

# ORIGINAL ARTICLE

## Effect of Smoking in Development of Pulmonary Tuberculosis

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### ABSTRACT:

**Background:** Tuberculosis is a bacterial disease caused by mycobacterium tuberculosis, a gram positive bacteria. It is the leading cause of death worldwide affects one third of current global population. Tuberculosis is a bacterial disease caused by mycobacterium tuberculosis, a gram positive bacteria. It is the leading cause of death worldwide affects one third of current global population. **Materials & Methods:** This study was conducted in the department of Pulmonary Medicine in year 2014. It included 60 patients found sputum smear positive, diagnosed clinically and radiologically positive for mycobacterium tuberculosis. Patients were divided into 2 groups. Group I consisted of controls (60) and group II consisted of TB positive patients. A detailed history was taken from each individually particularly pertaining to respiratory system like fever, cough, expectoration, chest pain, hemoptysis, breathlessness weight loss, appetite loss, leg swelling etc. **Results:** Both group I and II comprised of 60 patients each. The difference was non-significant (P<0.05). In group I, 40 and in group II, 28 were non smokers. In group I, 7 were mild, 5 were moderate and 8 were moderate smokers. In group II, 12 were mild, 8 were moderate and 12 were heavy smokers. The difference was significant (P<0.05). Common radiological findings were emphysema in group I (5) and group II (7), hilar opacities in group I (3) and group II (5), infiltrations in group I (2) and group II (3), fibrocavitary in group I (1) and group II (4) and cavity alone in group II (4), lung collapse in group I (2) and group II (3), military opacities in group I (1) and group II (2), bronchopneumonia in group I (3) and group II (2), pleural effusion in group I (1) and group II (1) and consolidation in group I (1) and group II (1). AFB 1 +ve were seen in 4 patients, 2 +ve was seen in 6 patients and 3 +ve in 22 patients. The difference was significant (P<0.05). **Conclusion:** The incidence of pulmonary tuberculosis increases with the duration of smoking. Smoking is an important risk factor for development of pulmonary tuberculosis.

**Key words:** Emphysema, Smoking, Tuberculosis.

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### INTRODUCTION

Tuberculosis is a bacterial disease caused by mycobacterium tuberculosis, a gram positive bacteria. It is the leading cause of death worldwide affects one third of current global population. It affects 1.8 million people every year. Annual risk of becoming infected with Tuberculosis is 1.5 percent and once infected there is 10% lifetime risk of developing Tuberculosis.<sup>1</sup>

The most common cause of tuberculosis is smoking. The total of smokers in the world has increased dramatically. Now, approximately there are 3 billion of smokers and it will increase to 1.7 billion smokers in 2025. Around 65-85% of tobacco has been consumed all over the world form cigarettes and it has led to mortality every second. Smoking

affects the lung excessively. The relation in both was well established in 20th century.<sup>2</sup>

World Health Organization (WHO) shows that Indonesia becomes the 3rd biggest country of smoker rate after China and India, followed by Russia and United States. Smoking is done by cigarettes in urban area and bidis in rural area. Cigarette smoke contains more than 4,500 chemicals that have various kinds of toxic, mutagenic and carcinogenic effect. The contents and concentrations of the chemicals are various in different brands of cigarettes. Cigarette smoke produces various components of cellular and extracellular compartment ranging from water-soluble particles and gases.<sup>3</sup>

The substances that have adverse effects are nicotine, ammonia, carbonmonoxide, carbondioxide, formaldehyde, acrolein, acetone, benzopyrenes, hydroquinone, nitrogen oxide and cadmium. Many substances that are carcinogenic and toxic to the cell, but tar and nicotine have been shown immunosuppressive by affecting the innate immune response of the host and increase susceptibility to infection. Pharmacologic ingredient in tobacco causing addiction is nicotine. It is solid and easily absorbed by the mucous membranes of the nose, mouth and lung tissue.<sup>4</sup> The present study was conducted to establish the effect on smoking in the development of pulmonary tuberculosis.

**MATERIALS & METHODS**

This study was conducted in the department of Pulmonary Medicine in year 2014. It included 60 patients found sputum smear positive, diagnosed clinically and radiologically positive for mycobacterium tuberculosis. Patients were divided into 2 groups. Group I consisted of controls (60) and group II consisted of TB positive patients. All were informed regarding the study and written consent was obtained. A detailed history was taken from each individually particularly pertaining to respiratory system like fever, cough, expectoration, chest pain, hemoptysis, breathlessness weight loss, appetite loss, leg swelling etc. Past medical history of any chronic lung disease, pneumonia, tuberculosis, bronchial asthma, heart disease,

hypertension, diabetes, renal disease, HIV was obtained. Past history of pulmonary tuberculosis and antitubercular treatment was taken. Family and history of exposure to pulmonary tuberculosis was taken. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

**RESULTS**

Table I shows that both group I and II comprised of 60 patients each. The difference was non- significant (P=1). Table II shows that in group I, 40 and in group II, 28 were non smokers. In group I, 7 were mild, 5 were moderate and 8 were moderate smokers. In group II, 12 were mild, 8 were moderate and 12 were heavy smokers. The difference was significant (P< 0.05). Graph I shows that common radiological findings were emphysema in group I (5) and group II (7), hilar opacities in group I (3) and group II (5), infiltrations in group I (2) and group II (3), fibrocavitary in group I (1) and group II (4) and cavity alone in group II (4). Graph II shows common radiological findings were lung collapse in group I (2) and group II (3), military opacities in group I (1) and group II (2), bronchopneumonia in group I (3) and group II (2), pleural effusion in group I (1) and group II (1) and consolidation in group I (1) and group II (1). Graph III shows that AFB 1 +ve were seen in 4 patients, 2 +ve was seen in 6 patients and 3 +ve in 22 patients. The difference was significant (P<0.05).

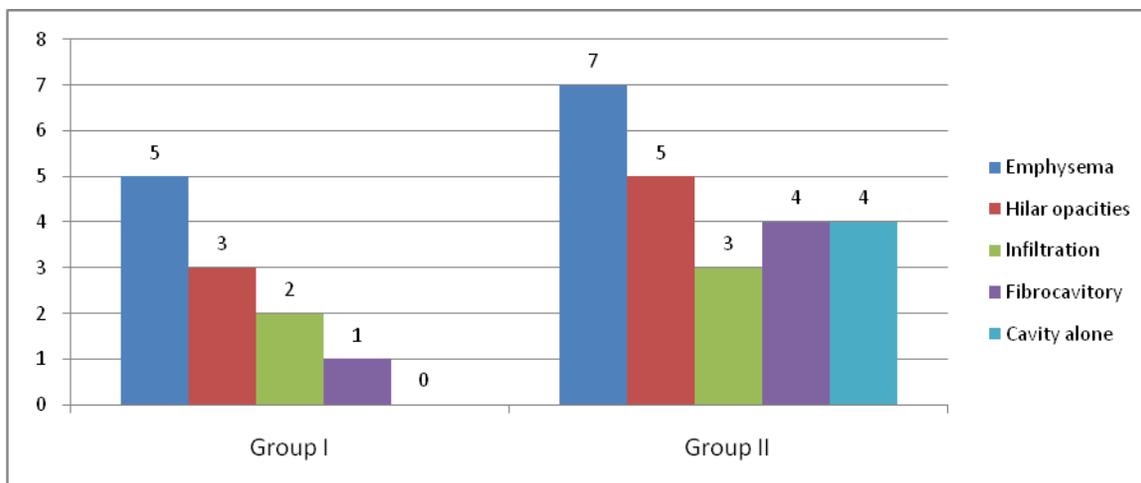
**Table I** Distribution of patients

Total- 120		
Group I (control)	Group II (TB positive)	P value
60	60	1

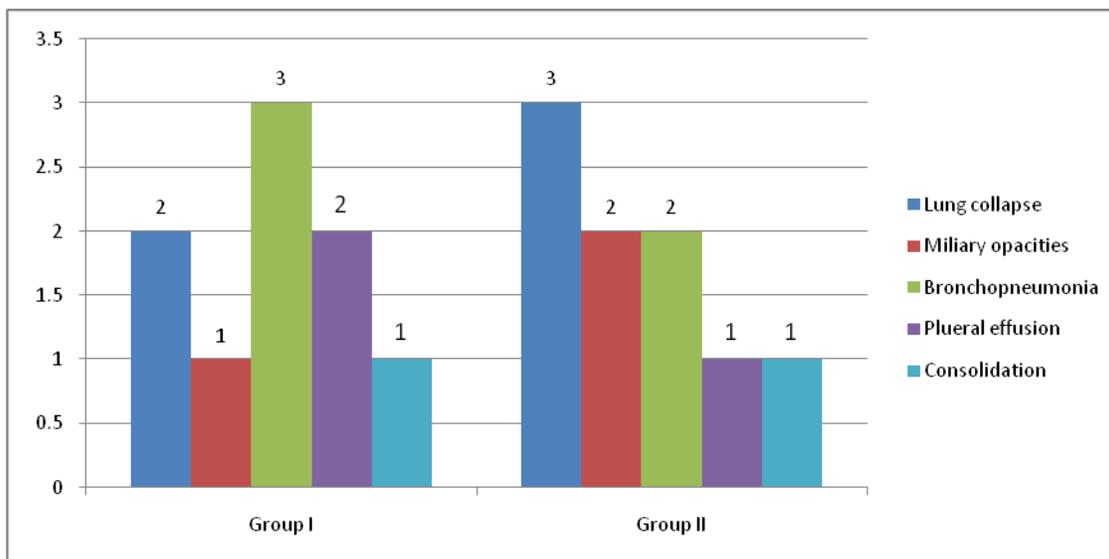
**Table II** Distribution of patients based on grade of smoking

Group	Mild (1-10)	Moderate (11-20)	Heavy (>20)	Non smokers
Group I (60)	7	5	8	40
Group II (60)	12	8	12	28
Total	19	13	20	68

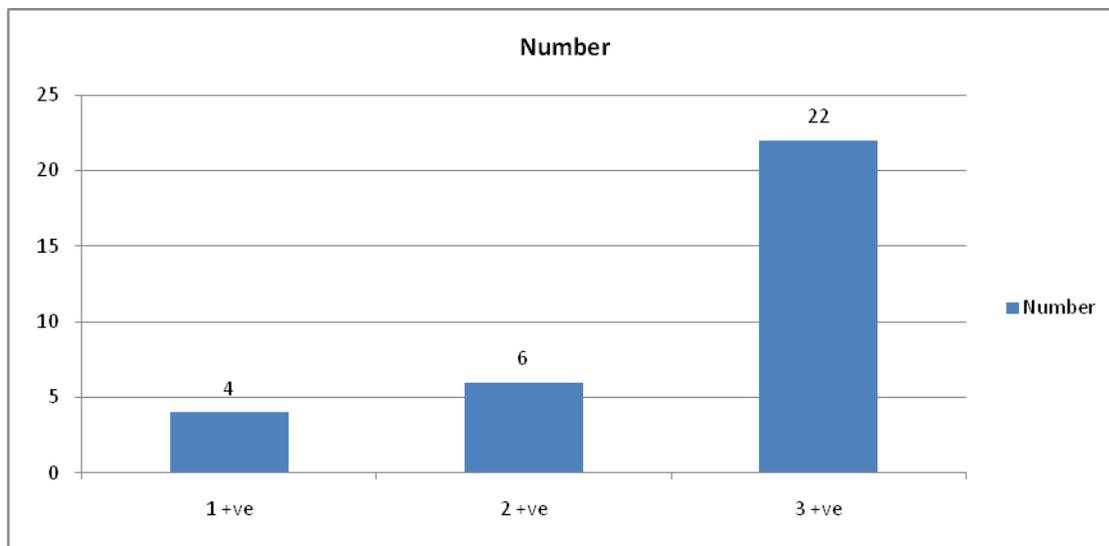
**Graph I** Radiological findings in patients



**Graph II** Radiological findings in patients



**Graph III** AFB positivity in group II patients



**DISCUSSION**

Tobacco has been cited as the cause of death globally for killing more than 5 million people worldwide each year. Smoking is an important risk factor for cardiovascular disease as well as 5 other major causes of death worldwide, namely cerebrovascular, lowers respiratory tract infection, COPD, tuberculosis, and respiratory cancers. Smoking remains the major cause of preventable death in the world.<sup>5</sup> The present study was conducted to establish the effect on smoking in the development of pulmonary tuberculosis. In present study, we divided patients into 2 groups. Both groups comprised of 60 patients each. Group I was control group while group II was AFB positive group. In group I, 40 and in group II, 28 were non smokers. This is similar to results of Buskin et al.<sup>6</sup> We found that in group I, 7 were

mild, 5 were moderate and 8 were moderate smokers. In group II, 12 were mild, 8 were moderate and 12 were heavy smokers. This is in agreement with Fernandez et al.<sup>7</sup> Common radiological findings were emphysema, hilar opacities, infiltrations, fibrocavitary, cavity alone, lung collapse, military opacities, bronchopneumonia, pleural effusion and consolidation. This is in agreement with Murin et al.<sup>8</sup> We found that AFB 1 +ve were seen in 4 patients, 2 +ve was seen in 6 patients and 3 +ve in 22 patients. This is similar to Kollappam et al.<sup>9</sup> In 1992, WHO declared TB as a global emergency. Currently, tuberculosis mainly attacks productive age people and increases mortality, especially in developing countries. In 2010, it was reported the

incidences of tuberculosis in the world were at 8.8 million, 1.1 million deaths due to HIV-negative TB plus 0.35 million TB sufferers with HIV-positive.

TB diagnosis can be established based on clinical symptoms, physical examination, bacteriological examination that have important meaning in establishing the diagnosis. Material for this bacteriological examination can be derived from the phlegm, pleural fluid, cerebrospinal fluid, bronchial washings, gastric washings, broncho alveolar lavage/ BAL, urine, faces and biopsy tissue (including fine needle biopsy/ BJH). Radiological examination with standard examination of chest X-ray of PA (posteroanterior) and other radiology examinations are lateral photos, top-lordotic, oblique or CT-Scan.<sup>10</sup>

### CONCLUSION

The incidence of pulmonary tuberculosis increases with the duration of smoking. Smoking is an important risk factor for development of pulmonary tuberculosis.

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