“Microbiological Diversity and Antimicrobial Resistance of Deep Neck Abscesses in Adult Patients at a Tertiary Hospital in Mexico”

Macias Arauza JM; Ortiz Hernández EG; Jimenez Padilla AL; González Prados A
Antiguo Hospital Civil de Guadalajara Fray Antonio Alcalde
Institution: Hospital Civil de Guadalajara "Fray Antonio Alcalde" / Universidad de Guadalajara, Mexico

Background

Deep neck infections (DNIs) are severe, life-threatening conditions involving the fascial spaces of the neck. While upper aerodigestive tract infections predominate in pediatric cases, odontogenic infections are the primary etiology in adults. Rising antibiotic resistance and shifting local microbiological profiles challenge the effectiveness of traditional empirical antibiotic regimens (e.g., Ampicillin/Sulbactam, Clindamycin, Penicillin). Local epidemiological mapping is critical to optimize empirical therapy and improve patient outcomes.

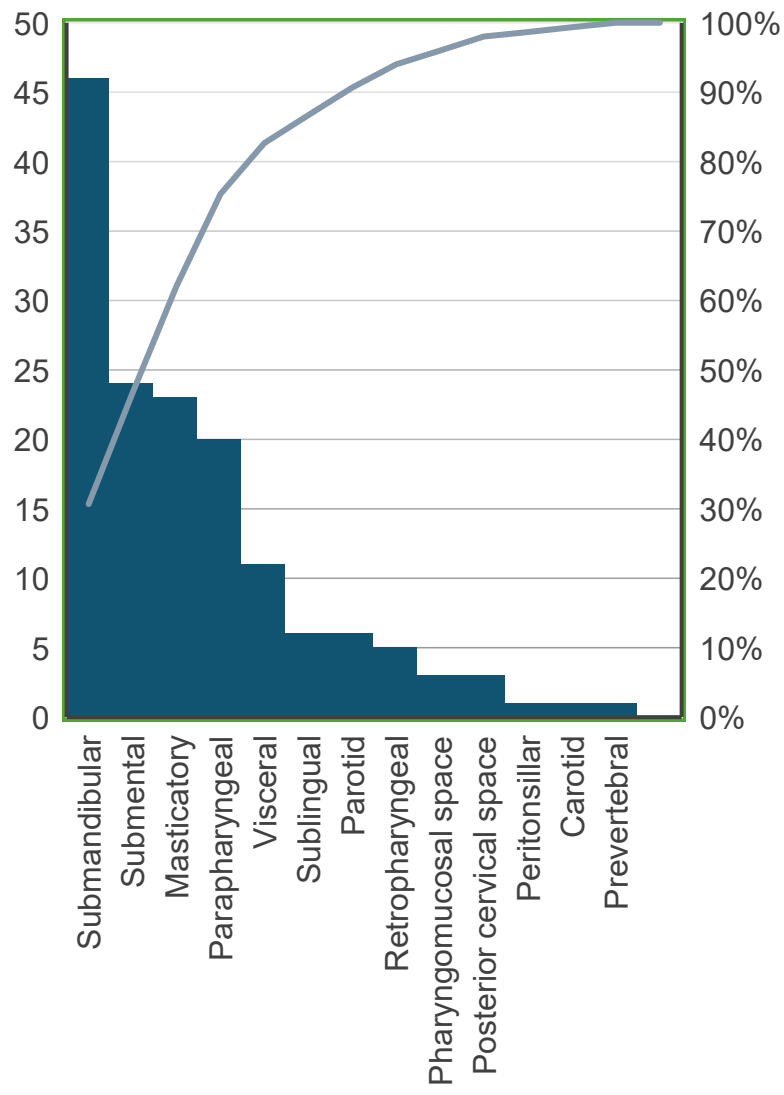
Objetive

To analyze the microbiological diversity, resistance patterns, and clinical-epidemiological characteristics of deep neck abscesses in adult patients treated at the Hospital Civil de Guadalajara "Fray Antonio Alcalde."

Methods

Study Design: Cross-sectional, ambispective descriptive study ($n = 60$ adult patients; 11 excluded for non-standardized sample handling).
Inclusion Criteria: Patients aged ≥ 16 years with a clinical and radiological diagnosis of deep neck abscess who underwent surgical drainage.
Procedures: Standardized intraoperative pus collection via sterile aspiration and immediate inoculation into aerobic/anaerobic blood culture bottles and sterile syringes for Gram stain, culture, and antimicrobial susceptibility testing.
Data Collected: Age, sex, socioeconomic status, comorbidities, prior antibiotic use, affected neck spaces, clinical signs, isolated pathogens, and antibiotic resistance profiles.

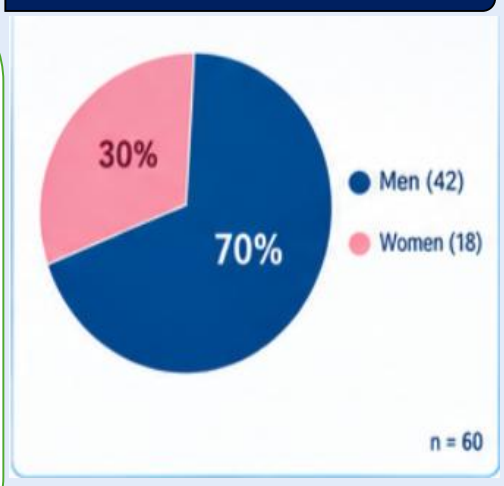
Affected Deep necks spaces



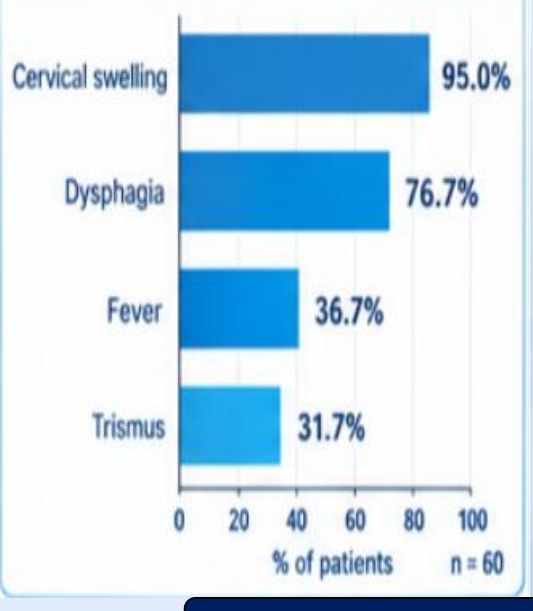
Key Findings

- ✓ Wide microbiological diversity, predominant from the aerodigestive tract.
- ✓ Odontogenyc origin was the main etilogy.
- ✓ S. Anginosus, S. Epidermidis and S. Hemolythicus were the most frecuenly isolated microrganisms.
- ✓ Antimicrobial resistance was mainly to clindamicin, penicilin and ampicilin.

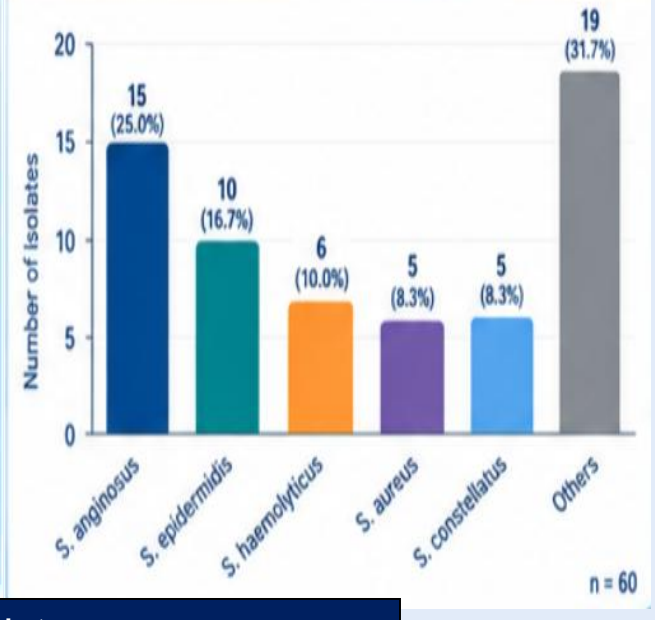
Distribution by sex



Main sings and symptoms



Main microrganism isolated



Antimicrobial Resistance

Antibiotic	S. anginosus (n=15)	S. epidermidis (n=10)	S. haemolyticus (n=6)	S. aureus (n=5)	S. constellatus (n=5)
Clindamycin	73%	60%	67%	40%	40%
Penicillin	67%	50%	83%	60%	20%
Ampicillin	60%	50%	67%	40%	20%
Erythromycin	53%	40%	50%	20%	20%
Cefoxitin	20%	30%	50%	20%	0%
Vancomycin	0%	0%	0%	0%	0%
Ciprofloxacin	13%	20%	17%	20%	0%
Tetracycline	7%	10%	17%	0%	0%
Cotrimoxazole	0%	10%	0%	0%	0%
Gentamicin	7%	10%	17%	0%	0%

Lower resistance
Higher resistance
n = 33 antibiograms

Conclusions

- **Etiology & Population:** Deep neck infections in this setting predominantly affect low-income adult males, with **odontogenic sources** and **Type 2 Diabetes Mellitus** as major contributing factors.
- **Microbiology:** *Streptococcus anginosus* and coagulase-negative *Staphylococci* (*S. epidermidis*, *S. haemolyticus*) are the principal pathogens isolated.
- **High Resistance to Standard Empiric Therapy:** Alarmingly high rates of resistance were observed against **Clindamycin, Penicillin, and Ampicillin**, which are routinely recommended in classic guidelines as first-line empiric treatments.
- **Surgical Value:** Despite high antibiotic resistance, prompt surgical drainage combined with standardized microbial sampling yields high cure rates (88.3%) and reduces culture-negativity.
- **Clinical Implication:** Local susceptibility data highlight the need to re-evaluate regional empirical antibiotic protocols toward broader-spectrum coverage (e.g., Piperacillin/Tazobactam or 3rd-generation Cephalosporins + Metronidazole) while awaiting culture results.

Key words

Deep neck abscess, empiric therapy, microbiology, odontogenyc infections antimicrobiological resistance,

Results

Comorbidities: 62% DM2
Odontogenic origin 68.3%
Pharyngeal origin: 20%
Leukocytosis: 91.6%

HOSPITAL CIVIL DE GUADALAJARA