Original Research Article

A study of clinical findings among newly diagnosed TB patients who are diagnosed diabetics under medications

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Abstract

Background: Tuberculosis remains a leading cause of death globally. In 2014 there were an estimated 12.8 million new cases of tuberculosis worldwide. The incidence of tuberculosis is greatest among those with conditions impairing immunity such as HIV infection and diabetes. Type 2 Diabetes mellitus amongst Indians occur a decade earlier when compared to the western population. Indians have more abdominal obesity and the waist-hip ratio.

Aim of the study: Clinical findings Among Newly Diagnosed Tb Patients who are diagnosed Diabetics under Medications.

Materials and methods: 100 cases of newly diagnosed sputum positive pulmonary tuberculosis with diabetes were fitting the inclusion criteria admitted over the period of 2 years from 2016-2017. Subjects were selected from medicine ward, pulmonology ward andTuberculosis ward under DTC. The diagnosis of Pulmonary tuberculosis was made with clinical presentation and verification by detection of acid-fast bacilli under a microscope.

Results: Among the study population, 33(33.00%) were smokers, 38 (38.00%) were alcoholics and 9 (9.00%) were habituated to pan chewing. Among the study population, 53 (53.00%) had dyspnoea, 41 (41.00%) had chest pain, 66(66.00%) had a loss of appetite, 60 (60.00%) had an evening rise of temperature, 81(81.00%) had a loss of weight, 32 (32.00%) had hemoptysis, 78(78.00%) had a cough.

Conclusion: DM was associated with more symptoms but not with increased severity of TB and had a negative effect on the outcome of anti-TB treatment. The findings of this study underline the need to improve the care of patients with concomitant DM and TB, especially in developing countries. Therefore, we advocate screening patients with TB for DM, especially those aged >35 years.

Prospective studies are needed to determine the effects of tighter glycemic control on TB treatment and outcome.

Key words

Diabetes Mellitus, Smoking, Hematopoiesis, Dyspnea, Tuberculosis.

Introduction

Tuberculosis remains a leading cause of death globally. In 2014, there were an estimated 12.8 million new cases of tuberculosis worldwide. The incidence of tuberculosis is greatest among those with conditions impairing immunity such as HIV infection and diabetes [1]. The emerging epidemic of tuberculosis and diabetes mellitus has many impacts. Due to the coexistence of diabetes or underlying hyperglycemia alters the clinical presentation of tuberculosis [2]. Patients may not be having the classical presentation of cough and breathlessness and hence may be an early diagnosis will be missed [2]. For centuries tuberculosis have been known to affect the lung apices due to a ventilation-perfusion mismatch. In a patient with hyperglycemia, an atypical involvement of predominantly lower lung fields may confuse the physician in making a diagnosis [3]. The development of complications related to tuberculosis and its treatment is worse in diabetic compared to non-diabetics [4]. The sputum conversion is also delayed with lower rates of conversion in diabetic patients compared to nondiabetics. It is the most easiest and readily available diagnostic test. Primary Tb can affect the upper and middle lobes. Progressive disease is seen in upper lobes with cavitary lesions. Cavities are often thin walled, multiple and with intervening fibrosis. Bilateral lesions are almost always suggestive of tuberculosis [5]. Once cavitation and fibrosis have set in lesion may not heal with treatment. In the long course, there may be evidence of fibrosis, collapse and destroyed lung [6]. The goals of treatment include ensuring cure without relapse, to prevent death, to prevent spread and to prevent the development of resistance. Treatment consists of an active phase or intensive phase where all actively growing bacilli are killed. Also, a proportion of dormant organisms are also killed. In the continuation phase, the remaining persisting bacilli are eliminated. Adequate chemotherapy administered without interruption is the cornerstone of success [7].

Materials and methods

The Prospective noninterventional case-control study on clinical outcomes of sputum positive tuberculosis in newly detected diabetes patients in comparison to non-diabetic patients. The study was approved by the ethical committee of Government Mohan Kumaramangalam Medical College Hospital, Salem. 100 cases of newly diagnosed sputum positive pulmonary tuberculosis (50 diabetic and 50 nondiabetics) fitting the inclusion criteria admitted over the period of 2 years from 2016-2017. Subjects were selected from medicine ward, pulmonology ward andTuberculosis ward under DTC. The diagnosis of Pulmonary tuberculosis was made with clinical presentation and verification by detection of acid-fast bacilli under a microscope.

Inclusion criteria

- Age 18-75 years.
- Newly diagnosed sputum positive pulmonary tuberculosis cases.

Exclusion criteria

- Patients on steroids, thiazide diuretics,
- HIV patients,
- Sputum smear-negative Pulmonary tuberculosis cases and extrapulmonary tuberculosis,
- Patients not willing to participate.
- Pregnant women and women in a postpartum period less than 6 weeks of delivery
- Multidrug resistance Tuberculosis patients, the Known case of diabetes mellitus.

Statistical analysis

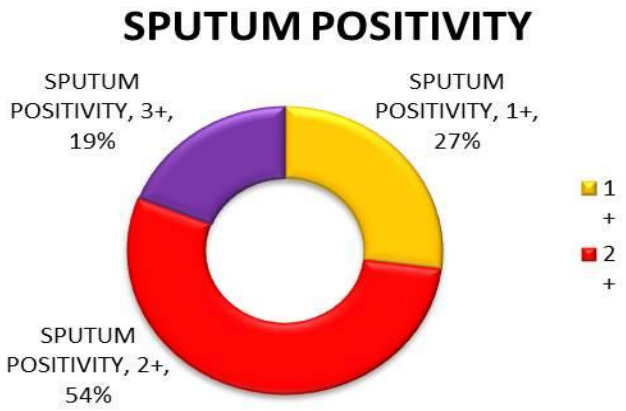
The data were analyzed using the SPSS V.17. All quantitative data were expressed as mean±SD. The comparison of means was done using the Student t test and the χ^2 test was used to compare proportions. The one-way analysis of variance procedure was used to compute the differences in mean and CI for quantitative data.

Results and Discussion

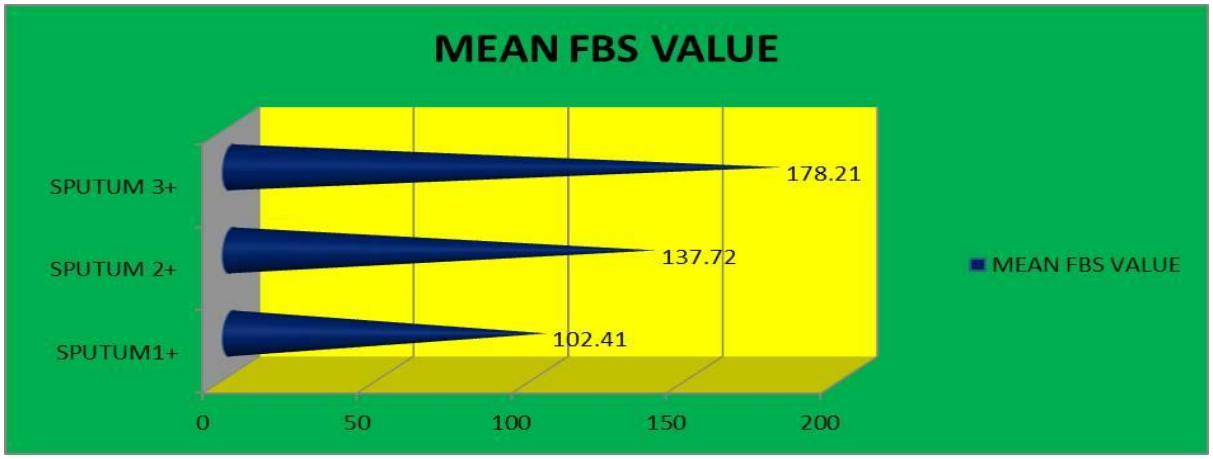
Among the study population of sputum positivity was 1+ , 2+ and 3+ in 27 (27.00%), 54 (54.00%) and 19 (19.00%) subjects respectively (**Graph – 1**).

The mean FBS had positivity 1 was 102.41 ± 20.32, 137.72 ± 44.22 had positivity 2 and 178.21 ± 58.58 had positivity 3. Considering sputum positivity 1 as the baseline, the mean difference of FBS (35.315) in positivity 2 was statistically significant (P value <0.001) and also positivity 3 (75.803) was statistically significant (P value <0.001) as per **Graph - 2**.

Graph – 1: Sputum positivity rates in study population.



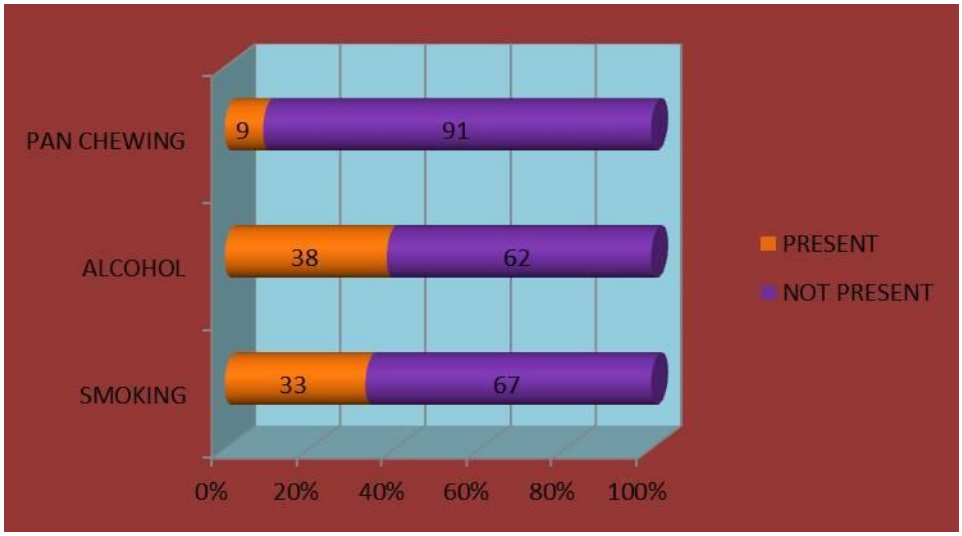
Graph – 2: Mean FBS value in each sputum positivity groups.



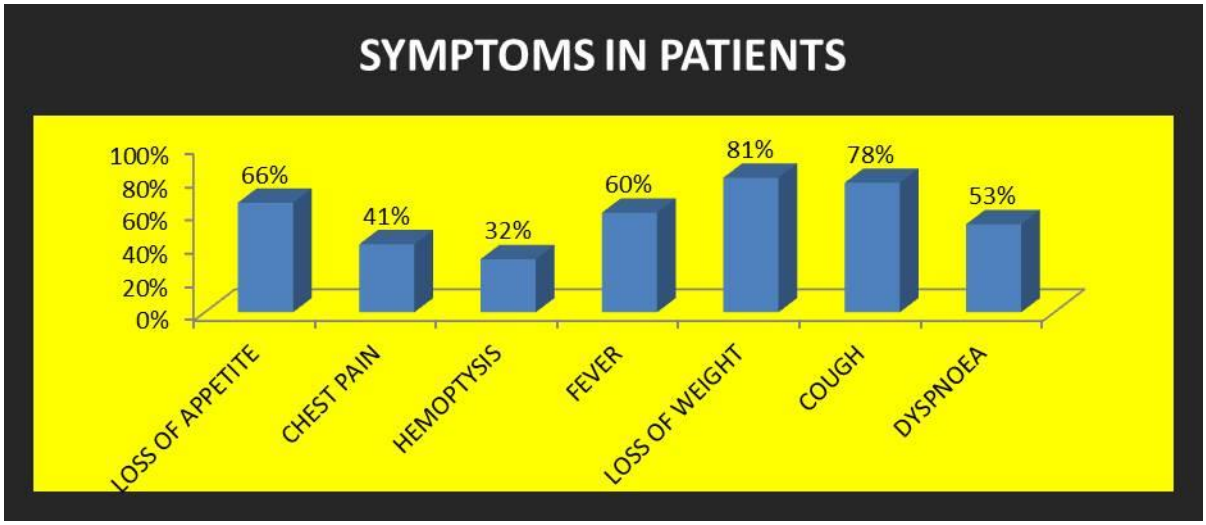
Among the study population, 33(33.00%) were smokers, 38 (38.00%) were alcoholics and 9 (9.00%) were habituated to pan chewing (**Graph – 3**).

Among the study population, 53 (53.00%) had dyspnoea, 41 (41.00%) had chest pain, 66 (66.00%) had a loss of appetite, 60 (60.00%) had an evening rise of temperature, 81 (81.00%) had a loss of weight, 32 (32.00%) had hemoptysis, 78 (78.00%) had a cough (**Graph – 4**).

Graph – 3: Risk factors in study population.



Graph – 4: Distribution of symptoms.



Discussion

Tuberculosis (TB) remains a leading cause of disability-adjusted life years in many regions of the world, particularly in low and middle-income countries. According to the World Health Organization (WHO), in 2013, an estimated 9.0 million people were with TB and of which 2 million cases were from India [8]. Further, recent scientific evidence has highlighted the increasing incidence of diabetes in LMIC. More than 371 million people all over the world had Diabetes Mellitus (DM) in 2012 as reported by the International Diabetes Federation (IDF). The WHO has projected that deaths attributable to diabetes may double between 2005 and 2030 [9]. Analyzing symptoms associated with tuberculosis, we found that dyspnoea, hemoptysis and chest pain were more among diabetics when compared to non-diabetics. Weight loss is thought to be more frequent in Tb with diabetes [10]. However in our study weight loss was seen more in non-diabetic patients. In a study by Mona Bashar et al, it showed more weight loss among diabetic patients. Few authors have suggested that there is not much difference in the clinical presentation of Tb among diabetics and nondiabetics. Low-grade fever and productive cough were the most common symptoms and were observed with almost equal frequency patients [11]. In our study, we observed higher rates of sputum 3+ positive and sputum 2+ positive patients among diabetics. A

study by Mugusi F, et al. reported a higher frequency of sputum negative smears in diabetic patients. Few studies show no association between sputum positivity and diabetic status. Another study looked at the effect of diabetes on the presentation of pulmonary TB patients. 46 Records of 692 smear-positive pulmonary TB patients admitted to a referral hospital in Riyadh, Saudi Arabia, were reviewed retrospectively [12]. The baseline characteristics of 187 patients with DM (TB-DM group) were compared to 505 patients without DM (TB group). In the TB-DM group, 65.2 % of the patients had numerous (>1bacillus per oil immersion field) AFB on the sputum smear examination compared to 54.1% in the control group. They established that TB-DM patients have an elevated pre-treatment bacillary load. DM was an independent risk factor associated with numerous AFB on sputum smear examination [13]. They explained that the immune suppression induced by DM could be responsible for the high bacillary load in TB patients with DM. Few studies did not reveal any relation between sputum conversion rates and diabetic status [14]. Poor diabetic control probably leads to sputum positive status at the end of the intensive phase [15]. Patients with a higher value of blood sugar at the beginning of treatment tend to remain sputum positive after the intensive phase, according to our study. In a study from Turkey, the bacteriological profile of 737 patients from 2000 to 2005 with pulmonary TB was studied [16]. Three hundred six (193 men and 113 women) patients newly diagnosed with pulmonary TB and HIV negative were evaluated [17]. Factors associated with both sputum smear and culture conversion time were studied. It was found that patients with DM, cavity disease and radiologically extensive disease tend to have longer sputum smear and culture conversion time than the other groups [18, 19].

Conclusion

DM was associated with more symptoms but not with increased severity of TB and had a negative effect on the outcome of anti-TB treatment. The findings of this study underline the need to improve the care of patients with concomitant DM and TB, especially in developing countries. Therefore, we advocate screening patients with TB for DM, especially those aged >35 years. Prospective studies are needed to determine the effects of tighter glycemic control on TB treatment and outcome.

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