

Type 2 Diabetes Mellitus and Its Association with Various Infections: A Retrospective Study

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ABSTRACT

Introduction: Diabetes mellitus (DM) is one of the commonest non communicable disease worldwide as well as in India. However, type 2 DM is more prevalent in urban area (11%) in comparison of rural area (9%) of India. Increased infections during DM have been found associated. Cellular immunity is decreased in DM due decreased functioning of agranulocytes.

Material & Methods: This was a retrospective type of study conducted in the department of medicine of tertiary care institutes during the period of March 2015 to February 2017. Present study included Nine hundred forty eight type 2 DM patients admitted in the institute during the study period. Among them two hundred sixty six patients (28.28 %) were suffering from various infections therefore these patients were included in the study.

Results: Finding of the present study revealed that infection in DM patients was associated with age, gender and socioeconomic status. Moreover, it was also found related to the type of treatment DM patients were using. Further, results showed that hypertension (60.9%) was the most common co-morbidity found in DM patients with infections. After hypertension most common co-morbidities were cardiovascular diseases (57.6%) and pulmonary diseases (27.8%).

Conclusion: Finding of the current study suggest that infections are more common in type 2 DM patients with poor glycaemic control. Moreover, Population type 2 DM patients with poor hygienic conditions and lower socio-economic group is more susceptible to the infections.

Keywords: Diabetes mellitus, Infection, Prevention.

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INTRODUCTION

Diabetes mellitus (DM) is one of the commonest non communicable disease worldwide as well as in India. However, type 2 DM is more prevalent in urban area (11%) in comparison of rural area (9%) of India.¹ secondary infections leads to increased morbidity and mortality in patients suffering with DM.² Increased infections during DM have been found associated with defective functioning of neutrophils, lymphocytes and monocytes along with decrease level of leucotriene B₄, prostaglandin E and thromboxane B₂.³⁻⁶ Cellular immunity is decreased in DM due decreased functioning of agranulocytes.^{7,8} Cellular immunity is improved with Improve glycaemic control in DM.⁹ Therefore, the present study was design to explore the causes, types and differentiating the age group of DM suffering with infections.

MATERIALS AND METHODS

This was a retrospective type of study conducted in the department of medicine of tertiary care institutes during the period of March 2015 to February 2017. Present study included Nine hundred forty eight type 2 DM patients admitted in the institute

during the study period. Among them two hundred sixty six patients (28.28 %) were suffering from various infections therefore these patients were included in the study. Rest six hundred eighty two type 2 DM patients were excluded. All records of DM patients were investigated to establish clinical profile and nature of infections. Kuppaswamy's classification was used to classify the socioeconomic status of the DM patients with infections.

Data Analysis

Results of the present study were analysed by using appropriate statistical tool.

RESULTS

Results of the present study showed two hundred sixty six patients (28.28 %) out of nine hundred forty eight patients of DM. Results are distributed under the following headings:

1. On the Basis of Age Groups:

Table 1 shows distribution of DM among different age groups. It is evident from table 1 maximum number of infection cases were found in above 50 years of DM patients (49.6%).

2. On the Basis of Gender:

Infections were more common in males compare to females.

3. On the Basis of Socio-Economic Status:

Finding of the present study revealed that maximum number of DM patients with infection belong to upper lower social economic status. (Table 3)

4. On the Basis of Duration of DM:

Data presented in table 4 shows that maximum number of cases of infection belongs to 11 to 15 years duration of diabetes.

5. On the Basis of Type of Treatment:

Results of the present study shows that maximum number of patients was on oral antibiotics (59%) compare to the patients on

insulin (16.54) whereas 22% of patients were on antibiotics and insulin. (Table 5)

6. On the Basis of Co Morbidities:

Table 6 shows that hypertension (60.9%) was the most common co-morbidity found in DM patients with infections. After hypertension most common co-morbidities were cardiovascular diseases (57.6%) and pulmonary diseases (27.8%).

7. On the Basis of Types of Infections:

Upper respiratory tract infections (29.3%), lower respiratory tract infection (16.5%) and urinary tract infection (26.6%) were more common in patients of DM. Followed by tuberculosis, skin and foot infections. (Table7).

Table 1: Age distribution

Age groups (years)	Number of diabetics with infection(n=266)	Percentage (%)
30-40	36	13.53
41-50	66	24.81
51-60	132	49.6
61-70	14	5.2
>70	8	3

Table 2: Sex distribution

Gender of total diabetic patients with infections	Number of diabetics with infection(n=266)	Percentage (%)
Males	172	64.66
Females	94	35.44

Table 3: Socio-economic status

Socioeconomic Status	Number of diabetics with infection(n=266)	Percentage (%)
Upper	16	6
Upper Middle	37	13.9
Lower Middle	26	9.7
Upper Lower	145	54.5
Lower	52	19.54

Table 4: Duration of diabetes

Duration of diabetes in years	Number of diabetics with infection(n=266)	Percentage (%)
<1	8	3
1-5	15	5.6
6-10	34	12.7
11-15	107	40.02
16-20	49	18.4
>20	53	19.9

Table 5: Type of treatment

Type of treatment	Number of diabetics with infection(n=266)	Percentage (%)
▪ Diabetes controlled with diet only	6	2.25
▪ Oral antidiabetic drugs	157	59
▪ Insulin treatment	44	16.54
▪ Oral antidiabetic drugs and insulin treatment	59	22

Table 6: Co morbidities

Co morbidities	Number of diabetics with infection(n=266)	Percentage (%)
Hypertension	162	60.9
Cardiovascular diseases	153	57.5
Pulmonary diseases	74	27.8
Psychiatric diseases	5	1.87
Thyroid	23	8.64
Urinary Incontinence	37	13.9
Neurological diseases	18	6.76
Renal diseases	27	10.15
Hepatic diseases	21	7.89
Malignancy	6	2.25

Table 7: Types of infections

Co morbidities	Number of diabetics with infection(n=266)	Percentage (%)
Upper respiratory tract infections	78	29.3
Lower respiratory tract infections	44	16.5
Urinary tract infection	71	26.6
Tuberculosis	31	11.6
Skin and soft tissue infection	30	11.2
Foot infection	20	7.51
Pyrexia of unknown origin	22	8.27
Acute gastroenteritis	12	4.51
Cholecystitis	11	4.13
Miscellaneous	6	2.25

DISCUSSION

Prevalence of infections are more common in type 2 DM patients in comparison of non-diabetic patients.¹¹⁻¹³ Type 2 DM influenced various functions of leucocytes including phagocytosis, immunity, chemotaxis etc. Timely diagnosis, urgent and effective medication should be modus operandi for the treatment of infections in type 2 DM patients.^{3,4,14} Infections of type 2 DM are more common in developing countries like India in comparison of developed countries.¹⁵ Results of the present study showed that 266 DM patients (28.05%) out of 948 DM patients were suffering with infections. Moreover, Incidence of infections were more common in the age group of above 50 years which is consistent with the findings of Gillani et al¹⁶ as they observed prevalence of infection increased in DM patients with age. Current study revealed that infections were more common in male DM patients compare to female DM patients. These findings are very similar to the findings of the previous study of Young BA et al¹⁹ and Lavery LA et al²⁰ as they observed development of infection was more common in males.

Further, results of the present study showed that 74.4% of patients belong to lower socio-economic status. Oladele CRW et al,¹⁷ and Bachmann MO et al¹⁸ suggested incidents of infection during DM are more in poor hygienic conditions. Moreover, risk of poor health increase with low excess to health care. In addition, rate of infection is increased as the duration of DM increases.²¹ Every 10 years increase of DM duration leads to 1.9 fold increase

of urinary tract infections.²² Similar findings were observed in the current study. However, improve control of sugar level via oral medicines or insulin therapy may decrease the risk of infections in DM patients.²³ Similarly, infections were more prevalent in oral antibiotic drugs and poorly glycaemic controlled patients while infections were less common in better glycaemic control via insulin therapy (16.4%) in the present study.

Furthermore, results of the present study revealed that cardiovascular diseases and hypertension were the most common disease with which patients were suffering along with diabetes. Both of these co-morbidities are predisposing factor for infection cannot be concluded from these findings as no control group was included in the study.

CONCLUSION

Finding of the current study suggest that infections are more common in type 2 DM patients with poor glycaemic control. Moreover, Population type 2 DM patients with poor hygienic conditions and lower socio-economic group is more susceptible to the infections. Therefore, we emphasise that type 2 DM patients should be educated to improve their glycaemic control as well as hygienic conditions to prevent the risk of aforesaid infections in DM patients. However, more studies on larger population are warranted to establish a proper guideline for type 2 DM patients to avoid infection.

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