A study of the epidemiological pattern of pulmonary tuberculosis patients undergoing treatment at tuberculosis units of Lucknow

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ABSTRACT :

Introduction: Tuberculosis(TB) has always remained a public health challenge despite the availability of effective anti-TB drug therapy under Revised National Tuberculosis Control Programme(RNTCP) in India, for it still causes serious physical, mental suffering and high economic loss by affecting the productive sections of the population.
Objectives: The study identifies the epidemiological pattern of Pulmonary Tuberculosis in patients undergoing treatment at Tuberculosis Units (TUs) of Lucknow.
Material and methods: The cross sectional study was undertaken to study 400 pulmonary tuberculosis patients by employing a multi-stage sampling technique. Two rural TUs and two urban TUs were studied using Questionnaire method.
Results: The study concluded the New cases being the highest category both in rural and urban areas accounting for 71% and 74.5% of all cases respectively. Proportion of Defaulters was more in urban area whereas Relapses was more in rural area. No association was noted with the types of patients with regard to their place of residence ($p>0.05$). 74.5% patients were sputum positive for acid-fast bacilli and the sputum positivity had a significant statistical association with age group of patients ($p<0.04$). In all age groups the presenting complaints were cough, fever and expectoration that followed the same descending order. About 77.6% patients had had duration of cough for >5 weeks and 75.7% of patients with expectoration had it for > 5 weeks when medical care was sought. An effort could not find out any statistical association between sputum-smear status and history of smoking or expectoration or haemoptysis.
Conclusion: Pulmonary tuberculosis in Lucknow district has showed the usual epidemiological pattern of presentation and sputum positivity had a significant association with age group of the patients.
Keywords: Pulmonary Tuberculosis, Tuberculosis Unit (TU), DOTS centre, Epidemiological pattern.

INTRODUCTION:

Tuberculosis can affect almost any part of the body, yet lungs are the commonest organs to be affected.[1] About 85% of the total cases are believed to have pulmonary involvement. These patients manifest diverse signs and symptoms that vary with age, sex and the associated socio-environmental as well as host factors. The present study tried to find out any change in the epidemiological pattern of Pulmonary Tuberculosis among patients undergoing treatment at Tuberculosis Units [including all the DOTS centres under each TU] in both urban and rural areas of Lucknow in Uttar Pradesh where TB has remained as a big health challenge despite implementation of full-fledged RNTCP.

Material and methods: The cross sectional study was carried out after obtaining ethical clearance from August 2008 to September 2009 at the Tuberculosis Units [including their DOTS centres] of Lucknow district which was believed to be successfully implementing the Revised National Tuberculosis Control Programme. A statistically valid representative sample of 400 pulmonary tuberculosis patients was studied using multi-stage sampling technique. In the first stage all the eight existing Tuberculosis Units of Lucknow were segregated into urban and rural tuberculosis units. In the second stage two urban and two rural tuberculosis units were selected by lottery meth-

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od. In the third stage the required sample was collected by choosing every alternate pulmonary tuberculosis patient coming for treatment who had already completed one month of treatment at tuberculosis units. Extra-pulmonary tuberculosis patients and the pulmonary tuberculosis patients who had not completed one month of treatment at the time of study were excluded from the study. The data was collected using a structured and pretested questionnaire after valid consent. Statistical analysis used: Results were expressed in percentage. The Chi-square test of Independence was used to find out any statistical association between the variables. The whole exercise was performed using SPSS-16 software.

RESULTS:

Types of patient	Rural No.[%]	Urban No.[%]	Total No.[%]
New	142[71.0]	149[74.5]	291[72.8]
Transferred in	1[.5]	2[1.0]	3[.8]
Default	17[8.5]	25[12.5]	42[10.5]
Relapse	30[15.0]	22[11.0]	52[13.0]
Failure	2[1.0]	0[.0]	2[.5]
Others	8[4.0]	2[1.0]	10[2.5]
Total	200[100.0]	200[100.0]	400[100.0]

(p=0.114)

Table 1: Pulmonary tuberculosis patients by their area of residence

From Table No.-1, it is clear that both in Rural and Urban study areas, New cases accounting for the highest case load. In rural areas 71.0% patients were new cases where as 74.5% were New cases in urban areas. There were differences in the numbers of Default and Failure cases between the areas i.e. more Defaulters than Relapse cases in urban areas [12.5% Defaulters Vs 11% Relapse], where as more Relapse cases than Defaulters in rural areas [15% Relapse cases Vs 8.5% Defaulters] No statistically insignificant association between types of patients in relation to their area of residence was found.

Symptoms	Duration			Total n= [400] No.[%]
	1-2 weeks No.[%]	3-5 weeks No.[%]	>5weeks No.[%]	
Cough	41 [11.1]	42 [11.3]	288 [77.6]	371 [92.8]
Expectoration	29 [10.5]	38 [13.8]	208 [75.7]	275 [68.8]
Haemoptysis	80 [69.6]	8 [7.0]	27 [23.4]	115 [28.8]
Fever	16 [5.0]	36 [11.2]	269 [83.8]	321 [80.2]
Weight loss	7 [4.7]	5 [3.4]	137[91.9]	149 [37.2]
Night sweat	6 [4.5]	9 [6.7]	119 [88.8]	134 [33.5]
Breathlessness	18 [11.0]	22 [13.4]	124 [75.6]	164 [41.0]
Others	6 [11.1]	16 [29.6]	32 [59.3]	54 [13.5]

Table 2: Pulmonary tuberculosis patients attending TUs and their presenting symptoms along with duration

Cough remained the most common complaint to seek medical care [92.8%], followed by fever [80.2%] and expectoration [68.8%]. About 89% had cough for >2 weeks, of which a good 77.6% had had duration of cough for more than 5 weeks. About 75.7% of patients having expectoration had it for more than 5 weeks after which medical care was sought. Among patients with breathlessness, 75.6% had this symptom for more than 5 weeks. Among the patients who had haemoptysis 69.6% had its duration less than 3weeks.Overall majority of patients had had various symptoms for more than 5weeks before they sought medical care.

Age [in years]	Sputum smear Positive	Sputum smear Negative	Total
	No.[%]	No.[%]	No.[%]
≤14	12 [4.0]	12[11.8]	24[6.0]
15-24	102 [34.2]	40[39.2]	142[35.5]
25-34	86 [28.8]	22[21.5]	108[27.0]
35-44	42 [14.1]	11[10.8]	53[13.2]
45-54	34[11.4]	7[6.8]	41[10.2]
55-64	14[4.7]	8[7.8]	22[5.5]
65+	8 [2.6]	2[1.9]	10[2.5]
Total	298 [100.0]	102 [100.0]	400 [100.0]

Table 3: Distribution of pulmonary tuberculosis patients according to sputum smear status in relation to age

Table-3 shows that, the sputum positive cases account for 74.5% of the total cases. In total 75.2% of the Tuberculosis population belonged to the middle aged group between 15 and 45 years which is the most productive age group. A statistically significant association was observed between the age of the patients and sputum smear status.

Table-4 clearly shows the presenting complaints of patients with pulmonary TB. In all age groups cough remained the commonest presenting complaint followed by fever, expectoration. Both cough and expectoration has the risk of transmitting the infection. The constitutional symptoms like breathlessness, night sweat and haemoptysis were the less common reasons for seeking medical care.

Table-5 shows that, 80.6% sputum smear- positive had smoking history whereas 72.6% smear-negative patients had smoking history. No statistically insignificant association was found between smoking history and sputum smear status

Table-6 shows that, patients who had expectoration, 77.5% were sputum found to be smear positive, where as sputum smear positivity was 68.0% in patients who did not have expectoration. No statistically significant association was found between the patients with symptom of expectoration and their smear positivity.

Among patients who were having haemoptysis 75.7%

Symptoms	Age [years]						
	≤14 [n=24] No [%]	15-24 [n=142] No [%]	25-34 [n=108] No [%]	35-44 [n=53] No [%]	45-54 [n=41] No [%]	55-64 [n=22] No [%]	65+ [n=10] No [%]
Cough [n=371]	24 [100]	128 [90.1]	103 [95.4]	47 [88.7]	40 [97.6]	19 [86.4]	10 [100]
Fever [n=321]	18 [75.0]	114 [80.3]	93 [86.1]	38 [71.8]	31 [75.6]	19 [86.4]	8 [80.0]
Expectoration [n=275]	13 [54.2]	97 [68.3]	72 [66.7]	38 [71.7]	28 [68.3]	18 [81.8]	9 [90]
Breathlessness [n=164]	6 [25.0]	52 [36.6]	46 [42.6]	19 [35.8]	22 [53.7]	11 [50.0]	8 [80.0]
Weight loss [n=149]	4 [16.7]	42 [29.6]	45 [41.7]	21 [39.6]	16 [39.0]	15 [68.2]	6 [60.0]
Night sweat [n=134]	5 [20.8]	37 [20.1]	40 [37.0]	18 [34.0]	17 [41.5]	12 [54.5]	5 [50.0]
Haemoptysis [n=115]	4 [16.7]	44 [31.0]	27 [25.0]	19 [35.8]	11 [26.8]	8 [36.4]	2 [20.0]
Others [n=54]	3 [12.5]	23 [16.2]	12 [11.1]	7 [13.2]	4 [9.8]	4 [18.2]	1 [10.0]

Table 4: Distribution of pulmonary tuberculosis patients according to their age and presenting symptoms

had sputum positive status while those who did not 74.0% had sputum smear positive status. There was no statistically significant association between the symptom haemoptysis and sputum smear positivity.

Smoking history	Sputum status	
	Positive No [%]	Negative No [%]
Yes[n=93]	75 [80.6]	18[19.4]
No[n=307]	223[72.6]	84[27.4]

Table-5: Distribution of pulmonary tuberculosis patients attending TUs according to sputum status by regular smoking history for the past 5 years.

Sputum status	Expectoration		Haemoptysis	
	Present [n=275]	Absent [n=125]	Present [n=115]	Absent [n=285]
	No [%]	No [%]	No [%]	No [%]
Positive	213[77.5]	85[68.0]	87[75.7]	211[74.0]
Negative	62[22.5]	40[32.0]	28[24.3]	74[26.0]
	(p=0.207)			(p=0.071)

Table-6: Distribution of pulmonary tuberculosis patients attending TUs according to sputum smear status by symptoms

DISCUSSION:

New cases constitute the highest proportion of tuberculosis patients as a whole and both in rural and urban areas. In the present study 71% cases in rural TUs and 74.5% cases in urban TUs belong to new cases. Studies conducted earlier had shown that New cases were the predominate category of patients.[2,3,9,15] The result implies that proportion of new cases is relatively higher than those undergoing treatment .i.e. the cumulative number of TB cases is still raising. The relapse cases and defaulters together constitute 23.5% of the total cases which indicates about 1/4th cases the treatment did not seem to be effective. The reason could be either lack of compliance or ineffective management in treating the patients which points at the operational efficacy of the RNTCP in the district. Earlier studies have also shown similar findings. [2]

The observation also found out that more defaulters were from urban areas where as relapse cases are more in rural areas which is against the general perception as urban people seem to be more health concerned and have convenient access to health services. The reason could be attributed to lack of adherence to treatment in rural areas and diminished compliance in urban areas.

Cough has remained the commonest symptom [92.8%] of tuberculosis followed by fever [80.2%], expectoration and breathlessness and this pattern was seen among all the age groups. This coincide the normal epidemiological pattern of presentation of pulmonary tuberculosis and is in agreement with the results of previous studies.[1,4,5,6] Interestingly of those

presented with cough, 88.9% had had cough for more than 2 weeks of which, 87.7% had had more than 5 weeks of cough before turning to TB units for treatment. Cough for >2 weeks before treatment was the usual symptom of TB.[5] In Lucknow the finding has epidemiological significance as >5 weeks is very long period to transmit the infection to a good number of people. It also reflects the pattern of health seeking behaviour in the Lucknow district despite close proximity of effective services to people.

The middle age group between 15 and 45 years were the worst affected in the study accounting for 75% of all cases as previous studies indicated.[2,7,6,8] Sputum positive pulmonary TB remained the commonest form with 74.5% cases as had been documented earlier.[2,7,8,13] There was a great variation in the proportion of sputum positivity among pulmonary TB patients accounting for 50-70% cases in studies, yet remaining dominating pulmonary form. The statistically significant association [df-6, $p<0.04$] observed between the sputum positivity and age needs further study for its confirmation. The study intended to find out the effect of smoking on the sputum status of the patients. Smoking history had been considered as a risk factor for pulmonary TB in many studies.[21,22,23] As noted earlier 80.6% of smokers found to be sputum positive as compared to 72.6% in non-smokers. It failed to find out any significant association between smoking and sputum positivity among pulmonary TB patients. Further studies are required to establish for this fact if it exists.

Haemoptysis indicates the severity where as expectoration related to the risk of transmitting the disease, both have epidemiological significance. Though 77.5% of patients with expectoration had positive sputum and 68% without expectoration had positive sputum, yet no definite association was noted in the study. A great number of studies are needed to determine if any association does exist.

CONCLUSION:

Pulmonary tuberculosis in Lucknow had the usual epidemiological pattern as seen elsewhere. New cases contribute the highest proportion of cases followed by defaulters and relapse cases. Sputum positivity status had a significant association with age of the patients with this disease.

SUGGESTIONS:

On the whole, the study replicated the usual epidemiological behaviour of pulmonary tuberculosis with similar patterns of presentation like cough, fever, expectoration etc. It also upheld the fact that the more vulnerable are the most productive group of the society. What was more surprising was the health seeking behaviour of people. An important goal of any public health programme is to bring about a definite and visible positive change in their health seeking behaviour apart from getting appropriate treatment, which the study failed to notice in Lucknow. Despite the availability of free, effective services at hand, people still sought services of health facilities long after the illness had begun which in case of tuberculosis may prove detrimental. The district still needs to look after this aspect with more seriously to address this behaviour of people.

REFERENCES:

1.TB India 2009.

2.Ma. Imelda D. Quelapio, Nona Rachel C. Mira, Michael R Abeleda, Rivera R N Alicia B, B.S.M.T., Thelma E. Tupasi, M.D., Grimaldo Ephraim R, B.S.M.T., Nellie V Mangubat, B.S.F.T., Virgil A. Belen, R.N. and Jerose O. Derilo, B.S.M.T .Hospital-based Directly Observed Therapy-Directly Observed Therapy-Short-Course [DOTS] at the Makati Medical Centre . Phil Journal of Microbiology and Infectious Diseases 2000; 29[2]:80-86.

3.Chandrasekaran V, Gopi P G, Shantha T, Subramani R, Narayanan P R. Status of reregistered patients for tuberculosis treatment under DOTS programme. Indian Journal of Tuberculosis 2007; 54:12-16.

4.El-Khushman H, Momani JA, Sharara AM, Haddad FH, Hijazi MA, Hamdan KA, et al. The pattern of active pulmonary tuberculosis in adults at King Hussein Medical Center, Jordan. Saudi Med Journal 2006;27[5]:633-6.

5.Ngadaya Esther S , Mfinanga Godfrey S , Wandwalo Eliud R,Odd Morkve. Detection of pulmonary tuberculosis among patients with cough attending outpatient departments in Dar Es Salaam, Tanzania: does duration of cough matter? BMC Health Services Research 2009; 9:112.

6.National sample survey[ICMR] 1955-58.

7.Aktogu S, Yorgancıoglu A, Çırak K, Köse T, Dereli.S.M. Clinical spectrum of pulmonary and pleural tuberculosis . Eur Respir Journal 1996; 9: 2031–35.

8.Abal Adnan T , Jayakrishnan B, Parwer Shahid, Khadadah Abdul Salam El Shamy Mousa, Ayed Adel , Alawi Alia Al. Demographic Pattern and Clinical Characteristics of Patients with Smear-Positive Pulmonary Tuberculosis in Kuwait. Med Princ. Pract 2005; 14:306-12.

9.Bisoi Sukamal, Sarkar Amitabha, Mallik Sharmila, Haldar Anima, Haldar Dibakar. A Study on Performance, Response and Outcome of Treatment Under RNTCP in a Tuberculosis Unit of Howrah District, West Bengal. Indian journal of community medicine. [2007-10 - 2007-12]; 32: 4.

10.Rizwan Aziz, Abdur Rab Khan, Iftkhar Quaum Modood Ulmannan. Presentation of pulmonary tuberculosis at AYUB teaching hospital Abbottabad. 2002;14[1]:6-9.

11.Norma Pinheiro Franco Severo, Clarice Queico Fujimura Leite, Marisa Veiga Capela, Maria Jacira da Silva Simões.Clinical and demographic characteristics of patients hospitalized with tuberculosis in Brazil between 1994 and 2004. Journal bras. Pneumol 2007Sept./Oct; 33 [5]

12.The National Sample Survey [ICMR] 1954-56.

13.Bhat Sunil, Sarin Rohit, Jaiswal Anand, Choudhary Anil, Singla Neeta and Mukherjee Subroto.Revised national tuberculosis control programme: an Urban experience. Indian Journal of Tuberculosis 1998; 45: 207.

14.Bhatnagar Sailendra. Distribution of pattern of tuberculosis patients attending district tuberculosis centre ,Bijnor ,uttar pradesh.NTI bulletin 2000;36[1/2]:11-12.

15.V.Chandrasekaran,P.G.Gopi,T.Shantha,R.Subramani and P.R.Narayanan. Status of reregistered patients for tuberculosis treatment under DOTS programme. Indian Journal of Tuberculosis. 2007; 54:12-16.

16.Sudha Ganapathy, Beena E Thomas1, M S Jawahar, K Josephine Arockia Selvi, Sivasubramaniam et al.Perceptions of gender and tuber-

culosis in a south indian urban community. Indian Journal of Tuberculosis 2008; 55:9-14.
17.Rawat jagdish, Sindhwani,Juyal Ruchi. Clinico-radiiological profile of new smear positive pulmonary tuberculosis cases among young adults and elderly people in a tertiary care hospital at Dehradun [Uttarakhand].Indian journal of tuberculosis.2008;55:84-90.
18.Gopi PG, Subramani R, Santha T, Chandrasekaran V, Kolappan C, Selvakumar N, Narayanan PR. Estimation of burden of tuberculosis in India for the year 2000. Indian Journal Med Res 122. 2005 ;243-48.
19.Singla R, Sarin R, Khalid U.K, Mathuria K, Singla N, Jaiswal, A, Puri M.M, Visalakshi P, Behera D .Seven-year DOTS-Plus pilot experience in India: results, constraints and issues. The International Journal of Tuberculosis and Lung Disease 2009 August; 13[8]: 976-81.
20.Times of India Reports . 2006 Jul 31.Tuberculosis In Northern India Has Higher TB Prevalence Than Rest of Country.
21.Dong B, Ge N, Zhou Y. Smoking and alcohol consumption as risk factors of pulmonary tuberculosis in Chengdu: a matched case-control study. Hua Xi Yi Ke Da Xue Xue Bao 2001;32[1]:104-6.
22.Lienhardt C, Fielding K, Sillah JS, Bah B, Gustafson P, Warndorff D, et al. Investigation of risk factors for tuberculosis: a case-control study in three countries in West Africa. International Journal of Epidemiology 2005 ;34[4]:914-23.
23.Chi C Leung, Teresa Li, Tai H Lam, Wing W Yew, Wing S. Law, et al. Chang. Smoking and Tuberculosis among the Elderly in Hong Kong American Journal of Respiratory and Critical Care Medicine 2004; 170: 1027-33.

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