Original Research Article

A study on adverse drug reaction associated co-morbid symptoms on newly diagnosed TB patients with and without diabetes mellitus

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Abstract

Background: The incidence of Tuberculosis and severity increased in immunocompromised state like Diabetes mellitus. When combined with ATT and antidiabetic drugs, the adverse reaction are increased.

Aim of the study: To study the incidence of adverse drug reaction associated co-morbid symptoms on newly diagnosed TB patients with Diabetes Mellitus.

Materials and methods: 100 cases of newly diagnosed sputum positive pulmonary tuberculosis (50 diabetic and 50 non -diabetic) fitting the inclusion criteria admitted over the period of 2 years from 2016-2017. Subjects were selected from medicine ward, pulmonology ward and Tuberculosis ward under DTC. The diagnosis of Pulmonary tuberculosis was made with clinical presentation and verification by detection of acid fast bacilli under microscope.

Results: Among the diabetic population, 28 (28.00%) were received biguanides, 10 (10.00%) were received insulin, and 12 (12.00%) were received sulphonylureas. Among the study population, 28 (28.00%) had peripheral neuropathy, 25 (25.00%) had liver injury, 4 (4.00%) had hypoglycemia, 11 (11.00%) had back pain, and 52 (52.00%) had nausea vomiting.

Conculsion: When treating patients with diabetes and TB, there is increased incidence of polyneuropathy and liver toxicity.

Key words

Drug reactions, Poor glycemic control, ATT.

Introduction

The incidenceof tuberculosis is greatest among those with immunocompromised state such as HIV infection and diabetes [1]. Diabetes Mellitus is an epidemic disease seen throughout the world. It is more observed in developed countries [2]. By 2030, the major burden will be shared by Asian and African countries. In 2014, according to ICMR, there are 73.4 million diabetics and 86.2 million prediabetics in India [3]. The prevalence is estimated to be 366 million worldwide by 2030. India will be having one-third of the disease burden. Type 2 Diabetes mellitus amongst Indians occur a decade earlier when compared to the western population. Indians have more abdominal obesity and waist-hip ratio. Also urbanisationand changing lifestyle adds to it [4].

Materials and methods

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

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 extra pulmonary tuberculosis,
- Patients not willing to participate.
- Pregnant women and women in postpartum period less than 6 weeks of delivery)
- Multi drug resistance Tuberculosis,
- Patients Known case of diabetes mellitus.

Those patients given ATT and Anti-diabetic drugs were monitored regularly. Adverse reactions like nausea, vomiting, peripheral neuropathy, Liver toxicity, Hypoglycemia and Back Pain were monitored. Liver injury was defined as clinical signs and symptoms of Toxic Hepatitis or elevation of enzymes more than 3 times normal. Peripheral neuropathy was diagnosed by symptoms and clinical examination.

Statistical analysis

The data were analyzed using SPSS V.17. All quantitative data were expressed as mean±SD. The comparison of means was done using the Student t test and χ^2 test was used to compare proportions between groups. The one way analysis of variance procedure was used to compute the differences in mean and CI for quantitative data. Patients were classified into two groups, that is, those with DM (KDM and NDM) and those without (no DM). We compared quantitative data between the two groups using the Student t test. p Values <0.05 were considered significant.

Results

The mean age of diabetic status was 51.1 ± 9 and non-diabetic was 34.2 ± 7.26 , and the mean difference (16.90) between two groups

was statistically significant (P value <0.001) as per **Table - 1**.

Among the study population, 28 (28.00%) hadperipheral neuropathy, 25 (25.00%) had liver injury, 4 (4.00%) had hypoglycemia, 11 (11.00%) had back pain, and 52 (52.00%) had nausea vomiting (**Table – 2**).

Among the diabetic, 19 (38%) had peripheral neuropathy. Among the non diabetic, 9 (18%) had peripheral neuropathy. The difference in the proportion of diabetic status between ADR peripheral neuropathy was statistically significant (P value 0.026) as per **Table – 3**.

Table - 1: Comparison of mean age across study groups (n=100).

Diabetic status	Age Mean± STD	Mean difference	95% CI		P value
			Lower	Upper	
Diabetics	51.1 ± 9	16.90	13.66	20.14	*<0.001*
Non diabetics	34.2 ± 7.26				

Table - 2: Descriptive analysis of ADR (adverse drug reaction) in study population (n=100).

ADR	Frequency	Percentage
ADR peripheral neuropathy	28	28.00%
Liver injury	25	25.00%
Hypoglycemia	4	4.00%
Back pain	11	11.00%
Nausea vomiting	52	52.00%

Table - 3: Association of diabetic status with ADR peripheral neuropathy of study population (n= 100).

ADR peripheral neuropathy	Diabetic status		Chi square	P-value
	Diabetics	Non diabetics		
YES	19 (38%)	9 (18%)	4.960	*0.026*
NO	31 (62%)	41 (82%)		

Table - 4: Association of diabetic status with liver injury of study population (n=100).

Liver injury	Diabetic status		Chi square	P-value
	Diabetics	Non diabetics		
YES	**15 (30%)**	**10 (20%)**	**1.333**	0.248
NO	**35 (70%)**	**40 (80%)**		

Table - 5: Association of alcohol with liver injury of study population (n=100).

Liver injury	Alcohol		Chi square	P-value
	Yes	No		
Yes	18 (47.37%)	7 (11.29%)	16.355	*<0.001*
No	20 (52.63%)	55 (88.71%)		

Among the diabetic, 15 (30%) had liver injury. Among the non-diabetic, 10 (20%) had liver injury. The difference in the proportion of diabetic status between liver injury was statistically not significant (P value 0.248) as per **Table – 4**.

Table - 6: Association of diabetic status with back pain of study population (n=100).

Back pain	Diabetic status		Chi square	P-value
	Diabetics	**Non diabetics**		
Yes	8 (16%)	3 (6%)	2.554	0.110
No	42 (84%)	47 (94%)		

Table - 7: Association of diabetic status with nausea vomiting of study population (N=100).

Nausea Vomiting	Diabetic status		Chi square	P-value
	Diabetics	**Non diabetics**		
Yes	16 (32%)	36 (72%)	16.026	***<0.001***
No	34 (68%)	14 (28%)		

Among the people using alcohol, 18 (47.37%) had liver injury. Among the people never using alcohol 7 (11.29%) had liver injury. The difference in the proportion of alcohol between liver injury was statistically significant (P value <0.001) as per **Table – 5**.

Among the diabetic, 8 (16%) had back pain. Among the non-diabetic, 3 (6%) had back pain. The difference in the proportion of diabetic status between back pain was statistically not significant (P value 0.110) as per **Table – 6**.

Among the diabetic, 16 (32%) had nausea and vomiting. Among the non-diabetic, 36 (72%) had nausea and vomiting. The difference in the proportion of diabetic status between nausea vomiting was statistically significant (P value <0.001) as per **Table – 7**.

Discussion

In our study the incidence of adverse reactions to anti tuberculosis drugs were variable. Patients with Diabetics and PT had increased incidences of peripheral neuropathy. This may be due to drugs like anti-diabetic drugs (Metformin) and ATT (INH). Regarding Liver injury it is more common in Diabetic and Tuberculosis patients and alcohol intake accelerates the Liver Injury. Presence of diabetes influences the adverse drug reactions. This is mostly attributed to the anti-diabetic medications. No large studies exist regarding evaluationof adverse drug reactions to ATT in diabetic patients [5].

Conclusion

Patients with diabetes and TB had more polyneuropathy than Nondiabetic Patient. Liver Toxicity seen in patients who are chronic alcoholic treated for diabetes and tuberculosis.

Acknowledgments

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