

Original Research Article

Clinico-radiological pattern of pulmonary tuberculosis with diabetes mellitus

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ABSTRACT

Background: The link between diabetes mellitus and tuberculosis has been recognised for centuries. There is growing evidence that diabetes mellitus is an important risk factor for tuberculosis and might affect disease presentation and treatment response. The increase in burden of tuberculosis (TB) and diabetes mellitus (DM) is hitting certain Asian countries harder than other areas. In a global estimate, 15% of all TB cases could be attributable to DM, with 40% of those cases coming from India and China.

Methods: It is a cross-sectional observational study with 50 TB patients with DM admitted in department of respiratory medicine Smt. B. K. Shah Medical Institute and Research Centre, Piparia, Waghodia, Vadodara, Gujarat, India total 6 months duration patients were included in the study (2015).

Results: Total 50 cases were included in the study. The ratio of male: female was 7:3. Age group of 40 years and 60 years was high. Haemoptysis and weight loss were major complaints. There was a higher involvement of lower lung field (56%) as compared to upper lung field. Bilateral involvement was present in (18%). Cavitory lesions were present in (18%) cases and were more frequently confined to upper lung field (62%, 5/9). Total 27 patients of pulmonary TB were first time detected with DM among them 20 patients had higher bacillary load (sputum >2+) and out of 27 newly detected DM patient 15 required insulin.

Conclusions: Tuberculosis and DM have strong correlation and patients with diabetes mellitus has high probability of getting infected with tuberculosis.

Keywords: Bacillary load, Diabetes mellitus, Insulin, Tuberculosis

INTRODUCTION

Tuberculosis and diabetes mellitus are two serious public health problems globally, which not only often coexists also has serious implications on each other. In countries like India, the huge prevalence of DM, may be contributing to the increasing prevalence of TB. TB has a significant impact on DM, causing unmasking of DM and poor control. On the other hand, DM has an impact on

clinical features, radiological presentation, diagnosis, management and treatment outcomes of TB. Diabetes mellitus (DM) is a serious lifelong disease that has been increasing in prevalence year after year. In 2012, it caused 1.5 million deaths worldwide. The global prevalence has increased from 4.7% to 8.5% since the 1980s, and in 2014 it was estimated that 422 million of adults were living with DM. Worldwide, there are an estimated 9.6 million new patients with active TB

annually¹ WHO and of them, 1 million have both TB and DM.²

The response to the growing HIV-associated TB epidemic in the 1980s and 1990s was slow and uncoordinated, despite clearly articulated warnings about the scale of the forthcoming problem. We must not make the same mistake with diabetes and TB.³

Even though awareness about the possible consequences of the dual disease now exists in almost all Asian countries with a high TB-DM burden.

METHODS

It is a Cross-sectional observational study. Total 50 TB patients with DM admitted in Department of Respiratory Medicine, Smt. B. K. Shah Medical Institute and Research Centre, Piparia, Waghodia, Vadodara, Gujarat, India for 6 months (2015) duration.

Inclusion

- Patients who have constitutional symptoms of tuberculosis
- Patients who are older than 18 years of age
- Patients who are sputum positive tuberculosis.
- History of diabetes mellitus.

Exclusion

- Less than 18 years age
- Not giving consent for the study
- DR Tuberculosis
- Patients aged more than 18years were enrolled. They underwent the questionnaires to assess their medical history and symptoms
- Tuberculosis was confirmed by sputum Z N STAIN TEST
- Diabetes was checked by Blood sugar and HbA1c
- Distribution of pulmonary lesion was described on the basis of chest X-ray.

RESULTS

Total 50 cases were included in the study. The ratio of male: female was 7:3 The number of patient between age group of 40 years and 60 years was high. We found out fewer patients with complain of hemoptysis and weight loss. There was a higher involvement of lower lung field (56%) as compared to upper lung field. Bilateral involvement was present in (18%).

Cavitary lesions were present in (18%) cases and were more frequently confined to upper lung field (62%, 5/9). Total 27 patients of pulmonary TB were first time detected with DM among them 20 patients had higher bacillary load (sputum >2+) and out of 27 newly detected DM patient 15 required insulin.

Table 1: Age and sex distribution.

Age years	Sex	
	Male	Female
<40	4	1
40-60	30	13
>60	1	1
Total	35	15

Table 2: X-ray lesions distribution.

Chest x-ray	RT	LT	Total
Upper lung field	11	2	13 (26%)
Lower lung field	13	15	28 (56%)
Bilateral lung field			9 (18%)

Table 3: X-ray lesions distribution.

	With recent DM (28)	In known DM (22)	Total (60)
Rt Uz Nh opacity	2	5	7
Rt Uz cavity	1	3	4
Lt Uz Nh opacity	0	1	1
Lt Uz cavity	1	0	1
Rt Lz Nh opacity	6	5	11
Rt Lz cavity	2	0	2
Lt Lz Nh opacity	9	5	14
Lt Lz cavity	1	0	1
Bl opacity	6	3	9 (18)

Table 4: Bacillary load with diabetes.

DM	Total	Sputum			
		Neg	1+	2+	3+
Recent	27	4	3	8	12
Old	23	2	4	7	10

Table 5: Treatment distribution of patients.

	Old	New	Total
On insulin	11	15	26
On oral hypo-glycaemic	12	12	24
Total	23	27	

DISCUSSION

Qayyum et al in their study of diabetic group in Pakistan between July to December 2004, shown found bilateral lung field involvement in 44.44%, and in lower lobe it was 33.33%.⁴

Wilcke JT et al and Kubam C et al proved lower lobe involvement as a predominant find in the patients.^{5,6}

Tiyas Sen et al in their study of diabetic group in Mumbai in 2009 found more TB-DM patients developed cavitation (82% versus. 59%) more often in the lower

lung fields (29% versus. 3%). Cavities were more often multiple in the TB-DM patients (25%).⁷

Table 6: Treatment distribution of patients.

DM with TT		Sputum				Total
		Neg	1+	2+	3+	
New DM recent on TT	Actrapid	0	2	2	4	8
	Mixtard	0	0	4	3	7
	Oral	4	1	2	5	12
	Total	4	3	8	12	27
Known DM om TT	Actrapid	0	0	4	2	6
	Mixtard	0	3	1	1	5
	Oral	2	1	2	7	12
	Total	2	4	7	10	23
Total		6	7	15	22	50

The best time to screen TB patients for DM has not been defined either. Although screening at the time of registration would be easiest, stress-induced hyperglycemia may lead to false-positive diagnoses. On the other hand, if the screening is performed at the end of the initial or continuation phase, the possibility of early DM intervention or TB treatment improvement will be lost.

CONCLUSION

There was a higher involvement of lower lung field (56%) as compared to upper lung field. But Cavitory lesions were confined to upper lung field. Lower zone lesions were more common in patients with recently diagnosed/uncontrolled diabetes. Whereas, no differentiation was seen with controlled diabetes. The study observed that in pts with extensive pulmonary TB most of them were having blood sugar level above 300 mg% on admission. Blood sugar fluctuation is far more significant in patient with pulmonary TB with DM.

Diabetic patients presenting with lower lung field lesions, possibility of TB should always be considered for prompt diagnosis and management. As per with new 2016 RNTCP guidelines blood sugar and serology should have been done in screening. Insulin requirement for the control of the blood sugar level in patients with pulmonary TB doesn't depend on the bacteriological and radiological extent of disease.

We emphasize the need for TB control programs to target patients with diabetes for active case findings and efforts for early detection and treatment of DM--which may have a beneficial impact on TB control.

We look forward to doing further studies for assessing how TB risk varies by type, duration, and severity of DM for a more thorough understanding of the association.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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