



RESPIRATORY COMORBIDITES IN DIABETES MELLITUS

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ABSTRACT **AIMS AND OBJECTIVES** 1.To study prevalence of respiratory co-morbidities among case of type 2 diabetes mellitus.2. Demographic evaluation of patients with respiratory diseases in type 2 diabetes mellitus.3. To investigate morbid relationship between diabetes mellitus and respiratory diseases.4 To evaluate causal association of diabetes mellitus with respiratory diseases.

MATERIALAND METHODS

A prospective study of 100 random known cases of diabetes Mellitus type 2 during the period of August 2017 to 2019.

RESULT

Respiratory complications, in general, were found to be more prevalent in patients who had the following characteristics: advanced age, poor diabetic control, smoking, obesity.

KEYWORDS :**INTRODUCTION**

Diabetes Mellitus (DM) is considered as a metabolic disorder of multiple etiologies (genetic and environmental). It is characterized by chronic hyperglycemia due to absolute or relative insulin deficiency (defects in either insulin secretion or insulin action or both). This results in disturbances of carbohydrate, protein and fat metabolism. The major side effects of diabetes mellitus are due to its microangiopathic and macroangiopathic complications, which affect eyes, kidneys, nerves, heart, major vessels, and the lungs. Diabetes mellitus Type 2 or NIDDM, is characterized by insulin resistance and impaired insulin receptors. It is a common type of diabetes and usually develops after the age of 40 years. The lung was targeted in diabetic microangiopathy, histopathology showed basal lamina thickening and fibrosis. The lung is rich in micro-vascular circulation and abundant connective tissue that raises the possibility of lung affection by microangiopathic process and non-enzymatic glycosylation of tissue proteins, induced by chronic hyperglycemia, rendering the lung a "target organ" in diabetic patients. The normal lung mechanics and gas exchange are influenced by the integrity of pulmonary connective tissue and microvasculature, so any abnormalities in either of the two structural components lead to abnormal pulmonary function tests (PFT). The association between diabetes and impaired lung function was noticed and necessitated attention. Diabetes Mellitus is associated with increased levels of systemic inflammatory mediators and inflammatory markers which together with microangiopathy are accused in alterations of lung matrix proteins and hence the impairment of pulmonary functions. It is likely that persistent inadequate blood glucose control over time may alter the regulation of inflammatory pathways that are involved in pulmonary function impairment; this impairment is mainly infective and non-infection.

RESULT AND OBSERVATION

Result shows the age distributions, the maximum number of patients was shown in the 5th decade 49 (49%) while minimum numbers of patients were seen in the 4th decade 9(9%).

The study shows the symptomatology where patients had most symptoms of cough and dyspnea 84(84%) and 76(76%) respectively and 48(48%),42(42%),31(31%),6(6%) had a fever, expectoration, wt. loss, chest pain respectively

Table 1: Respiratory disorders in diabetic patients (n-100)

Complications	Number of patients (%)
Tuberculosis	28(28%)
Bacterial pneumonia	14(14%)
Fungal pneumonia	6(6%)
Bronchial asthma	7(7%)
ILD	14(14%)
OSA	12(12%)

COPD	15(15%)
Lung abscess	4(4%)
TOTAL	100(100%)

Table 1 shows the respiratory disorders in diabetic patients (n-100) where maximum number of patients had Tuberculosis 28(28%), Bacterial pneumonia 14 (14%), ILD 14 (14 %), COPD 15(15%), OSA 12(12%) and minimum patients in Fungal pneumonia 6(6%), Bronchial asthma 7(7%), Lung abscess 4(4%).

Table 5 shows spirometry observation in diabetic patients (excluded tuberculosis, pneumonia, lung abscess)

Out of 20(41%) restrictive patterns, 11(23%) had ILD and 9(19%) had OSA. Out of 16(33%) obstructive pattern, 5(10%) had Bronchial asthma, 10(21%) had COPD, and 1 (2%) had OSA and 12(25%) patients could not perform it properly.

DISCUSSION

Study shows the comparative ages in various studies. The ages in Mohan et al and Ramachandran et al was compared to present study belonged to the age group 51-60(49%) while in both Mohan et al and Ramachandran et al was seen the highest prevalence in age group 51-60(32% and 30% respectively) therefore diabetes type 2 was more common after 50 years of age.

The study shows the prevalence of COPD in the present study was 15(15%) as compared to the Chelsey George study was 92 (21%) and in Bronchial asthma, 7(7%) as compared to George's study had 59(13%).

The study shows the prevalence of ILD in the present study was 14(14%) as compared to Thomas's Fleming study was 22(20%).

Table 1: Comparative prevalence of tuberculosis in diabetes

Characteristics	Present study(n-100)	Blanca study(n-130)
Tuberculosis	28(28%)	25(29%)
Age mean	50(13%)	49(13%)
Gender female	16(57%)	32(37%)
Smoking	16(57%)	24(27%)

Table 1 shows the comparative prevalence of tuberculosis with Blanca study (bull world health organ) in the present study were 28(28%) tuberculosis and in Blanca study were 25(29%). In the present study, tuberculosis was maximum (13%) in 50-60 yrs. and in Blanca study was 49 yrs. (13%). In gender 16(57%) females had tuberculosis in the present study and in Blanca study was 32(37%). 16(57%) had smoking-associated in the present study and in Blanca study was 24(27%).

SUMMARY AND CONCLUSION

In the present study, the mean age of respiratory symptomatic diabetic patients was approximately 54 years and 61 patients were male and 39 patients were female.

Respiratory complications, in general, were found to be more prevalent in patients who had the following characteristics: advanced age, poor diabetic control, smoking, obesity.

Respiratory disorders in symptomatic diabetic patients found were Tuberculosis 28%, Bacterial pneumonia 14%, ILD 14%, COPD 15%, OSA 12%, Fungal pneumonia 6%, Bronchial asthma 7% and Lung abscess 4%.

The most common respiratory Symptom of diabetic patients has a cough (84%). Fungal pneumonia, Tuberculosis, bacterial pneumonia, and lung abscess were more prevalent in uncontrolled diabetes (>176g/dl). The absolute eosinophil count was normal in bronchial asthma patients. In this study, it was found that 33% of patients had less than 50kg weight and 10% had greater than 61kg weight out of 100 patients where 41% male had less than 50kg weight and females had 46% less than 40kg weight.

In this study, out of 76 dyspnea symptomatic diabetic patients where male patients had 39% mMRC grade 2, and 14% mMRC grade 3. In female patients had 63% mMRC grade 2 and 4% mMRC grade 3. No patients in mMRC grade 4.

In this study ,20% Male patients had BMI <18.5kg/m² and 24% had BMI >30kg/m². In this study, 51% Female patients had BMI <18.5kg/m² and 10% had BMI >30kg/m².

In this study out of 48 spirometry of symptomatic diabetic patients where 41% of patients had a restrictive pattern, 33% had an obstructive pattern and 25% of patients were unable to perform properly. In addition, Restrictive patterns, 23% had ILD and 19% had OSA. In an obstructive pattern, 10% had Bronchial asthma, 21% had COPD, and 2% had OSA and 25% of patients could not perform it properly.

In this study, Sputum smear AFB examination of diabetic patients in which 21% of patients were sputum positive and 79% of patients were negative. IN this study symptomatic diabetic patients showed 6% drug-resistant tuberculosis and 3% had H-mono resistance and 3% had multi-drug resistance.

In this study, we found 2% KAT G mutation and 1% (INH A+KAT G) mutation. In this study, 3% had fluoroquinolone resistance, 1% SLID resistance. In respiratory symptomatic diabetic patients found 14% had positive bacterial culture and 6% had positive fungal culture.

The most common organism found in bacterial pneumonia was streptococcus pneumonia and aspergillus fungi in fungal pneumonia. Chest x-ray observation in symptomatic diabetic patients according to the side where it showed 40% of patients have had unilateral chest x-ray lesion and 44% of patients had bilateral chest x-ray lesion. ,16 patients had a normal chest x-ray.

High-resolution chest CT scan where UIP 7% and NSIP pattern 7% patients. In this study, out of 12 OSA patients, 58% of patients had mild obstructive sleep apnea.

The diabetic symptomatic patients whose ages between 51-60 years have had 46% Tuberculosis,57% Bacterial pneumonia,66% Fungal pneumonia,57% Bronchial asthma,58% OSA, 75% Lung abscess and age between 61-70 years have had 46% COPD, 57% ILD. Increased risk of diseases like Tuberculosis, ILD, COPD, OSA, Bacterial pneumonia and lung abscess was found in diabetic smokers.

LIMITATION

We have taken only symptomatic respiratory diabetic patients so the sensitivity of this study is less. We have taken only type 2 diabetic patients excluding type 1. We have not included HBA1c. Mycobacterial culture was not done. Lung biopsy for ILD could not be done. A number of bronchial asthma patients was very small.

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