

Gastric Lavage for Diagnosis of Pulmonary Tuberculosis

Dr. MAQBOOL AHMED

Fatima Jinnah Institute of Chest Diseases, (FJICD), Quetta/BMC, Quetta Balochistan

E-mail: maqboola93@gmail.com

Dr. ROZAL ASIF GICHKI

Bolan Medical Complex Hospital /BMC Quetta

E-mail: drrozalasif@gmail.com

Dr. FAHMIDA UMAR

Dr. KHALID AHMED

Prof. Dr. AISHA SIDDIQA

Bolan Medical Complex Hospital /BMC Quetta

E-mail: drfehmidanazir9@gmail.com

Abstract

Objective: To determine the estimated sensitivity of Gastric Lavage for patients diagnosis of pulmonary tuberculosis (TB) at Fatima Jinnah Institute of Chest Diseases, (FJICD), Quetta/BMC, Quetta Balochistan

Methods: A total number of 500 hospitalized patients in different units at Fatima Jinnah and chest hospital were tested for pulmonary tuberculosis. 53 patients were finally enrolled in the study and one gastric lavage specimen was taken from each patient.

Results: Amongst these 53 patients, forty four patients had positive gastric lavage results and 43 were positive on culture, while both positive results of smear and culture were matched in all patients proved to be suffering from pulmonary tuberculosis.

Conclusion: In our setup it is examine Gastric lavage can be a valuable alternative specimen instead of sputum for diagnosis of tuberculosis in children and elderly patients if both smear and culture results are applied.

Keywords: Pulmonary Tuberculosis, Gastric Lavage, Sputum.

INTRODUCTION

It is estimated there are around 1.3 million cases of tuberculosis in children under 15 years living in developing countries, with approximately 500,000 deaths annually. In Pakistan, 17% of reported TB cases occur in those under 5 years to 10 years old.¹ tuberculosis in children be considered a sentinel event from a public health perspective as it indicates recent infection due to exposure to an infectious person.² Children play a major role in the chain of tuberculosis transmission being reservoirs of *Mycobacterium tuberculosis* and may later develop active disease.³

Pulmonary tuberculosis in children has broad clinical presentations, from asymptomatic to severe disseminated forms, usually accompanied by severe cachexia,

which often leads to death.⁴⁻⁷ It is difficult to make an accurate bacteriological diagnosis of TB in children because those under ten usually have paucibacillary forms. Those over ten can present pulmonary TB with open (bacillary) lesions.⁸⁻¹¹

In this study, those cases of extra pulmonary TB, biopsy or lesion puncture can sometimes be performed, the study we evaluated the gastric lavage specimen in different age group patients to find out the possibility of its use as alternative specimen in children and elderly patients.

METHODS

A total number of 500 hospitalized patients suspected to have pulmonary tuberculosis who were admitted in different Units at Fatima Jinnah Chest and General hospital, from May 2021 to June 2022 were registered. Among these patients only 53 were selected for inclusion in the study based on the smear results of the sputum samples, culture and X-ray confirmation. The inclusion criteria was based on: Two smear-positive sputum and one smear positive sputum one smears positive sputum with isolation of organism from culture.⁴

Specimens: Gastric lavage samples were collected from each selected patient in the early morning after overnight fasting. These samples were sent to health reference mycobacteriology laboratory. Gastric lavage specimens were taken by inserting levine collection tubes through a nostril.⁵ Patients were instructed to swallow the tube. A syringe was attached to the end of the tube when it was fully inserted to collect 20 to 30 ml Gastric secretions. These samples were used for microscopic examination and culture.

Microscopic examination and culture: Smears were directly prepared to stain by Zeihl-Nelsen method for each specimen. In addition, all specimens were inoculated onto 2 slops of Lowenstein–Jensen and incubated at 35°C. Slops were examined for growth of *M. tuberculosis* for 8 consecutive weeks.⁶ Suspected colonies were examined for Acid Fast bacilli with Zeihl-Nelsen methods and confirmed by biochemical tests.

Decontamination procedure: Specimens were decontaminated by modified Petroff 's method using equal volume of 4% NaOH.⁶

RESULTS

Pulmonary tuberculosis was proved in 53 patients out of 500 on the basis on applied criteria in this study. Number of positive smears from gastric lavage specimens were 44 in which culture was positive in 34 cases and negative in the rest 10 samples. Nine smear negative samples had also positive culture results. (Figure no. 1)

Figure - I: Results of gastric lavage examination in 53 pulmonary tuberculosis

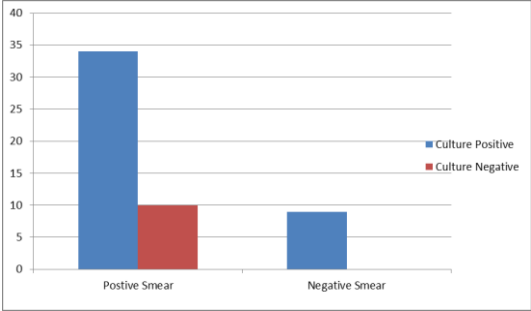


Table-1: Positive rate of tested gastric lavage samples in different age groups

Age	No. Patients	Slide		Culture	
		Positive	Negative	Positive	Negative
0-9	5	4	1	3	2
10-19	6	4	2	4	2
20-29	12	12	-	11	1
30-39	7	6	1	7	0
40-49	12	9	3	11	1
50-59	1	1	-	1	-
60					
& over	10	8	2	6	4
Total	53	44	9	43	10

DISCUSSION

Gastric lavage specimens in diagnosis of pulmonary tuberculosis,Each patient had one sputum smear positive at least. One collected gastric lavage specimens was examined by direct examination for acid fast bacilli (AFB) and culture. The yield of AFB and culture were 44/53 (83.01%) and 43/53 (81.13%) respectively. Comparison of the yield of combined AFB and culture in all patients proved to be suffering from pulmonary tuberculosis revealed 100% sensitivity, while these two methods were matched with each other in 34/53 (64.15%) of cases (Figure-I). It is reported that sputum smear negative patients may have positive smear in gastric lavage⁷ but the yield of AFB has not been fully investigated on patients with sputum smear. In one study the yield of one sputum smear is reported to be similar to three gastric lavage and reported to have higher efficiency in children.⁸

Primary diagnosis of TB by sputum specimens. Rizvi⁹ has reported that the yield of AFB increased to 90% on direct smear of gastric lavage when results of first and sec-one sample were combined.

All positive smears to have positive culture results too. Our investigation proved that long delay occurred from collecting samples to sending it to the laboratory because samples had been collected from hospitalized patients in different area of the city. None of the samples was neutralized by sodium bicarbonate after collection. Mycobacterium is sensitive to gastric acid and will become inactive after long exposure. It is reported that if sodium bicarbonate was added to gastric lavage sample, yield of AFB will be increased.⁶ Analysis of results reveal that none of the AFB and culture methods were able to provide 100% sensitivity in all age group patients except AFB in

3-10 years old. The highest sensitivity rates of the culture were in adults 6-7 years old. It seems sensitivity of gastric lavage to be lower in these two groups compared with other patients. It has been recommended that gastric lavage can be a suitable alternative sample for sputum.^{10,11}

CONCLUSION

The Gastric lavage would be a helpful alternative specimen if combination of AFB and culture is to be considered. However, further studies are needed to confirm the findings of this study.

REFERENCES

1. Woods G. The mycobacteriology laboratory and new diagnostic techniques. *Infect Dis Clin North Am* 2002;16:127-43.
2. Perez-Guzman C, Vargas MH, Torres-Cruz A. Does aging modify pulmonary tuberculosis? A meta-analytical review. *Chest* 1999;116:961-7.
3. Pozniak AL, MacLeod GA, Ndlovu D. Clinical and chest radiographic features of tuberculosis associated with human immunodeficiency virus in Zimbabwe. *Am J Respir Crit Care Med* 1995;152:1558-61.
4. Escreet BC, Cowie RL. Criteria for the diagnosis of pulmonary tuberculosis. *S Afr Med J* 1983;63(22):850-4.
5. Chritie JD, Donald. The Laboratory diagnosis of mycobacterium disease. *Clin Lab Med* 1995; 15:279-303.
6. Collins CH, Grange JM, Yates MD. Tuberculosis bacteriology, organization and practices. Butterworth Heiemann press 2nd Ed 1997;50-68.
7. Okutan O, Kartaloglu Z, Kilic E, Bozkanat E, Ilvan A. Diagnostic contribution of gastric and bronchial lavage examinations in cases suggestive of pulmonary tuberculosis. *Yonsei Med J* 2003;30(44):242-8.
8. Zar HJ, Hanslo D, Apolles P, Swingler G, Hussey G. Induced sputum versus gastric lavage for microbiological confirmation of pulmonary tuberculosis in infants and young children: A prospective study. *Lancet* 2005;365:130-4.
9. Rizivi N, Rao NA, Hussain M. Yield of gastric lavage and bronchial wash in pulmonary tuberculosis. *Int Tuber Lung Dis* 2001;2:147-51.
10. Berean K, Roberts FJ. The reliability of acid fast stained smear of gastric aspirate specimens. *Tuber Lung Dis* 1988;70:151-2.
11. Somu N, Swaminathan S, Paramasivan CN. Value of bronchialveolar lavage and gastric lavage in the diagnosis of pulmonary tuberculosis. *Tuber Lung Dis* 1995;76:295-9.