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A STUDY ON LEAP IN POST TUBERCULOSIS SEQUELAE CASES WITH IMPAIRED SPIROMETRIC EVALUATIONS

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ABSTRACT

Multi-drug resistant tuberculosis (MDR-TB) is a predominantly difficult form of TB categorized by confrontation to first line drugs like Rifampicin and Isoniazid without or with confrontation to any other anti-tuberculosis drugs. Resistance to Rifampicin and Isoniazid, two frontline drugs that form the backbone of the short-course treatment, would necessitate using drugs that are more toxic, costly and are administered for a long period the MDR-TB patients that fail treatment have a higher risk of death. Drug resistance is entirely man-made and instigated by inconsistent or incorrect treatment. Its emergence and increase is a growing problem. Drug resistance development is a considerable risk if patients are not properly tested and treated. This study was done in the Department of Pulmonology treated pulmonary tuberculosis patients. The diagnosis of post tubercular sequelae was based on the past history of treated pulmonary tuberculosis patients along with clinico – radiological examination, negative sputum inspection for acid fast bacilli, and spirometry. Patients were made to sit and spirometry was done using NDD easy on PC spirometer according to the ATS guidelines.

Key words: COPD, MDR-TB, TB, WHO, HIV, Rifampicin and Isoniazid.

INTRODUCTION

In this section represents introduction of this research work. Multi-drug resilient tuberculosis (MDR-TB) is a predominantly difficult form of TB categorized by confrontation to first line drugs like Rifampicin and Isoniazid without or with confrontation to any other anti-tuberculosis drugs.[1] Resistance to Rifampicin and Isoniazid, two frontline drugs that form the backbone of the short-course treatment, would necessitate using drugs that are more toxic, costly and are administered for a long period the MDR-TB patients that fail treatment have a higher risk of death.[2] Drug confrontation is completely man-made and instigated by unreliable or incorrect treatment. Its emergence and increase is a growing problem. Drug resistance development is a considerable risk if patients are not properly tested and treated. HIV infected people are at risk of developing active TB 20 to 40 times more than non-infected people.[3] In 1991, the World Health Assembly (WHA) determination recognized TB as a worldwide public health problem and advised two goals for countrywide tuberculosis programs, for detecting 70 percent of recent smear-Positive patients and curing 85% of such cases by using the year 2000 in an try to rejuvenate international TB manipulate.[4] Thereafter, in 1993, the World Health Organisation (WHO) identified the deadly effect of this disease and declared it a “Global

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Emergency". The DOTS approach was launched in 1994, and the Globally advocated approach for TB manipulate due to the fact then. Majority of the patients who have completed pulmonary TB treatment though having been declared microbiologically cured still continue to have symptoms as a consequence of sequele of the treatment [5]. Histopathological Findings due to tuberculosis encompass the construction of cavity formation, caseating granuloma, and tissue liquefaction. When these happen in the lung, many stayers involvement enduring anatomic modifications like parenchymal and bronchial structural changes, inclusive of bronchial stenosis, broncho-vascular distortion, bronchiectasis, emphysematous adjustments, residual cavities and fibrosis all of which has the ability to cause severe lung function abnormalities.[6] Lannee has described the association between tuberculosis and airway involvement more than hundred years back[5]. This parenchymal destruction is said to be because of upregulation of proteases and protease control dysregulation.[7] This post tubercular abnormality has emerged as a separate clinical entity.

In this articlerepresents sector 2 of this articlesilluminates the detail on the related works. In section 3 presents the materials and methods adopted and section 4 presents the particulars of the experimentations and discussions. Finally segment 5 accomplishes the articles by allocation our implications and upcoming strategies.

RELATED WORKS

In this segment presents focuses the related works of this research work. Studies have shown that associated risk factors such as smoking, household cooking fuel exposure, subjects having occupation that exposes them to dusts and gases, poor socio economic status, treatment failure or relapse and poor nutritional status play a significant role in the development of post tubercular sequel.[8] There are many causes for airway diseases. Among which treated pulmonary tuberculosis patients presenting with airway obstruction is very well established.[9] Studies have estimated that around 48.7% to 76% of the patients who have been preserved for pulmonary tuberculosis can represent with airway diseases and several studies now being extensively done to prove the association between tuberculosis and airway diseases. Pulmonary tuberculosis can result in the scarring and fibrosis of the airways, which causes symptoms like difficulty in breathing, wheeze, chest pain, cough and dyspnea on excertion.[10] Many previous studies have shown that these treated pulmonary tuberculosis develop only obstructive defects. However studies that are done recently have shown other pulmonary impairments like mixed or restrictive pattern can also be seen.[11] Patients with these post tubercular airway diseases have impaired quality of life with long-term respiratory complaints and they must be subjected to accurate pulmonary function test to quantify the extent of their impairment. Tuberculosis as a cause of chronic obstructive pulmonary diseases was inducted in GOLD guidelines in 2006. Since then the part pulmonary tuberculosis in the growth of chronic obstructive pulmonary disease has been restudied and has been estimated that COPD prevalence has gone up by 3.7 to 5%.This study was undertaken to see the clinico – radiological profile along with the spirometry impairment in treated PTB patients along with an aim to assess risk factors like compliance, default rate, treatment history like number of times ATT has been taken, smoking and occupation that contribute to significant morbidity in the treated PTB patients based on their clinical, radiological and spirometry parameters.[12]

MATERIALS AND METHODS

In this segment represents the methods and materials of this research work. This study was done in the Department of pulmonology treated pulmonary tuberculosis patients. The diagnosis of post tubercular sequele was based on the past antiquity of treated pulmonary tuberculosis patients along with clinico – radiological examination, negative sputum inspection for acid fast bacilli, and spirometry. This study conducted in the period of September 2019 – February 2020. 104 subjects were analyzed the prospective Observational study.

Inclusion Criteria

- Age: 18 - 60 years
- Patients who were previously diagnosed with pulmonary tuberculosis
- Patients with no evidence of active pulmonary tuberculosis bacteriologically, radiologically and clinically.

Exclusion Criteria:

- Age less than 18 and more than 60
- Active haemoptysis
- Pts who are Pregnant
- Active Tuberculosis and patients on ATT, MDR TB, XDR TB
- Significant renal and cardiac problems.
- Patients with the history of any pulmonary diseases like BA, COPD, ILD before occurrence of pulmonary tuberculosis
- Patients with respiratory failure
- Immunocompromised states like diabetes and HIV

Patients fulfilling above criteria were encompassed in the study. After procurement patients were educated about the study. All the patients in the study were investigated as follows:

A detailed clinical history including treatment history of Tuberculosis was elicited. Based on the regularity of ATT, patients were categorized as having

good compliance if they have taken more than 95% or more of their ATT drugs during their treatment, otherwise regarded as having poor compliance13.

After being evaluated as per the Proforma. Patients were reviewed at the end of 3rd month and 6th month. They were assessed clinically with a scoring system at the end of 3rd and 6th month and objectively (Spirometry) at the end of the 6th month. The obtained data was scrutinized by relating suitable statistical experiments.

Statistical analysis was done for all 104 patients. Information regarding age, gender, chest x-ray findings, spirometry, smoking habits, number of times ATT was taken, compliance to TB treatment and occupation were noted. The results were plotted in Microsoft Office Excel worksheet and were analyzed. Statistics were done using percentage analysis, cross tabulation analysis and chi square test. Statistics was achieved using Statistical Package for Social Sciences (SPSS) version 13.0 for Windows.

RESULTS AND DISCUSSIONS

In this segment focuses the results and discussions of this research work. The study was showed at Department of Pulmonology. The data obtained from 104 subjects were analyzed and aggregate data of the study is shown.

Table 1: Correlation between Chest X Ray Pattern and Spirometry – I Visit Day '0'

Chest x ray type	Obstructive	Restrictive	Mixed	Normal
Mild	**44**	**2**	**1**	**0**
Moderate	**20**	**7**	**3**	**0**
Advanced	**7**	**13**	**7**	**0**

Table 2: Chi – Square Test

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	36.434[a]	4	.000
Likelihood Ratio	38.631	4	.000
Linear-by-Linear Association	30.670	1	.000
No. Of Valid Cases	104		

From the above table Asymp. Value is 0.000, which is less than 0.01

Table 3: Correlation between Chest X Ray Pattern and Spirometry – III Visit Day '180'

Chest x ray	Obstructive	Restrictive	Mixed	Normal
Mild	**16**	**2**	**1**	**28**
Moderate	**20**	**7**	**3**	**0**
Advanced	**6**	**14**	**7**	**0**

Table 4: Chi Square Test

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	63.667[a]	6	.000
Likelihood Ratio	71.241	6	.000
Linear-by-Linear Association	9.755	1	.002
No. Of Valid Cases	104		

From the above table Asymp. Value is 0.000, which is less than 0.01.

In India, Mostly due to better prices of treatment noncompliance, the number of disasters inflicting multi-resistance to pills is approximately 12% of treatment results triggering prime public fitness trouble. There are alterations inside the complaint of maximum TB sequelae. Some authors concluded that TB causes obstructive pattern while others concluded that both restrictive and mixed can also be seen.

Menon et al. described that despite adequate ATT and early clinical response in newly diagnosed pulmonary tuberculosis patients, large percentage of these patients have residual radiological changes which can cause severe pulmonary impairment. They also stated that in subjects with severe inflammatory response, because of severe response to foreign organism there is more self tissue destruction.

Several studies have stated that in cases with initial sputum positivity there are more residual lesion than those with initial sputum negativity probably because of very high bacterial load which can cause significant residual lesions.

Al-Hajjaj et al stated that compliance to ATT also plays a huge role in residual lesions. Patients with good ATT compliance had very less lesions compared to those who had poor compliance to ATT therapy. This study also stated that in subjects with severe radiological lesions

during their initial diagnosis, extending their treatment time might reduce post treatment sequelae. Similarly in our study we noticed that, in subjects with poor compliance to ATT treatment had more radiological lesions compared to patients with good compliance.

Many studies have stated that there is an association between smoking, biomass fuel exposure and occupational lung toxins and patients developing post tubercular pulmonary impairment. Similarly in our study we observed that more than 61% of the patients were smokers and 59% of them had occupation, which exposes them to harmful dusts and smokes.

Pasipanodya et al done in health science Centre, University of North Texas states that maximum of the patients with preserved pulmonary tuberculosis presented a preventive design on spirometry. However in our study the majority of the patients had obstructive pattern. Pulmonary impairment was further communal in cigarette smokers. They concluded that pulmonary impairment contributes significant, beforehand unmeasured cargoes of tuberculosis in microbiologically cured patients that may comprise chronic damage and additional humanity and microbiological cure is the commencement, not the end, of their infection.

In our study, there was a male predominance than female with a ratio of 2.1: 1 and maximum patients were among 51 to 60 years age group and all the patients were symptomatic counting cough, sputum and breathlessness due to pulmonary tuberculosis sequelae and presented decrease in pulmonary function. We also originate correlation between defaulters, patients with poor compliance to ATT, occupational exposures and extensive lung involvement radiologically.

Hayett et al stated that in patients with extensive tuberculosis lesions causes restrictive type of pulmonary impairment. However in our study we observed that even in subjects with minimal radiological changes can have restrictive pattern. Breathing damage arises from numerous anatomical capabilities. Injury to bronchi as a result of large fibrosis or endobronchial stricture can reason airflow obstruction. Superior lung extent loss seems to stalk from parenchymal harm and succeeding fibrotic system. Our observation established the lifestyles of extensive purposeful boundaries in sufferers with sequelae of pulmonary tuberculosis.

CONCLUSION

Finally this work concludes that the prevailing look demonstrates a giant growth in the functional challenge in patients with pulmonary tuberculosis sequelae. Deviations in lung characteristics and big residual lesions aren't communal answers in patients with tuberculosis who're recognized early and whose treatment is suitable and uneventful. Delays within the documentation of cases of pulmonary TB are because of insufficient valuation of symptomatic respiratory distress or delay in looking for clinical consideration. Smoking and occupational publicity records become a substantial predictor of pulmonary characteristic deterioration. In patients with extensive residual lesion we observed a significant correlation with pulmonary function impairment. Patients who had very poor compliance to ATT and who were defaulters had severe residual lesions causing severe pulmonary impairment.

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