

COMPARISON OF RAPID SLIDE CULTURE AND CONVENTIONAL LJ METHOD FOR DETECTION OF TB FROM SUSPECTED CASES OF TUBERCULOSIS

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ABSTRACT

Tuberculosis is one of the dangerous disease in the world and its spreading very fast. There is emergence Drug resistance TB (MDR, XDR and TDR) because of many reasons. Transmission of MDR and XDR will be curse to human being. The objective of this study is to compared the Rapid slide culture (RSC) method with the growth on Lowenstein Jensen(LJ) media and to know the sensitivity and specificity of the rapid slide culture method. Total 100 sample was collected from suspected pulmonary tuberculosis cases. All the sample were subjected to three test:1.Zeihl Neelsen Staining 2. Rapid slide culture 3. Culture on Lowenstein Jensen media and the result were compared. Of the total 100 suspected sputum samples which were tested by all three methods, 57 samples were found to be Smear

positive, 64 were found to be positive by the RSC method, 68 samples were found to be positive by the LJ culture method. The sensitivity of RSC was 91.17% specificity was 93.75%. Diagnosis can be done within 1 week with RSC where as 3-4 weeks by Conventional culturing method. So this method can be used in routine and especially in patient who have symptom of TB and have Negative smear of acid fast bacteria.

INTRODUCTION

tuberculosis is one of the ancient diseases and it is called a diseases of poverty. It continues to be a leading cause of mortality and morbidity in developing countries.^[1] India is the country with the highest burden of TB. The World Health Organisation (WHO) statistics for 2014 give an estimated incidence figure of 2.2 million cases of TB for India out of a global

incidence of 9 million Its early detection and effective treatment , therefore are necessary for controlling this problem.^[3]

Diagnosis is confirmed by microscopy examination and culture for growth of *mycobacterium tuberculosis* in developing countries because of low cost.

Of these two method microscopy examination is less sensitive. It detect Acid fast bacilli on specimen containing 10,000 bacilli per ml. conventional culture method is gold standard method. It give positive result on a clinical specimen containing as low as 10-100 bacilli per ml. for primary detection conventional method takes 4 weeks.^[4]

For these reason many scientist to look for quicker methods of culture, such as rapid slide culture (RSC).

This method was first used by Robert Koch using coagulated human serum and he was successful in obtaining the growth of M Tb in seven days.^[5]

Dickinson and mitchison used RSC method. They use outdated citrated human blood as medium and fluorescent staining.^[6]

we replaced the medium to Middle brook 7H9 broth with growth supplement OADC and PANTA as decontaminant. singh et al., 2012 used this method but he used culture tube we replaced this tube with McCartney bottle and ZN staining was performed.

In this study RSC method is compare with conventional method and microscopy for primary detection.

MATERIAL AND METHOD

100 samples were collected in the morning in sterile vial from suspected TB patient.

Two thick smear were made one on the middle of the glass slide(slide A) and another over the lower part of the glass slide which cut half longitudinally (Slide B).

Than sample were processed by modified petroff's method from that two LJ slant were streak and incubated at 37 c for 4-5 week. Slant was observed twice in a week.^[7]

Slide A was air dried, heat fixed and stained by ZN staining method. The result of microscopy were recorded.

Rapid slide culture (RSC)

7 ml 7H9 medium with OADC-PANTA supplement was pour into sterile glass McCartney bottle. Slide B was placed in the bottle in such a way that whole smear was covered by liquid medium. These bottles were incubated at 37 c for 7 days. After 7 days slide was removed from bottle, air dried and heat fixed. This slide was processed for ZN staining. Result of ZN staining was recorded.

RESULT

Table 2.1 positive cases according to the test

Detection method	positivity	Percentages
Smear microscopy	57	57%
RSC	64	64%
LJ culture	68	68%

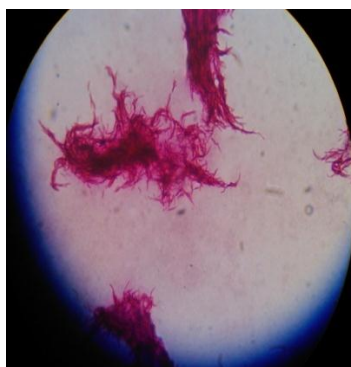
100 sample were analyzed of these 73 sample were positive by one or more test and 26 samples were negative by all three test, 57 samples were positive by smear microscopy, 64 samples were positive by RSC and 68 cases by LJ culture.

Table 2.2 overall correlation between RSC and LJ culture

			LJ culture	
		Positive	negative	Total
RSC	positive	62	2	64
	negative	6	30	36
	Total	68	32	100



(a)



(b)

Fig 2.1(a) growth on LJ (b) cord formation by rapid slide culture method

Correlation the result of both these method in studied in 100 patient which was shown in the table 2.2. 62 samples were positive by both test. 2 samples were only positive by RSC test. 10 samples were positive only by LJ method. 30 samples were negative by both test.

Sensitivity of RSC method was 91.17% and specificity was 93.75% .Time for the diagnosis is much lower than Conventional LJ culturing. diagnosis can be done within 1 week by RSC method where as LJ method it took 3-4 weeks for diagnosis.

DISCUSSION

Early diagnosis and effective treatment of the tuberculosis is necessary for control the TB. In developing countries direct smear examination has been a backbone of any tuberculosis control programme. But there is drawback of ZN smear examination –its less sensitivity. Conventional culture method is gold standard method but have one disadvantages. It takes long time for growth. These may lead to a delay in the start of treatment and it also facilitating the spread of the disease.^[4]

The rapid slide culture method was described in 19th century by Robert Koch. He was successes full to cultivate organisms in the human blood medium but there was a problem of contamination. Use of middle brook 7H9 broth with OADC as growth supplement and PANTA as decontaminant gave the good result. This rapid slide culture method is compare with conventional method and smear microscopy, RSC is capable to detect AFB 12-14% in smear negative cases Present study shows 91.17% sensitivity and 93.75% specificity. The study conducted by Hemavati et al., 2012 found 88.88% sensitivity and 97.8% specificity using rapid slide culture method and Muddaiah (2013) found 88% sensitivity and 100% specificity.^[8] RSC proved to be a rapid, cheap and effective method for obtaining culture

confirmation of tuberculosis and need not requiring any sophisticated instrument. cost of RSC per sample was very less as compare to conventional method.^[4] Time for diagnosis was 1 week using RSC where as 3-4 weeks using Conventional method. RSC gave result in one week(Hemavathi et al., 2012; ravish Muddaiah et al., 2013; J.Jena et al., 1992; sanjeev et al., 2012).^[4,8,9]

Rapid slide culture showed good sensitivity which was comparable to efficacy of LJ culture and this technique can be adopted in the Revised National Tuberculosis Control Program (RNTCP) as it is a rapid, cheap, sensitive and specific method.

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