



Diagnosis of Anorectal Tuberculosis by Polymerase Chain Reaction, GeneXpert And Histopathogenesis in Anal Fistula Patients

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Key words:

Anorectal Tuberculosis, Polymerase Chain Reaction, GeneXpert, Histopathogenesis, Fistula Patients

Abstract

Background: Association of tuberculosis (TB) with anal fistulas can make its treatment quite difficult. The main challenge is timely detection of TB in anal fistulas and its proper management. There is little data available on diagnosis and management of TB in anal fistulas.

Objective: To detect TB in fistula-in-ano patients were analyzed in different methods utilized.

Methods: It was a prospective study conducted in Department of Colorectal Surgery, Bangabandhu Sheikh Mujib Medical University and Department of Surgery & Pathology, Sir Salimullah Medical College Mitford Hospital, Dhaka. Total 258 cases were included in this study during the period January 2018 to December 2020. The sampling was done for tissue (fistula tract lining) and pus (when available). The detection rate of various tests to detect TB and prevalence rate of TB in simple vs complex fistulae were studied.

Results: This study shows 84.1% were non TB fistula and 15.9% were TB fistula. Majority were male between non TB fistula and TB fistula which was 87.1% and 85.4% respectively. TB fistulas were more complex than non-tuberculous fistulas (68.3% vs 44.2%) respectively. TB was detected in (7.4%) samples tested by PCR-tissue, 23.6% samples tested by PCR-pus, (1.6%) samples tested with HPE-tissue and 0.8% samples tested by GeneXpert.

Conclusion: This study shows the detection of TB by polymerase chain-reaction was higher than by histopathology and GeneXpert. Amongst polymerase chain-reaction, pus had a higher detection rate than tissue. TB fistulas were more complex than non-tuberculous fistulas but aggressive diagnosis and meticulous treatment led to comparable overall success rates in both groups.

Introduction

Tuberculosis (TB) is quite common in several regions of the world. Though pulmonary TB is the most common and accounts for 80% cases of all TB cases, extrapulmonary TB is also not rare and occurs in 20% of patients. Amongst extrapulmonary TB, perianal TB occurs in 0.7% of them.¹

Anal fistulas, especially the complex fistulas, are notorious for high recurrence rate and refractoriness to treatment.² There are various causes responsible for non-healing and recurrences of fistulas, and inability to detect TB is one of them.² There are several diagnostic tests in vogue to detect TB in anal fistulas. The most common and one of the oldest methods is histopathology

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(HPE).¹ Several new tests have also been developed in last three decades but most of them have fallen out of favor. The only tests which demonstrate better detection rate than HPE are polymerase chain-reaction (PCR) and GeneXpert.³ However, there are only a few studies which have tested the efficacy of PCR or GeneXpert in detecting TB in anal fistulas.⁴ Even fewer studies have compared HPE with PCR in detecting anorectal TB.¹

Materials and methods

It was prospective study conducted in Department of Colorectal Surgery, Bangabandhu Sheikh Mujib Medical University and Department of Surgery & Pathology, Sir Salimullah Medical College Mitford Hospital, Dhaka. Total 258 cases were included in this study during the period January 2018 to June

2020. The sampling was done for tissue (fistula tract lining) and pus (when available). The detection rate of various tests to detect TB and prevalence rate of TB in simple *vs* complex fistulae were studied. Collected data were edited after data were analyzed using computer based programme statistical package for social science (SPSS) for windows version 20.

Results

Table-I

Prevalence of TB fistula of study subjects (n=258)

	No. of patients	Percentage (%)
Non-TB fistula	217	84.1
TB fistula	41	15.9

Table II

Patient demographics and fistula characteristics (n=258)

Characteristics	Non-TB fistula(n=217)		TB fistula(n=41)		P value
	No	%	No	%	
Age	38.72±12.40	39.86±12.51	0.173		
Sex					
Male	189	87.1	35	85.4	0.702
Female	28	12.9	6	14.6	

Table III

Proportion of complex and simple fistulas in non-tuberculosis and tuberculosis fistula groups (n=258)

Characteristics	Simple fistulas (fistulotomy possible)		Complex fistulas (fistulotomy not possible)		P value
	No	%	No	%	
Non-TB fistula	121	55.8	96	44.2	0.001
TB fistula	13	31.7	28	68.3	

Table IV

Outcome of tested samples (tissue and pus) tested

PCR-Pus (Total No -258/ positive for TB)	PCR-Tissue (Total No. / positive for TB)	HPE (Total No./ positive for TB)	GeneXpert (Total No./ positive for TB)
61(23.6%)	19 (7.4%)	4(1.6%)	2(0.8%)

Discussion

In this study, TB was detected in (7.4%) samples tested by PCR-tissue, 23.6% samples tested by PCR-pus, (1.6%) samples tested with HPE-tissue and 0.8% samples tested by GeneXpert. This rate of prevalence of TB infection is within the range (0.3%-16%) of reported rates in endemic areas as published in previous studies.^{1,2,5} Therefore, timely identification of associated TB in anal fistulas holds immense importance. Unfortunately, the conventional tests performed for TB have distinct limitations. The detection rate of acid fast bacillus smear is quite low. TB culture is very specific and can also guide regarding drug resistance but its processing period is quite long (6 wk to 6 mo). Therefore, the practical utility of TB culture is quite limited. The sensitivity and specificity of HPE to detect TB is also not very high as has been reconfirmed in the present study. Therefore, in the last two decades, a lot of studies recommended that PCR should be employed routinely to detect TB.⁶ GeneXpert has the added advantage that it diagnoses Rifampicin-sensitivity at the same time.²

The fistulas associated with TB were significantly more complex than fistulas without TB infection (68.3% vs 44.2%) respectively. Several previous studies have also documented that TB fistulas are associated with higher proportion of multiple tracts^{3,6,7} and recurrent fistulas.^{2,3,8} So, the increase in TB detection rate by PCR and HPE in the present study is not significantly different from the previous published study and seems to be a random variation.

Conclusion

This study shows tuberculosis (TB) is associated with more complex fistulas but timely diagnosis and treatment leads to similar overall success rates as for non-TB fistulas. Failure to detect TB in time increases the risk of recurrence. Anti-TB therapy started more than 6 wk after surgery increases the risk of recurrence. In patients with initial

negative test result for TB but with high levels of suspicion (non-healing of fistula, occurrence of new abscesses during treatment or delayed recurrences), additional repeat samples may be needed to detect TB. Pus is more sensitive than tissue samples to detect TB. PCR is more sensitive than histopathology and GeneXpert to detect TB in anal fistulas. Therefore, PCR should be done in every fistula patient especially in TB endemic regions. As PCR cannot distinguish dead from viable mycobacteria, correlation with the clinical picture is mandatory.

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