

VALUE OF GASTRIC LAVAGE FOR DIAGNOSIS OF PULMONARY TUBERCULOSIS

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ABSTRACT

Objective: To evaluate the sensitivity of gastric lavage specimen for observation of acid fast bacilli and isolation of mycobacterium in patients proved to be suffering from pulmonary tuberculosis.

Patients and Methods: A total number of 886 hospitalized patients in different hospitals of Urmia City were tested for pulmonary tuberculosis. Fifty-three patients were eventually enrolled in the study and one gastric lavage specimen was taken from each patient.

Results: Among these fifty three, 44 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. The highest positive rate was in 20 to 49 and 20 to 29 years for the culture and smear respectively but the lowest culture positive rate was in those patients who were in children and those over 60 years of age.

Conclusion: 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.

KEY WORDS: Gastric Lavage, Pulmonary Tuberculosis.

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INTRODUCTION

Tuberculosis (TB) is today considered as the most important health problem especially in developing countries. It is estimated that one third of the world's population (almost 95% from developing countries) is infected with Mycobacterium tuberculosis, Accurate diagnosis of pulmonary tuberculosis is still under investigation and value of different samples are being discussed.¹ The diagnosis of pulmonary tuberculosis in children and elderly people is based mainly on clinical and radiographic

features supplemented by a positive history or contact and tuberculin test results.² Bacteriological confirmation of TB in children is very difficult to achieve because of the difficulty in collecting sputum.³ In this 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.

PATIENTS AND METHODS

A total number of 886 hospitalized patients suspected to have pulmonary tuberculosis who were admitted in different hospitals of Urmia city, from May 1998 to February 2003 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:

1. Two smear-positive sputum
2. One smear positive sputum One smears positive sputum with isolation of organism from culture.⁴

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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.

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

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.

RESULTS

Pulmonary tuberculosis was proved in 53 patients out of 886 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.

Pulmonary tuberculosis in different age groups: Culture positive results were studied in different age groups. The highest positive rate was

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

	Culture Positive	Culture Negative	Total smear result
Positive Smear	34	10	44
Negative Smear	9	-	9
Total culture result	43	10	53

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

Age (year)	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

in 20-49 years old, but the lowest culture positive rate was in those patients with 60 years old (6 out of 10) and children.

DISCUSSION

We studied the value of 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 (Table-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

The yield of AFB results could be increased if more than one gastric lavage sample is examined as it is used in 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 second sample were combined.

We expected 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 20-29 years old. The highest sensitivity rates of the culture were in adults 20-49 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

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

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