

# Retrospective Review of Microbiological profile in Post Surgical Spine Infections and Assess the Appropriateness of Current Pre-Op Antibiotic Prophylaxis Policy

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## Background:

- ❖ SSI(Surgical Site Infection) is a devastating complication of spine surgery that results in significant morbidity as it requires prolonged antibiotic courses and multiple surgical debridements.
- ❖ It also increases the economic burden on the health care system and reduces the value of care. In order to develop effective strategies to prevent SSIs, understanding the impact of microbiological profiles on the appropriateness of the current pre-op antibiotic prophylaxis is essential. We sought to do this as outlined below.

## Methods:

- ❖ All SSIs cases reported by the hospital infection control surveillance program based on CDC/NHSN Surveillance definitions between January 2017 and July 2019 were retrospectively reviewed for Microbiological data and surgical characteristics using electronic medical record.
- ❖ Based on the microbiological profile and hospital antibiogram, appropriateness of current pre-op antibiotic policy was assessed.

## Results:

- ❖ Between January 2017 and July 2019, 3561 spine surgeries were performed, 51 cases of SSI were reported, and 50 patients have microbiological data available.

Post surgical spine infection	Total N=50
Monomicrobial	38
Polymicrobial	10
No growth	2

Table 1: Characteristics of the cultures

Gram-Positive Organisms	No. of Positive Cultures	Gram-Negative Organisms	No. of Positive Cultures
<i>Staphylococcus aureus</i>	19 (38%)	<i>Escherichia coli</i>	6(12%)
MRSA	10	<i>Klebsiella pneumoniae</i>	5
MSSA	9	<i>Klebsiella oxytoca</i>	1
<i>Staphylococcus epidermidis</i>	5(10%)	<i>Enterobacter cloacae</i>	4
MRSE	4	<i>Pseudomonas aeruginosa</i>	4
MSSE	1	<i>Proteus mirabilis</i>	1
<i>Staphylococcus lugdunensis</i>	1	<i>Serratia marcescens</i>	2
<i>Streptococcus pyogenes</i>	1	<i>Citrobacter freundii</i>	1
<i>Streptococcus agalactiae</i>	1		
<i>Enterococcus faecalis</i>	1		
<i>Cutibacterium acnes</i>	2		
<i>Peptostreptococcus</i>	1		
<i>Finegoldia magna</i>	1		
<i>Corynebacterium striatum</i>	2		

Table: 2 Microorganisms isolated from 50 patients with post-surgical spine infections

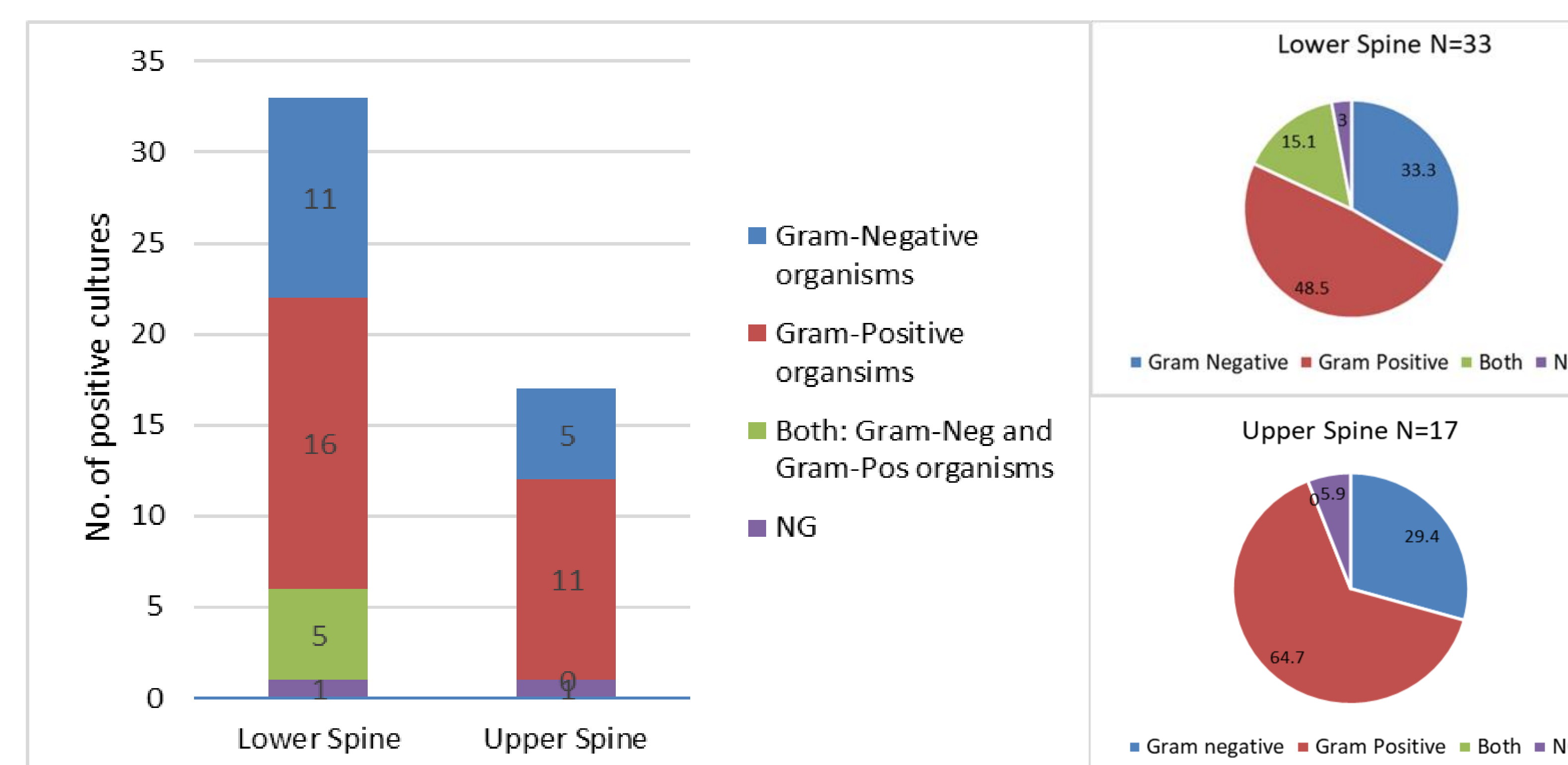


Figure 1: Proportional distribution of Micro-organisms between lower and upper spine ( No. of positive cultures on left side and percentage on right side )

## Results continued

- ❖ There was no statistical difference for the distribution of gram-negative organisms in upper spine (17) and lower spine (33) surgeries (29.4% vs 48.4%, p value = 0.24).
- ❖ However total gram-negative organisms accounted for 42% cases and lower spine surgical procedures were more likely to be associated with mixed infections including both gram negative and gram-positive organisms (15.1% vs 0%).
- ❖ Cefazolin-resistant gram-negative organisms accounted for 22% of all gram-negative infections.

## Conclusion:

- ❖ Although gram-positive organism predominated, there was a substantial portion of gram-negative organisms in post-surgical spine infections. Cefazolin would cover only half of the gram-negative organisms identified based on our antibiogram susceptibility pattern.
- ❖ Our current pre-op antibiotic policy recommends cefazolin plus or minus vancomycin (If MRSA screen positive) and clindamycin plus vancomycin in patients with severe penicillin allergy.
- ❖ Based on these finding we propose the addition of an agent with enhanced gram-negative coverage based on our institutional antibiogram as part of the peri-operative prophylactic regimen for (lower) spine surgeries.

## References:

- ❖ Abdul-Jabbar A, Berven SH, Hu SS, et al. Surgical Site Infections in Spine Surgery. *Spine*. 2013;38(22):E1425–E1431. doi:10.1097/BRS.0b013e3182a42a68.
- ❖ Bratzler DW, Dellinger EP, Olsen KM, et al. Clinical practice guidelines for antimicrobial prophylaxis in surgery. *American journal of health-system pharmacy*. 2013;70:195-283.