Original Article: Study of Effect of Smoking on Pulmonary Tuberculosis Patients

Manjula Gupta (MD)[1], Kiran Tandia(MD)[2]

[1]*Proffessor in Department of Medicine Bundelkhand Medical College sagar*
[2]*Senior resident in Department of Medicine Bundelkhand Medical College sagar*

Abstract:
Introduction: *Tuberculosis remains a world wide public health problem. Smoking is a major health hazard, it is less thought of as a contribution to morbidity and mortality of tuberculosis. This prompted us to carry out case-control study to determine association between tobacco smoking and pulmonary tuberculosis in case and controls selected from a nested population surveyed for pulmonary tuberculosis.*
Aims And Objectives: *To find out the pattern and degree of smoking in normal healthy control group. To find out the smoking habit and its pattern in cases of pulmonary tuberculosis patients and the effect of smoking on course and severity of illness. To find any correlation between smoking habit, duration with type and clinical course of pulmonary tuberculosis and its complications.*
Material And Methods: *It was a case control study that comprised of 200 subjects ie.100 cases and 100 control. Men aged 20-50 years who were screened clinico radiologically and microbiologically, declared not to have tuberculosis formed the control group. Cases were defined as men aged 20-50 year who were sputum positive for mycobacterium tuberculosis or in the absence of bacteriological confirmation, disease diagnosed on clinical, radiological grounds together with an appropriate response to antituberculosis treatment.*
Results*: There is a strong correlation between duration of smoking and occurrence of pulmonary tuberculosis which is statistically significant ie.(p<0.001). The odd ratio for mild , moderate and heavy smokers were 1.56,1.99and 3.32 respectively. This shows strong dose relationship between number of cigarette/beedi and occurrence of pulmonary tuberculosis which is statistically significant ie. (p<0.001).*
Conclusion: *Although an association between smoking and tuberculosis appears evident, prospective studies would help to confirm the available data and to highlight this noxious association. Nevertheless smoking should be considered as an important risk factor for development of pulmonary tuberculosis and its complications. So all the effects must be made to check the initiation of smoking in teenagers so as to avoid nicotine addiction and prevent the morbidity and mortality caused by this self   inflicted source of humanity.*
Acknowledgment: *We sincerely thanks to all members of department of medicine of Bundelkhand Medical College Sagar.*
Keywords: *Pulmonary tuberculosis, smoking, clinical study, pathological study, radiological study, case control study, health hazard.*

I. Introduction

Tuberculosis remains a worldwide public health problem. It is estimated that about one third of current global population is infected asymptomatically with tuberculosis, of which 5-10% will develop clinical disease during their lifetime. Every year approximately 1.8 million persons develop tuberculosis, of which about 0.8 million are new smear positive highly infectious cases. Annual risk of becoming infected with Tuberculosis is 1.5 percent and once infected there is 10% lifetime risk of developing Tuberculosis. Tuberculosis is a social disease with medical aspects. Smoking has been widespread for many decades among men in India. In rural areas most smoking involves beedis not cigarettes which are smaller and consist of 0.2- 0.3 g tobacco rolled in a leaf of a plant called Tomburni.

Smoking is a major health hazard , it is less thought of as a contribution to morbidity and mortality of Tuberculosis. This prompted us to carry out case control study to determine association between tobacco smoking and pulmonary tuberculosis in case and controls selected from a nested population surveyed for pulmonary tuberculosis.

II. Material And Methods

It was a case control study. The study was undertaken in the Department of Medicine, Bundelkhand Medical College and associated hospital.

Men aged 20-50 years who were screened clinico radiologically and microbiologically declared not to have tuberculosis formed the control group. Cases were defined as men aged 20- 50 year who were sputum

smear positive for mycobacterium tuberculosis or in the absence of bacteriological confirmation, disease diagnosed on clinical , radiological grounds together with an appropriate response to antituberculosis treatment.

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. All were questioned about the past history of any chronic lung disease, pneumonia, tuberculosis, bronchial asthma , heart disease, hypertension, diabetes, renal disease, HIV. Past history of pulmonary tuberculosis and antitubercular treatment was taken. Family and history of exposure to pulmonary tuberculosis was taken.

III. Results
The odds ratio for mild, moderate and heavy smokers was 1.56, 1.99 and 3.32 respectively. This shows strong dose relationship between number of cigarette / beedi and occurrence of pulmonary tuberculosis which is statistically significant i.e.($p<0.001$).

More positivity of sputum for AFB (3+) in group 2 A (45.2%) i.e. smoker cases. This mean smoking increases positivity of sputum for AFB. It indicates the higher radiological findings of fibrocavitatory lesions (12.9%), bronchopneumonia (8.06%) in smokers cases in comparison to non smoker.

IV. Discussions
Comparative study of effect of smoking on occurrence of tuberculosis among cases and controls. In the present study two groups were studied. Group1 was comprised of healthy adults controls which were subdivided into 2 subgroups depending their smoking habits i.e. group 1 A was comprised of non smoker controls. Group2 was comprised of cases of pulmonary tuberculosis patients which were also subdivided into subgroups depending their smoking habits i.e. group2 A comprised of smoker tuberculosis cases and group 2 B comprised of non smoker tuberculosis cases.

In group 1 A 10 (21.7%) were between 20 to 30 years of age , 15(32.6%) were between 31 to 40 years of age , 21(45.6%) were between 41 to 50 years of age . In group 2 A 15 (24.9%) cases were between 20- 30 years of age , 23(37.1%) were between 31 to 40 years of age , 26(41.94%) were between 41 to 50 years of age . Age adjusted odds ratio was 2.24 (95%confidence interval 1.27 to 3.94, $p<0.05$)using Mantel Hanzel estimate . This ratio is in accordance with **Kolappan et al (2002)**[1] study who found odds ratio 2.38 in his study.

The strong cumulative effect of smoking on the occurrence of pulmonary tuberculosis as evidence by the highly significant test for the trend i.e., $p<0.001$ i.e, smoking increases the incidence and prevalence rate of pulmonary tuberculosis.this results in accordance with **Kolappan et al (2002)**[1] study findings of odds ratio 1.72, 2.45,3.23 in three categories respectively. **Alcaide et al (1996)** [2]using a case control design and multiple logistic regression model for analysis for variables of interest, reported an odds ratio of 3.8 (95% cl 1.5 to 9.8) for active smokers. **Buskin et al(1994)** [3]in his case control study also concluded that risk of tuberculosis was 30%-50% higher among current and former cigarette smokers than never smokers. Persons smoking for >20 years had 2-3 times higher risk than never smokers.

The odds ratio (2.48) and the age adjusted odds ratio (2.24) obtained in this study are statistically significant($p<0.05$) This finding also matches with **Yu et al(1988) study.**[4]

On observed radiological findings among group1A control emphysema (28.57%) was the most common findings followed by hilar opacities (10.86%) and infiltrative lesions present in 2(4.34%)controls. This findings are in accordance with observation reported by **Edwards et al(1957)**[5]**, Gori et al**[7]**,Fernandez et al (1995)**[6]**, Ariyothai et al(2004).**[6]

These findings are in accordance with **Atlet et al (2005)**[6] observations who studied clinical and epedimiological aspects of smoking and tuberculosis in 13038 cases and concluded 5 times more severity of symptoms in smoker tuberculosis patients **Gupta et al.** [8]

These findings suggestive of increased incidence of emphysema , fibrocavitatory lesions in smoker TB cases compared to non smoker cases. These observations are in accordance with findings reported **by Mihaltan et al(1995), Murin et al (2000) Buskin et al (1994).**[9]

V. Conclusion
It was a case control study that was carried out in the deparment of medicine Bundelkhand Medical college Sagar and associated hospital to study the effect of smoking in pulmonary tuberculosis.Among 200 subjects studied , 108(54%) were smokers among which 91.6% were beedi smokers and 8.3% were cigarette smokers. Most of Tuberculosis cases studied (43.54%) had duration of smoking >20 years. This shows that incidence of pulmonary tuberculosis increases with the duration of smoking (OR-2.39) i.e. strong positive association ($p<0.001$). An association between smoking and tuberculosis appears evident, smoking should be considered as an imporatant risk factor for development of pulmonary tuberculosis and its complications . so all effects must be made to check the initiation of smoking in teenagers so as to avoid nicotine addiction and prevent the morbidity and mortality caused by this self inflicted source of humanity.

References

[1]. Kolappan C Gopi P G Tobacco smoking and pulmonary tuberculosis. Thorax 2002; 57: 964-966
[2]. Alcaide J. Altet M N, Plans P. et al. Cigarette smoking as a risk factor for tuberculosis in young adults: A case control study Tubercular lung disease.1996; 77: 112-116.
[3]. Ariyothai n, Podhipak A Akaraseuri P, Tornee s Smithtikam s, et al. Cigarette smoking and its realtion to pulmonary tuberculosis in adults. Southeast Asian J. Trop Med Public Health (2004);35:219-227.
[4]. World Health Organization Global Burden of disease unit. Global Health Statistics WHO, GENEVA,2006.
[5]. Buskin S E, GALE J L, Weiss N S, Nolan C M – Tuberculosis risk factors in adults in King Country, washington, 1988 through 1990. AM j Pub Health 1994 ; 84 ; 1750- 1756.
[6]. Fernandez Jorge M A, Alonso Mallo E, loboto Delgado L A, Martinez Sanchez J M. Extra – Pulmonary Tuberculosis P: retrospective study of 107 cases . Anales de Medicina Interna 1995;212-215.
[7]. Gori, G B: Appraoches to the reduction of total particulate matter in cigarette smoke. Proceedings of the Third World conference on smoking and health Vol1 Washington DC, Govt. Printing office, P 451 : 1976.
[8]. Murin S, Biello K.S. Matthay R. other smoking affected pulmonary disease .Clin Chest med 2000;121-137.

Table: 1 Table Showing Distribution Of Subjects With Different Grades Of Smoking

Group	Grading of smoking						Non Smokers
	Mild (1-10/day)		Moderate (11-20/day)		Heavy (>20/day)		
	No.of subjects	%	No.of subjects	%	No.of subjects	%	
Group I (A) (n=46)	22	47.8	15	32.6	9	19.59	54
Group II (A) (n=62)	24	38.7	21	3.87	17	27.42	38
Odds Ratio	1.59		1.99		3.32		

Table: 2 Table Showing Radiological Findings In Groups I Controls (N=100)

S.No.	Radiological Findings	Group1A		Group1B	
		No.of subjects (n=46)	%	No. of Subjects(n=54))	%
1.	Emphysema	12	28.57	00	00
2.	Hilar opacitiess	05	10.86	00	00
3.	infiltration	02	4.34	00	00

Table: 3 Table Showing Sputum Positivity For Afb Is Relation To Smoking In Group-Ii Cases (N=100)

Positivity of sputum for AFB	Group2 A		Group2 B	
	No. of subjects (n=62)	%	No. of subjects(n=38)	%
1+	12	19.3	14	36.8
2+	22	35.48	12	28.94
3+	28	45.2	13	34.21

Table: 4 Showing Radiological Finding In Group -2 Cases(N=100)

S.No.	Radiological findings	Group2A		Group2B	
		No. of subjects(n=62))	%	No.of subjects(n=38)	%
1.	infiltration	10	16.12	14	36.84
2.	fibrocavitatory	18	29.03	10	26.31
3.	Cavity alone	16	25.80	08	21.05
4.	Collapse destroyed lung	08	12.9	06	15.78
5.	Hilar opacities	16	29.03	11	28.9
.6	Miliary opacities	03	4.83	02	5.26
.7	Bronchopneumonia	05	8.06	02	5.26
8.	consolidation	04	6.45	02	5.26
9.	Pleural effussion	01	1.61	00	0