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Pulmonary Medicine

COMPARISON OF INDUCED SPUTUM AND BAL CBNAAT IN DIAGNOSING SPUTUM CBNAAT NEGATIVE PULMONARY TUBERCULOSIS IN GOVERNMENT GENERAL HOSPITAL, KAKINADA

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ABSTRACT **Introduction:** Tuberculosis is a global health burden. SputumCbnaat remains as an important tool of diagnosis, but may be negative up to 30% case of active pulmonary TB. . In some cases even though clinical and radiological features are typical of PTB,sputum CBNAAT is negative. Microbiological confirmation of pulmonary tuberculosis (TB) is important because of emergence of multi-drug resistance. Alternative methods of obtaining sputum specimens are frequently needed in patients with radiological suspicion of TB who are sputum CBNAAT negative. The methods include – sputum induction (SI) and bronchoalveolar lavage (BAL). **Methodology:** An prospective observational study on 50 patients with clinical and radiological evidence of pulmonary TB with spontaneous sputum CBNAAT negative was done. Sputum induced with 20mL of 3%hypertonic saline solution and BAL fluid were sent for CBNAAT. **Results:** Out of 50 patients, induced sputumCBNAAT for Mycobacterium tuberculosis positive in 32/50(64%) patients and BAL fluid CBNAAT for Mycobacterium tuberculosis positive in 38/50 (76%)patients. All patients with induced sputumCBNAAT positive were also positive for BAL fluid CBNAAT.Among this 3 were diagnosed with rifampicin resistance. **Conclusion:** Sputum induction and BAL both offers an alternative approach in the diagnosis of spontaneous sputum cbnaat negative suspected pulmonary TB patients for sputum collection.Though BALCBNAAT yields higher results, sputum induction is a simple and rapid way with significant positivity rate.So all patients clinically and radiologically suspicious of tuberculosis with sputumCBNAAT negative must must be screened with induced sputumCBNAAT prior to BALCBNAAT which requires expertise.

KEYWORDS :

INTRODUCTION

Tuberculosis is a global health burden.

COVID-19 (above HIV/AIDS).Worldwide, TB is the 13th leading cause of death and the second leading infectious killer after

Multidrug-resistant TB (MDR-TB) remains as a public health crisis and a health security threat. Only about one in three people with drug resistant TB accessed treatment in 2020.

WHO recommends the use of rapid molecular diagnostic tests as the initial diagnostic test in all persons with signs and symptoms of TB as they have high diagnostic accuracy and will lead to major improvements in the early detection of TB and drug-resistant TB. Rapid tests recommended by WHO are the Xpert MTB/RIF Ultra and Truenaat assays.

Sputum CBNAAT remains as an important tool of diagnosis. Results are obtained from sputum samples in about 2hours which helps in early detection and treatment of TB patients.

It may be negative in about 30% case of active pulmonary TB. In some cases even though clinical and radiological features are typical of PTB, sputum CBNAAT is negative.

Microbiological confirmation of pulmonary tuberculosis (TB) is important because of emergence of multi-drug resistance.

Alternative methods of obtaining sputum specimens are frequently needed in patients with radiological suspicion of TB who are sputum CBNAAT negative. The methods include – sputum induction (SI) and bronchoalveolar lavage (BAL).

AIMS AND OBJECTIVES

To compare the results of Induced sputum CBNAAT and bronchial washings CBNAAT in the diagnosis of sputum CBNAAT negative patients suspected to have pulmonary tuberculosis.

MATERIALS AND METHODS

A prospective observational study was conducted in the Department of Pulmonary Medicine, Government General Hospital, Kakinada on 50 patients with clinical and radiological evidence of pulmonary TB with spontaneous sputum CBNAAT negative.

All patients were instructed to submit the spontaneously expectorated sputum. Once sputum CBNAAT is negative, then the patient is subjected to induced sputum and BAL fluid CBNAAT

Sputum induced with hypertonic saline and BAL fluid were sent for CBNAAT

Patients were nebulised with 20ml of 3% hypertonic saline for 20 mins and was asked to cough at each 5 mins interval and when urge to cough was present

Fiber optic bronchoscopy was performed after taking consent and their bronchoscopic specimens were sent for CBNAAT

Inclusion Criteria:

All cases above 18 yearsof age of either sex with symptoms suspicious of pulmonary tuberculosis along with Sputum CBNAAT negative were included.

Exclusion Criteria:

Patients not given consent for bronchoscopy

Sputum positive cases ,isolated extrapulmonary tuberculosis ,HIV positive patients and patients not fit for bronchoscopy procedure eg.t hose having refractory hypoxemia, bleeding disorders, cardiovascular instability, status asthmaticus and marked hypercapnia Old ptb patients.

Patients who are unfit to induce sputum for CBNAAT such as CVA patients, comatose patients.

RESULTS

Table 1(Gender Distribution Among Patients)

GENDER	TOTAL PATIENTS (n)	INDUCED SPUTUM CBNAAT POSITIVE	PERCENTAGE%	BAL CBNAAT POSITIVE	PERCENTAGE%
MALE	32	21	65%	23	71%
FEMALE	18	11	61%	15	83%
TOTAL	50	32	64%	38	76%

Among total patients (50) Males were 32 with 65% Induced CBNAAT positive(21) and 71% BAL CBNAAT positive(23) and 18 were Females with 61% induced CBNAAT positive(11) and 83% BAL

CBNAAT positive (15)

Table 2(Age Wise Distribution)

AGE GROUP (Years)	NO OF PATIENTS	INDUCED SPUTUM CBNAAT POSITIVE		BAL CBNAAT POSITIVE	
18-25	4	2	50%	2	50%
26-40	12	8	66%	9	75%
41-55	20	14	70%	16	80%
>55	14	8	57%	11	78%

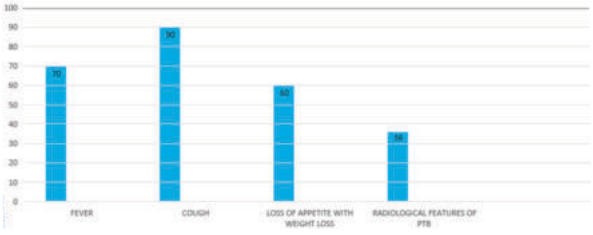
Majority of patients presented in age group (41-55yrs) among which 70% were Induced CBNAAT positive and 80% were BAL CBNAAT positive

Table 3(Radiological Presentation)

CXR FINDINGS	PATIENTS(N)	
NORMAL CXR	4	8%
INFILTRATION	23	46%
CONSOLIDATION	13	26%
CAVITY WITH INFILTRATION	15	30%
HILAR LYMPHADENOPATHY	2	4%

Most common presentation in chest x-ray was infiltration in (46%) followed by cavity with infiltration(30%)

Table 4(Clinical Presentation)



DISCUSSION

Sputum CBNAAT is a investigation with high specificity to diagnose pulmonary TB.

In about 1/3rd of the suspected PTB patients with sputum CBNAAT-negative, culture turns out to be positive

Conventional methods of mycobacterial cultures take 6-8weeks for results, resulting in a delay in starting the treatment.

DNA fingerprinting studies showed that 17% of the disease transmission could be from the Sputum CBNAAT Negative culture-positive patients.

In these cases, induced sputum and bronchial washings obtained using Fiber optic bronchoscopy may provide confirmation of a diagnosis of sputum negative pulmonary TB by obtaining specimens from specific sites in the lungs with infiltrates which can be sent for CBNAAT.

Out of 50 patients, induced sputum CBNAAT for Mycobacterium tuberculosis positive in 32/50(64%) patients and BAL fluid CBNAAT for Mycobacterium tuberculosis positive in 38/50 (76%)patients.

All patients with induced sputum CBNAAT positive were also positive for BAL fluid CBNAAT.

Among all the positive patients 3 were diagnosed with rifampicin resistance.

CONCLUSION

Sputum induction and BAL both offers an alternative approach in the diagnosis of smear-negative suspected pulmonary TB patients for sputum collection

Sputum induction was demonstrated to have given good diagnostic yield but it fell into disuse after FOB was introduced

In developing countries like India, the facilities of Bronchoscopy may not be available in all circumstances

Though BAL CBNAAT yields higher results, sputum induction is a simple and rapid way with significant positivity rate, all patients clinically and radiologically suspicious of tuberculosis with sputum CBNAAT negative must be screened with induced sputum CBNAAT prior to BAL CBNAAT which requires expertise.

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