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Original Research Paper

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# A STUDY OF DETECTION OF PYOGENIC NON-TUBERCULOUS BACTERIA IN CASES OF PULMONARY TUBERCULOSIS

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| **Dr. Rajiv Kumar** | Assistant Professor, Department of Pulmonary Medicine, M.L.B. Medical College, Jhansi |
| **Dr. Ram Babu*** | Associate Professor, Department of Medicine, M.L.B. Medical College, Jhansi *Corresponding Author |
| **Dr.anita** | Junior Resident Department of Medicine, M.L.B. Medical College, Jhansi |

**ABSTRACT**

**OBJECTIVES:** The present study IS being undertaken with the purpose of – To find out the bacterial flora of upper and lower respiratory tract in cases of pulmonary tuberculosis. **MATERIAL AND METHODS:** The present study was conducted on patients of pulmonary tuberculosis admitted to the wards of Maharani Laxmi Bai Medical College, Jhansi during February 2018 to April 2019. The diagnosis of pulmonary tuberculosis was made on the basic of history, clinical examination, radiological evidence and detection of tubercle bacillus from sputum examination. **RESULTS:** A total number of 60 patients of pulmonary tuberculosis were studied to elucidate the presence of pyogenic non-tuberculous bacteria in these cases. More than 60% of cases were from rural areas. Females mostly were housewife while male patients were mostly labourers. The socio-economic status of the study group (50%) patient were in the social class IV and 31.6% patient were in class V and 16.6% patients were in class III. Some patients have positive family history. 20% patients were having symptoms from less than 3 months. 100% cases having hemoglobin less than 11.5% gm%, total leucocyte count was increased. Acid fast bacilli in the sputum was positive in 68.3% cases. potential pathogens were preset in 65% of cases. 48.3% yielded potential pathogens in their throat swab and 39 (65%) in sputum culture. Staphylococcus aureus Klebsiella, pseudomonas, Pneumococcus and proteus was seen in throat swabs and sputum. **DISCUSSION:** In this study the pulmonary tuberculosis mainly affected lower socio- economic groups. Family history of tuberculosis is mainly concerned with a history of contact. In this study cough, expectoration and loss of appetite were the man features and were present in almost 100% cases. Appearance of symptoms depends primarily upon the state of natural resistance, allergic hypersensitivity and the virulence of the infective organism. Moreover symptoms may persist even after the lesions is healed, as in residual bronchiectasis fibrosis, chronic bronchitis, and secondary infections. In present study acid fast bacilli in sputum were positive in 68.3% cases. This present study is limited to the isolation in sputum and in throats swab of pyogenic organism only. Inspite of these limitations it was possible to established a fair degree of certainly of presence of non tuberculous pyogenic bacteria in case of pulmonary tuberculosis.The finding of study emphasize that sputum is still an adequate material to isolate pathogens. The microorganism could be grown from 64.7% specimen of sputum. The present study shows predominantly Staphyllococcus Aureus, Klebsiella, Pseudomonas, Pneumococcus and Proteus.Conclusion: It could be concluded that in the management of pulmonary tuberculosis one must dispense with routine bacteriology as a guide to therapy and to select suitable antibiotic against specific pathogens.

**KEYWORDS :** Pulmonary tuberculosis, Non tubercular bacteria, Clinical presentation, Risk factors, Effect on mortality

## INTRODUCTION:

Tuberculosis, one of the major public health problems in the developing countries of the world today have made its impact felt throughout the ages. No other disease has so much sociological, economic and health significance as tuberculosis.

Of the eight million people who developed tuberculosis in 1990, 95% were from developing countries. The situation is likely to become worse and the forecast for this decade is that 88 million new cases of tuberculosis are likely to emerge world over and over 30 million deaths are likely to occur.

About one third of the world's population in infected by mycobacterium tuberculosis. Worldwide in 1995 there were about nine million new cases of tuberculosis with three million deaths.

Mycobacterium, Tuberculosis kills more people than any other single infectious agent. Deaths from tuberculosis comprise 25% of all unavoidable deaths in developing countries. 95% of tuberculosis cases and 98% of tuberculosis deaths are in developing countries. 75% of tuberculosis cases in developing countries are in the economically productive age group (15-50 years) (WHO, 1997).

Of all the manifestations of the tuberculosis pulmonary tuberculosis gets the maximum attention. There is however, justification, 'for the importance" given to pulmonary diseases, since it is the most frequent of all manifestations and is practically the only manifestation which is infectious.

The mortality in pulmonary tuberculosis usually occurs either due to tubercular toxaemia or due to progression of tuberculous lesion leading to respiratory insufficiency from supervening bronchitis, bronchiectasis, emphysema and secondary infections.

In normal subjects the lower respiratory tract is bacteriologically sterile (Lees and Me Naught, 1959). The upper respiratory passages however normally contain a variety of microogranisms including bacteria and fungi which may be potentially pathogenic if they invade lower respiratory tract. Although transient contamination of the lower respiratory tract with the organisms from oropharynx is not infrequent, particularly during sleep, these inocula are rapidly eliminated on account of the excellent defense mechanisms in the lungs. Altered local defence mechanism and impaired mucocillary clearance in patients with bronchitis as well as in pulmonary tuberculosis may permit extension of the' normal oropharyngeal flora into the lower respiratory tract, causing further destruction of lung.

The association of pulmonary tuberculosis with secondary

infections may be seen very commonly in India ( Gularia et al.,, 1969) .

Due to invasion of secondary pathogenic organisms in the lower respiratory tract among the tuberculous patients in whom there is already poor defense mechanism, there is aggravation of the symptoms which results in progressive breathlessness, cough, large amount of expectoration some time associated with haemoptysis and fever. Radiological deterioration may also be seen in serial radiography due to parenchymal destruction caused by secondary organisms. Therefore, in the management of pulmonary tuberculosis, secondary infections must get due attention as this may also lead to false interpretation of MDR tuberculosis because of deterioration in the condition inspite of adequate antitubercular chemotherapy both clinically arid radiologically.

## AIMS AND OBJECTIVES:

The present study is being undertaken with the purpose of –

- To find out the bacterial flora of upper and lower respiratory tract in cases of pulmonary tuberculosis.

## MATERIALS AND METHODS:

The present study was conducted on patients of pulmonary tuberculosis admitted to the wards of Maharani Laxmi Bai Medical College, Jhansi during February 2018 to April 2019.

The diagnosis of pulmonary tuberculosis was made on the basic of history, clinical examination, radiological evidence and detection of tubercle bacillus from sputum examination.

Cases who were sputum positive for acid fast bacilli and cases of pulmonary tuberculosis having a negative sputum examination for tubercle bacillus having three or more of' the following criteria were included.:-

- Clinical presentation compatible with tuberculosis
- History of contacts from tuberculous patients
- Strongly positive tuberclin skin test.
- Radiological evidence of lesion compatible with tuberculosis.
- Radiological lesion not responding to antibiotic therapy.

All patients were subjected to clinical history including age, sex, total duration of illness, family history and symptoms like fever, cough expectoration, breathlessness, chest pain, haemoptysis & loss of appetite. Detailed general examination and physical examination were done. General examination included

Pulse rate, respiratory rate, blood pressure, pallor, cyanosis, clubbing, oedema, lymphadenopathy. Detailed clinical examination of respiratory system was done by inspection, palpation, percussion and auscultation.

## ALL THE PATIENTS WERE SUBJECTED TO FOLLOWING INVESTIGATIONS:-

- Haemoglobin estimation
- Total leucocyte count
- Differential leucocyte count
- Urine for albumin, sugar and microscopy
- Tuberculin skin test
- Sputum for acid fast bacilli
- Gram's staining
- X-ray chest PA View
- Sputum and Throat swab culture and, sensitivity.

From each patients throat swabs and sputum were collected by standard techniques.

In early morning, throat swab was made after through mouth wash and sputum was collected in a sterile culture tube by asking the patient to cough in a tube.

Gram's stain smear was prepared from sputum which was then examined for gram positive or and gram negative bacteria.

## GRAM'S STAINING:

- Sputum smear was made dried, and fixed by heating
- Gentian violet poured on it and wait for I minute
- Gram's", iodine was poured on it and wait for one minute
- Wash the slide with water.
- Decolourised the smear with acetone within 2-3 seconds
- Wash the slide with water.
- Counter stained the slide with 0.5% safranine for I minute
- Again wash the slide with water
- Allowed to dry and then studied.
- Gram positive organisms were stained dark violet in colour where as
- Gram negative organism were stained pink in colour.
- Sputum examination for Acid Fast Bacilli was done by Ziehl
- Sputum smear was made, dried and fixed by flaming
- Slide was covered with Carbol Fuchsin and heated until steam arises. Allow the preparation to stain for 5 minutes. Heat was applied at intervals to keep the stain hot
- Wash the slide with water
- Cover the slide with 200/0 sulphuric acid. After about a
- minute in the acid wash the slide in water and pour on more acid. Repeat this process several times. The declourization was finished when after washing' the film is only very faintly pink.
- Wash the slide with water.
- Counterstain the slide with Loffler's methylene blue for 15 - 20 seconds.
- Wash, blot, dried and mount the slide.
- Acid fast bacilli stained bright red in colour, while the tissue, cells and other organisms were stained blue in colour.

## CULTURE AND SENSITIVITY OF SPECIMEN

- Within one hour of collection, sample was inoculated on to blood agar media which was incubated at 37°C for 24 hours. This enhanced the growth and mucoid characteristics of Pneumococci while also allowing the primary identification of Staphylococcus, Streptococci, Haemophilus influenzae and Coliform organism.
- At the same time 'all specimens were 'inoculated onto nutrient agar media.Incubation was carried out at 37°C for 24 hours.
- If growth does not occur it means culture is sterile for secondary organisms and if growth occurs then it shows that culture is positive for secondary organisms.
- Final identification was done by their motility and standard biochemical test, which are described below and sensitivity was done by various antibiotic susceptible test disc.

## PHEUMOCOCCUS :

Streptococcus pneumonia is a gram positive encapsulated organism that usually grows in pairs or short chains. Diplococcus form in lancet shaped. Pneumococcal colonies are surrounded by Greenish discolouration on blood agar and are confused at time with other alpha – hemolytic streptococci such as streptococcus viridians. Pneumococci can be distinguished by their bile solubility and optochin disk sensitivity test.

## STREPTOCOCCUS PYOGENS :

Group A streptococci are gram positive cocci which but more commonly occur as chains in specimens. They are caalase negative, aerobic but are some time facultative anaerobes. On blood agar plates, they appear as white to gray colonies 1

to 2 mm in diameter surrounding by zones of complete hemolyiss or beta hemolysis. Bacitracin disc sensitivity is used for routine identification, but is by no means specific antiser.

**STAPHYLOCOCCUS AUREUS :**

It is gram positive coccus. On gram stain, organism are usually in clusters, but can occur singly or in pairs. On blood agar plats, colonies appear golden yellow, hence the name aureus Test that differentiate S. Aureus from the less pathogenic species S. Epidermidis (coagulase – ve) and S. Saprophyticus re the coagulase and Mannitol fermenting test. More than 95 percent of pathogenic staphylococci produce coagulase.

**HEMOPHILUS NFLUENZAE:**

Hemophilus influenza is an aerobic gram negatve pleomorphic organism. They are unencapsulated. These strains are present in the mucoid sputum of 50 to 60 percent of patients with chronic bronchitis.

Capsulated strain are found less commonly. Haemophilus influenza requires both X and V factors for growth. These requirements particularly V factors are available I or heat disrupted erythrocytes (LEVINTHAL's agar and chocolate agar). Thus organism growth poorly if at all on ordinary blood agar because of the unavailability of V factor.

**KLEBSIELLA:**

Klebsiella species are encapsulated gram negative bacilli. Strain of Klebsiella uusly are nonmotile and form large mucoid colonies on solid media. Strain of Klebsiella can be further distinguished on the basis of type – specific capsular antigens.

**ESCHERICHIA COLI:**

It is a group of gram negative non sporing rods. They generally ferment lactose, as opposed to the nonlactorse fermenting organism, such s salmonella, Shigella and proteus.

**PROTEUS:**

It consists of gram negative bacilli which do not ferment lactose and are characterized by their active motility and spreading growth on solid media.

**PSEUDOMONAS:**

Pseudomonas aeruginosa is a gram negative motile road. It grows readily in all ordinary culture media and on agar it forms irregular, shaft iridescent colonies which usually have a fluorescent yellow green color due to diffusion into medium of two pigments, pyocyanin and fluorescin. Pseudomonas produces acid but no gas in glucose, and it is protecolytic. It is oxidase positive and produce ammonia from arginine.

**RESULTS:**

A total number of 60 patients of pulmonary tuberculosis were studied to elucidate the presence of pyogenic non-tuberculous bacteria in these cases. The analysis henceforth will attempt to establish the role of bacterial flora of upper and lower reparatory tract in pulmonary tuberculosis

**TABLE 1: SHOWING THE AGE AND SEX DISTRIBUTION OF THE STUDY GROUP**

| Age Group | Male | | Female | |
|---|---|---|---|---|
| | No. | % | No. | % |
| 10-20 | 6 | 19.3 | 2 | 6.8 |
| 21-30 | 16 | 51.6 | 14 | 48. |
| 31-40 | 4 | 12.9 | 9 | 31.0 |
| 41-50 | 1 | 3.2 | 3 | 10.3 |
| 51-60 | 2 | 6.45 | 1 | 3.4 |
| 61-70 | 2 | 6.45 | 0 | 0 |
| Total | 31 | 100 | 29 | 100 |

Table-1 shows the age wise breakup of cases. About half of the male and female patients falls in the age group of 21-30 years.

**SEX:**

Table-1 also shows sex wise breakup of the cases. There were 31 (51.6%) males and 29 (48.3%) females.

**TABLE-2- SHOWING RURAL AND URBAN DISTRIBUTION OF CASES**

| Habitate | No. of cases | % |
|---|---|---|
| Rural | 37 | 61.6 |
| Urban | 23 | 38.3 |
| Total | 60 | 100 |

Table-2 shows that more than 60% of cases were from rural areas.

**TABLE-3: SHOWING OCCUPATION STATUS OF THE STUDY GROUP.**

| Habitate | No. of cases | % |
|---|---|---|
| House wife | 24 | 40 |
| Labourer | 28 | 46.6 |
| Office worker | 02 | 3.3 |
| Student | 06 | 10 |
| Total | 60 | 100 |

Table-3 shows the occupational status of the pulmonary tubercular patients in females mostly were housewife while male patients were mostly labourers.

**Table 4: Showing socio-economic status of the study group.**

| Social class | Mean/Capital income Rs./months | No. of cases | % |
|---|---|---|---|
| I | 1590 – >1590 | 0 | 0 |
| II | 800 – 1589 | 1 | 1.6 |
| III | 480 – 799 | 10 | 16.6 |
| IV | 250 – 479 | 30 | 50.0 |
| V | < 250 | 19 | 31.6 |
| Total | 60 | 100 | 100 |

Based on the classification of B.G. Prasad (1995). His classification is a modification of 1960's classification given by B.G. Prasad.

Table-4 shows the socio-economic status of the study group (50%) patient were in the social class IV and 31.6% patient were in class V and 16.6% patients were in class III.

**Table-5: Showing family history of pulmonary tuberculosis**

| Family history | No. of cases | % |
|---|---|---|
| Positive | 10 | 16.6 |
| Negative | 50 | 83.3 |
| Total | 60 | 100 |

Table-5 shows that 16.6% cases were having positive family history of pulmonary tuberculosis.

**Table 6: showing the duration of illness in the study group.**

| Duration of illness | No. of cases | % |
|---|---|---|
| 0 – 3 | 12 | 20.0 |
| 4 – 6 | 11 | 18.3 |
| 7 – 12 | 13 | 21.6 |
| 13 – 24 | 9 | 15.0 |
| 25 – 36 | 6 | 10.0 |
| 30 – 60 | 4 | 6.6 |
| > | 5 | 8.3 |
| Total | 60 | 100 |

Table-6 shows that 20% patients were having symptoms from less than 3 months and 18.3% patients having duration of illness ranging from 4-6 months and 21.6% patients having

duration of illness ranging from 17-12 months, 15% patients having symptoms from 13-24 months % rest of the patient having duration of illness ranging from 25- > 60 months.

**Table 7: Having the symptomatoloy of the cases of the study group.**

| Symptoms | No. of cases | % |
|---|---|---|
| Fever | 55 | 91.6 |
| Couth | 60 | 10 |
| Expectoration | 60 | 100 |
| Chest pain | 36 | 60 |
| Breathlessness | 37 | 61.6 |
| Haemoptysis | 11 | 18.3 |
| Loss of appetite | 60 | 100 |

Table-7 shows sympatomatology of cases of the study group. Cough, expectoration and loss of appetite was the outstanding manifestation and was seen in 100% cases. Fever was also present in most of the cases. It was present in 91.6% cases. Chest pain was present in 60% of cases and breathlessness was present in 61.6% cases. Haemoptysis was seen in 18.3% cases of the study group.

**Table 8: Showing investigation in the study group.**

| Blood cells count | | No. of cases | % |
|---|---|---|---|
| Haemoglobin | > 11.5 gm%<br>< 11.5 gm% | 0<br>60 | 0<br>100 |
| Total leucocyte count | < 45000/cumm<br>11000/cumm<br>> 11000/cumm | 0<br>42<br>18 | 0<br>70<br>30 |
| Polymorphs | > 60%<br>< 60% | 43<br>17 | 71.6<br>28.3 |
| Lymphocytes | > 40%<br>< 40% | 3<br>57 | 05<br>95 |

Table-8 shows the blood count of the study group. 100% cases having hemoglobin less than 11.5% gm%, whereas total leucocyte count was increased. Differential leucocyte count showed that 71.6% cases were having polymorpho nuclear leucocytosis whereas lymphocytosis was present in 0.5% cases.

**Table 9: Showing sputum for acid fast bacilli in the study group.**

| Sputum for AFB | No. of cases | % |
|---|---|---|
| Positive | 41 | 68.3 |
| Negative | 19 | 31.6 |
| Total | 60 | 100 |

Table 9 shows that acid fast bacilli in the sputum was positive in 68.3% cases.

**Table 10: Bacteriological finding**

| | No. of cases | % |
|---|---|---|
| Sputum culture & throat swab negative (Sterile) | 21 | 35 |
| Sputum culture and throat swab positive | 39 | 65 |
| Total | 60 | 100 |

Table-10 shows that out of 60 cases potential pathogens were preset in 65% of cases.

**Table 11: showing potential pathogens in 60 cases**

| Sputum for AFB | No. of cases | THROAT SWAB | | SPUTUM | |
|---|---|---|---|---|---|
| | | No | % | No | % |
| Sputum culture and throat swab positive | 39 | 29 | 48.3 | 39 | 65 |
| Sputum culture & throat swab negative (Sterile) | 21 | 00 | 00 | 00 | 00 |

Table-11 shows that our of 60 cases 29 (48.3%) yielded potential pathogens in their throat swab and 39 (65%) in sputum culture.

**Table 12 : Showing growth of various organism from throat swab**

| Organism | No. of cases | % |
|---|---|---|
| Staphylococcus aureus | 13 | 21.6 |
| Klebsiella | 6 | 10 |
| Pseudomonas | 6 | 10 |
| Pneumococcus | 2 | 3.3 |
| Proteus | 2 | 51.6 |
| Culture sterile | 31 | 51.6 |
| Total | 60 | 100 |

Table-12 shows growth of various pathogens in throat swabs from 60 cases of pulmonary tuberculosis. Staphylococcus aureus was seen in 21.6% cases and Klebsiella and pseudomonas was seen in 10% cases. Pneumococcus and proteus was seen in 3.3% cases.

**Table 13: Shows growth of various organism from sputum**

| Organism | No. of cases | % |
|---|---|---|
| Staphylococcus aureus | 19 | 31.6 |
| Klebsiella | 7 | 11.6 |
| Pseudomonas | 7 | 11.6 |
| Pneumococcus | 4 | 6.6 |
| Proteus | 2 | 3.3 |
| Culture sterile | 21 | 35 |
| Total | 60 | 100 |

Table-12 shows growth of various pathogens in throat sputum 60 cases of study group. Staphylococcus aureus was present in 31.6% cases and Klebsiella in pseudomonas was seen in 11.6% cases. Pneumococcuwas seen in 6.6% cases and proteus was seen in 3.3% cases.

**Table 14 : Showing the correlation of bacterial growth in throat swab and sputum specimens.**

| Organism | Specimens | |
|---|---|---|
| | Throat swab | Sputum |
| Staphylococcus aureus | 13 | 19 |
| Klebsiella | 6 | 7 |
| Pseudomonas | 6 | 7 |
| Pneumococcus | 2 | 4 |
| Proteus | 2 | 2 |
| Culture sterile | 31 | 21 |
| Total | 60 | 100 |

Table-14 depicts the correlation of bacterial growth in sputum and throat swab specimen it is apparent from the table that in throat swab specimen staphylococcus aureus was present in 13 cases while in sputum it was present in 19 cases. Klebsiella and pseudomonas were present in 6 specimens in throat swab whilte in sputum they were presen in 7 specimens, pneumococcus was present in 2 specimens of throat swab while it was present in 4 specimens in sputum. Proteus was present in 2 specimens of throat swab and sputum.

**Table 15: Showing correlation of pathogenesis in 39 cases.**

| Pathogenesis | No. of cases | % |
|---|---|---|
| Same pathogenesis in throat swab and sputurm | 29 | 74.3 |
| Pathogens in sputum only | 10 | 25.6 |
| **Total** | **39** | **100** |

Table-15 shows the correlation between pathogenesis isolated from throat swab and sputum in 39 cases. Same pathogens were present in throat swap and sputum in 29 cases while in 10 cases pathogens were recovered from sputum culture only.

**DISCUSSION:**

Tuberculosis, a worldwide malady has been posing a great threat, especially in developing countries. Foci of tuberculosis may remain dormant for long time and produce clinical disease many years later. In this study of 60 cases maximum number of cases were between the age group of 21 - 30 yrs both in male and females.

Second peak of cases was seen in the age group of 31 - 40 Yrs in this study. According to Rich (1951) The possible factor of tuberculosis in higher age group is lowering of the resistance in that age group as compared to the younger age groups.

In this study the pulmonary tuberculosis mainly affected lower socio- economic groups. Anderson *et al.,* (1954) also found the prevalence of disease significantly more in the lower socio-economic groups. Association of tuberculosis with poverty has been attracting attention since long. Poverty implies low standard of living, a certain amount of malnutrition specially protein deficient diet, overcrowding and unhygienic living conditions. A survey in a large group of civil servants in Delhi (Pamra *et al.,* 1968), showed prevalence and incidence of tuberculosis to be nearly three times more in low income group than in middle Income group. Some of the occupations are better paid and the consequent better economic status reduces the susceptibility to disease of those working in them as compared to other like unskilled labourers whose wages are poor and work very exhausting.

Above 16.6 % of cases were having positive .family history of pulmonary tuberculosis in this study. Similar instances of infectiousness has been reported, by Medler (1956). The question of inheritance of resistance or susceptibility to tuberculosis has not yet been precisely answered. Family history of tuberculosis is mainly concerned with a history of contact. Head & Rusby (1957) stated that source need not always be familial, more often it is extrafamilial and therefore difficult to locate.

In this study cough, expectoration and loss of appetite were the man features and were present in almost 100% cases. Fever was present in about 90% of cases. Chest pain and breathlessness was present in about 16 % of cases. Haemoptysis was seen in about 18 % of cases.

Appearance of symptoms early or late depends not only upon the extent and situation of the lesion but primarily upon the state of natural resistance, allergic hypersensitivity and the virulence of the infective organism. Moreover symptoms may persist even after the lesions is healed, as in residual bronchiectasis fibrosis, chronic bronchitis, and secondary infections. Lassitude is one of the earliest symptoms, in the beginning it is experienced only towards the end of the day and disappears after a short rest. Gradually the patients begin to feel tired earlier and more easily. Loss of weight slow but progressive is a sequent symptom.

As. a rule, every case of active pulmonary tuberculosis exhibits some degree of pyrexia which is one of the important clinical symptom. In the early phases the fever is low grade and of short duration usually occurring in late afternoon or evening. Of all symptoms of pulmonary tuberculosis cough is the most common and gets exaggerated when respiratory infection is co - existing. Haempotysis IS very important evidence of pulmonary tuberculosis.

In this study more than half of the patient were having duration of illness range from 0-12 months.

In present study acid fast bacilli in sputum were positive in 68.3% cases.

This present study is limited to the isolation in sputum and in throats swab of pyogenic organism only, no attempt was made to culture anaerobes and fungi. No special procedure to obtained uncontaminaed secretions from lower respiratory tract such as transtracheal aspiration or fibreoptic bronchoscopy was imployed.

Inspite of these limitations it was possible to established a fair degree of certainly of presence of non tuberculous pyogenic bacteria in case of pulmonary tuberculosis.

The finding of present study emphasize that sputum is still an adequate material to isolate pathogens In a large 'majority of patients with secondary organism.

Brunfit and Willoughby (1958) have suggested that it may to useful to culture throat swabs as well as sputum. In our study out of 39 culture positive sputum specimens 29 (74.3%) were having same pathogens in throat swab. 10 (25.6%) sputum specimen were having pathogens exclusively In sputum but not in throat swab.

In the present study the microorganism could be grown from 64.7% specimen of sputum. Nearly similar result has been shown by Agrawal *et al.,* (1983).

The present study shows predominantly Staphyllococcus Aureus (31.6%), Klebsiella 11.6%, Pseudomonas 11.6%, Pneumococcus 6.6%, and Proteus 3/3 %.

Previous study of Elmes *et al.*, (1953) showed pneumococcal and haemophilus influenzae as the commonest pathogens responsible for secondary infection in pulmonary tuberculosis.

They have further suggested that these pathogens play important role in development of chronic bronchitis ansmg as sequel to pulmonary tuberculosis.

It is generally believed that during sleep, when the larynx is off guard and in the course of upper respiratory tract infection, the material from the upper respiratory passage gravitates in the bronchial tree. When the bronchial tree is healthy it is usually able to rid itself of this infected material but if it extensively damaged as a result of pulmonary tuberculosis, potential pathogen from upper respiratory tract may well be able to secure a permanent foothod in the lower respiratory tract.

Reid (1958) considered that in chronic bronchitis as a sequel to pulmonary tuberculosis potential pathogens are mostly found in lower respiratory tract due to their constant trickling from upper respiratory tract. An increasing breathlessness and expectoration In chronic cases of pulmonary tuberculosis has previously been thought to be due to the constant presence of tubercle bacilli, but from present study it has become clear that presence of potential pathogens In such cases is the real cause of constant dyspnoea, and expectoration as the cough, expectoration and breathlessness are the main feature of pulmonary tuberculosis cases in this study.

A number of antitubercular drugs like streptomycin and rifampicin are active against variety of organism for example, streptomycin is effective against E. Coli and Klebsiella, similarly rifampicin is active against meningococus, staphylococus aureus, pneumococus and hemolyticus streptococci. It appears that resistance soon develop in these organisms against these antitubercular drugs in course of treatment.

In the management of pulmonary tuberculosis therefore it seems best to dispense with routine bacteriology as a guide to start therapy and to select an antibiotic effective against

important potential pathogens isolated from such cases before or during antitubercular chem

## CONCLUSION:

The present study was carried out with the aim to study of detection of pyogenic non - tuberculous bacteria in cases of pulmonary tuberculosis. The attempt was made to find out the bacterial flora of upper and lower respiratory tract in cases of pulmonary tuberculosis. For this purpose 60 patients of pulmonary tuberculosis were selected from the wards of T.B and Chest department Maharani Laxmi Bai Medical College, Jhansi.

All these cases were subjected to detailed assessment encompassing of through history taking, clinical examination, laboratory investigation including sputum examination for acid fast bacilli and X - ray Chest P. A. View. From each case throat swab & sputum were collected & subjected for gram's staining and culture. Final identification was done by their colony characteristics and standard bio - chemical tests. The findings of study are as follows :

- Total number of 60 cases included in present study.
- There were 51.6% males and 48.3 % females in present study.
- About half of male and female patients falls in the group of 21 - 30 years.
- In the present study cases of pulmonary tuberculosis were mainly from low socio-economic status.
- Family history of pulmonary tuberculosis was present In about 16 % cases and in most of the cases source of infection was extra familial.
- In present study cough, expectoration, fever, loss of appetide chest pain, breathlessness were the common presenting symptoms.
- In the present study the micro organism could be grown from 39 ( 65 % ) specimens of sputum.
- Study emphasized that sputum culture IS still an adequate material to isolate pathogens.
- The present study showed pre-dominantly staphylococus aureus in 31.6 % cases followed by Klebsiella !' and pseudomonas In 11.6 % cases pneumococus in 6.6 % cases and proteus was present in 3.3% cases.
- High yield of potential pathogens from cases of pulmonary tuberculosis suggested that these organism were responsible for the development of chronic bronchitis, extensive expectoration and increasing breathlessness
- It could be concluded that in the management of pulmonary tuberculosis one must dispense with routine bacteriology as a guide to therapy and to select suitable antibiotic against specific pathogens.

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