



DIABETES AND PLEUROPULMONARY INFECTIONS: UNRAVELLING THE MICROBIOLOGICAL & RADIOLOGICAL SPECTRUM

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KEYWORDS :

INTRODUCTION

- Tuberculosis (TB) is a contagious disease caused by *Mycobacterium tuberculosis*, spread through respiratory droplets from people with active infection.
- It commonly affects the lungs (pulmonary TB) but can also involve other organs like the brain, abdomen, bones and kidneys (extrapulmonary TB).
- If not properly treated, TB can be fatal, causing around 3 million deaths annually.
- Pulmonary TB is the most common form, marked by damage to lung tissue and the formation of nodules.

Aims & Objectives

- To analyse microbiological & radiological parameters of pleuro pulmonary infections among diabetic patients.

METHODOLOGY

Source of Data:

- All patients aged above 18 years of age diagnosed with DM and having features of pleuro pulmonary infections admitted to the department of Respiratory Medicine, Kanachur Hospital & Research Centre, Deralakatte, Mangalore.
- Study design : Prospective study, Cross sectional, hospital based study

Assessment:

- The study was conducted over 20 months, from May 2023 to December 2024, after receiving approval from the Institutional Ethical Committee.
- It included patients with diabetes mellitus, either previously diagnosed or newly detected during their hospital stay, who showed signs of pleuro pulmonary infection-such as fever, pleuritic chest pain and cough—along with supporting radiological findings.
- A detailed history and physical examination were done for all patients. Informed consent was obtained.
- Necessary investigations were carried out, and samples were collected for analysis.

Sample Size Calculation

- $N = Z^2 pq / d^2$
- $Z^2 = 1.96$ for 95% confidence interval
- $P = 48\%$ (prevalence of pleuro pulmonary infections among diabetic patients)
- $Q = 1 - p$
- $D = \text{margin of error} = 10\%$
- Therefore, the required sample size calculated for the study was 95.

Inclusion Criteria:

- Known diabetes mellitus patients who were recently

diagnosed with DM in an admission

- Characteristics of pleuro-pulmonary infections with imaging evidence

Exclusion Criteria:

- Individuals of age <18 years,
- Secondary cases for hyperglycemia (like drug-induced, pathology, other endocrine disorders),
- Other associated immunodeficiency states such as retroviral disease, renal/hepatic failure, patients on immunosuppressive drugs,
- DM with endobronchial mass lesion causing obstructive pneumonia/lung abscess
- Transudative pleural effusion

Incidence in Diabetes Patients: In the present study, 94.74% had T2DM and 5.26% had T1DM.

TYPE OF DIABETES	Frequency	%
II	90	94.74%
I	5	5.26%
Total	95	100%
Invalid	0	0%
Total	95	100%

Radiological Pattern :

RADIOLOGICAL PATTERN	Frequency	%
EMPYEMA	43	45.26%
CONSOLIDATION	28	29.47%
BRONCHIECTASIS	24	25.26%
Total	95	100%

Microbiological Pattern:

- When we assessed the acid-fast bacilli by ZN staining, 54.74% had no AFB positivity. Amongst those that had sputum AFB positivity, 18.95% had 3+, 15.79% had 1+ and 10.53% had 2+.

SPUTUM AFB	Frequency	%
NEG	52	54.74%
3 POS	18	18.95%
1 POS	15	15.79%
2 POS	10	10.53%
Total	95	100%

Bacterial Pattern:

- Associated bacterial culture in sputum was analysed and we observed that most common organism isolated was Klebsiella in 41.05%, Proteus in 16.84% and remaining organisms being 8.42% respectively

BACTERIAL CULTURE	Frequency	%
KLEBSIELLA	39	41.05%
PROTEUS	16	16.84%
ACINETOBACTER	8	8.42%
MIXED	8	8.42%
PSEUDOMONAS	8	8.42%
STREPTOCOCCUS	8	8.42%
STERILE	8	8.42%
Total	95	100%

CONCLUSION**Radiological Diagnosis**

- The most common diagnosis noted was Empyema in 45.26%, consolidation in 29.47% and bronchiectasis in 25.26%.

Sputum Positivity, Organism In Isolate

- When we assessed AFB by ZN staining, 54.74% had no discernable AFB positivity, which is slightly higher than half the population. Amongst those that had sputum AFB positivity, 18.95% had 3+, 15.79% had 1+ and 10.53% had 2+.

Other Bacteria:

- Associated bacterial culture in the sputum was analysed, and we observed that the most common organism isolated was Klebsiella, followed by Proteus and remaining organisms respectively.
- Diabetic patients typically experienced severe lung infections and unfavourable prognoses, as indicated by elevated mean PORT risk scores. They exhibited bilateral lesions with multi lobe or lower lobe involvement more frequently, as evidenced by radiography, compared to nondiabetic patients.

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