

Results – Demographics & Clinical Presentation

- Age: Mean 58.8 ± 15.4 years (range: 28–86).
- Gender: 78.9% Male (n = 15).
- Symptom Duration: Mean 32.4 ± 29.5 days prior to diagnosis.
- Neurological Deficit: 36.8% (n = 7) presented with weakness or paraplegia.
- Comorbidities: Diabetes Mellitus was the most common (26.3%, n = 5)

Results – Anatomical Location & Labs

Characteristics	Findings(n=19)
Lumbar/Dorso-lumbar	63.2% (n = 12)
Thoracic	31.6% (n = 6)
Cervical	5.3% (n = 1)
Mean CRP	148.6 ± 50.3 mg/L
Mean ESR	68.7 ± 11.2 mm/h

Results – Microbiological Profile

- Staphylococcus aureus: 47.4% (n = 9) – Most common single pathogen.
- Escherichia coli: 31.6% (n = 6).
- Endemic Pathogens: 10.5% (n = 2) isolated Salmonella typhi and Brucella melitensis.
- Mixed Gram-Negative Bacilli (GNB): 10.5% (n = 2).
- Total GNB Prevalence: 52.6% (n = 10).
- Resistance: 0% rate of MRSA or ESBL resistance observed.

Management and Outcomes

- Surgical Intervention: 52.6% (n = 10) required decompression, instrumentation, or debridement.
- Conservative Management: 47.4% (n = 9) treated with ≥6 weeks of targeted antibiotics.
- Surgery & Deficits: 71.4% of patients with neurological deficits (5/7) required surgery.
- Clinical Success Rate: 94.7% overall success (resolution of pain and normalization of inflammatory markers).

Discussion

- High GNB Rate: Collective Gram-negative prevalence (52.6%) is significantly higher than in many Western cohorts (< 15%), likely linked to local intra-abdominal or urinary sources.

- Advanced Presentation: Neurological deficit rate (36.8%) exceeds the 10-20% global benchmark, indicating diagnostic delays or late referrals.

- Regional Pathogens: The presence of S. typhi and Brucella highlights the need for endemic-specific diagnostic workups.

Conclusion

- Aggressive, pathogen-specific management yields excellent clinical success (94.7%).
- The high prevalence of Gram-negative organisms mandates that local empirical antibiotic protocols in Nepal ensure adequate coverage for GNB.
- Early tissue-based diagnosis remains the gold standard for guiding effective therapy.

Key References

- Gouliouris T, et al. Pyogenic Spondylodiscitis: A review of the literature. J Bone Joint Surg Am. 2021;103(17):1604-1614.
- Grammatico L, Varennes B. Pyogenic Spondylodiscitis: A review of current management. Orthop Traumatol Surg Res. 2017;103(6):859-886.
- Dhital KR, et al. Profile of Pyogenic Spondylodiscitis in a Tertiary Care Hospital of Nepal. J Nepal Med Assoc. 2022;60(250):504-508.