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**Original research article**

# Clinical profile of patients with diabetes mellitus attending tertiary care hospital

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**Abstract**

Half of people with diabetes don't know they have it and 4 out of 5 people with diabetes live in low- and middle-income countries. Half of people who die from diabetes are under the age of 60. Approximately 5.1 million people aged between 21 and 79 years died from diabetes in 2013 accounting for 8.4% of global all-cause mortality in this age group. 83 male patients of age 35-70 years attending Medicine OPD or admitted and as diagnosed cases of T2DM according to American Diabetes Association, 2014 guidelines would constitute the study population. The mean HbA1c in T2DM with low Te was 6.81±0.44% compared to 6.5±0.47% in normal Te group and the difference between the two was statistically significant CI 95%, t=3.0724, df=81 with P value =0.0029. Serum cholesterol, triglycerides, LDL and VLDL were found to be slightly higher and serum HDL to be lower in the low Te subjects but none of this difference was statistically significant.

**Keywords:** Diabetes mellitus, hba1c, serum cholesterol

## Introduction

Diabetes mellitus refers to a group of common metabolic disorders that share the common phenotype of hyperglycemia. Several distinct types of DM exist and are caused by a complex interaction of genetics and environmental factors. Depending on the etiology of the DM, factors contributing to hyperglycemia include reduced insulin secretion, decreased glucose utilization, and increased glucose production[1].

The metabolic dysregulation associated with DM causes secondary patho-physiologic changes in multiple organ systems that impose a tremendous burden on the individual with diabetes and on the health care system.

Globally, an estimated 422 million adults are living with diabetes mellitus, according to the latest 2016 data from the World Health Organization (WHO) Diabetes prevalence is increasing rapidly; previous 2013 estimates from the International Diabetes Federation put the number at 381 million people having diabetes.The number is projected to almost double by 2030.Type 2 diabetes makes up about 85-90% of all cases. Increase in the overall diabetes prevalence rates largely reflect an increase in risk factors for type 2, notably greater longevity and being overweight or obese[2].

Half of people with diabetes don't know they have it and 4 out of 5 people with diabetes live in low- and middle-income countries. Half of people who die from diabetes are under the age of 60. Approximately 5.1 million people aged between 21 and 79 years died from diabetes in 2013 accounting for 8.4% of global all-cause mortality in this age group. The global health expenditure to treat diabetes and its complications amounted to 548 billion USD in 2013[3].

Although the prevalence of both T1DM and T2DM is increasing worldwide, the prevalence of T2DM is rising much more rapidly because of increasing obesity and reduced activity levels as countries become more industrialized. This is true in most countries, and 5 of the top 10 countries (China, India, USA, Brazil, Russia, Mexico, Indonesia, Egypt, Japan, Pakistan) with the highest rates are in Asia.[12] The number of people with diabetes is increasing due to population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity[4].

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The prevalence is similar in men and women throughout most age ranges (10.5% and 8.8% in individuals >20 years) but is slightly greater in men >60 years.In developing countries, the majority of adults with diabetes are between 45 and 64 years old, whereas in developed countries the majority of adults with diabetes are 65 years and older[5].

The IDF (International Diabetes Federation) estimates that 23 million years of life are lost to disability and reduced quality of life as a result of complications associated with diabetes[6].

**Methodology**

**Inclusion criteria**

1. Male patients attending Medicine OPD in the age group 35-75 years.
2. Patients who are willing to give informed consent.

**Exclusion criteria**

1. Type 1 Diabetes.
2. On hormone replacement therapy, steroids or testosterone use.
3. Chronic renal or hepatic disease.
4. HIV infection.
5. Surgically uncorrected cryptorchidism.
6. Malignancy and use of cancer chemotherapeutic agents or radiation therapy.
7. Prior infectious orchitis.
8. Surgical orchiectomy.

**Case selection**

83 male patients of age 35-70 years attending Medicine OPD or admitted and as diagnosed cases of T2DM according to American Diabetes Association, 2014 guidelines would constitute the study population.

**Control selection**

85 age and BMI matched normal non-diabetic healthy male volunteersattending for blood donation in blood bank would serve as control group.

**Study Design**

A hospital based Observational cross sectional study.

**Results**

**Table 1:** HbA1c in cases

| HbA1c | Low Te | Normal Te |
|---|---|---|
| Mean | 6.81 | 6.5 |
| SD | 0.44 | 0.47 |

The mean HbA1c in T2DM with low Te was 6.81±0.44% compared to 6.5±0.47% in normal Te group and the difference between the two was statistically significant CI 95%, t=3.0724, df=81 with P value =0.0029.

**Table 2:** FBS in cases

| FBS mg% | Low Te | Normal Te |
|---|---|---|
| Mean | 189.61 | 168.17 |
| SD | 68.2 | 49.63 |

The mean FBS in T2DM with low Te was 189.61±68.2 mg% compared to 168.17±49.63 mg% in normal Te group and the difference between the two was not statistically significant CI 95%, t=1.6564, df=81 with P value =0.1015.

**Table 3:** PPBS in cases

| PPBS | Low Te | Normal Te |
|---|---|---|
| Mean | 278.3 | 258.65 |
| SD | 104.77 | 63.78 |

The mean PPBS in T2DM with low Te was higher (278.3±104.77 mg%) compared to (258.65±63.78 mg%) normal Te group but the difference between the two was not statistically significant CI 95%, t=1.0532, df=81 with P value = 0.2954.

**Table 4:**Lipid profile levels and Te

| Lipid Profile (mg%) | Low Te (Mean±SD) | Normal Te (Mean±SD) | P value |
|---|---|---|---|
| Triglycerides | 155.58±45.22 | 152.25±33.95 | 0.7026 |
| Cholesterol | 191.19±33.44 | 178.53 ±36.08 | 0.104 |

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| | | | |
|---|---|---|---|
| LDL | 110.76 ±27.38 | 109.98±26.89 | 0.8967 |
| HDL | 48.28±8.05 | 49.44 ±8.75 | 0.5357 |
| VLDL | 28.09±11.05 | 25.58 ±8.84 | 0.2535 |

Serum cholesterol, triglycerides, LDL and VLDL were found to be slightly higher and serum HDL to be lower in the low Te subjects but none of this difference was statistically significant.

**Discussion**

In newly diagnosed T2DM with low Te the mean HbA1c was higher as compared to normal Te group and this was statistically significant. The bidirectional relationship between Te and insulin resistance likely affects this finding and the severity of symptoms is a factor of the duration of disease process. No significant association was found between FBS, PPBS and Te in cases which were consistent with findings of Umoh*et al.*[7] Kapoor *et al.*[8]orchitis in their study also had reported that Te was significantly associated with HbA1c values.

There was no significant difference in the parameters of lipid profile among low Te and normal Te group in our study although the mean values of LDL, VLDL, triglycerides and cholesterol were higher in the low Te group. Also the mean values of HDL were lower in the low Te group but this finding was not significant. Umoh*et al.*[7]reported that HDL was the only lipid related with Te. In their study HDL showed inverse correlations with Te which were significant in male individuals with MS and T2DM but not in controls ($p$<0.05). Reports of Malkin, *et al.*[9]in Hypogonadism men with T2DM showed that Te correlated negatively with total cholesterol, but had no effect on other components of the lipid profile while Van Pottelbergh *et al.*[10]Stanworth*et al.*[11]in their work found a positive association between LDL-C and Te. Grossman *et al.*[12]also reported elevated triglycerides and reduced HDL cholesterol levels among HypogonadismT2DM. It is possible that reduced pituitary and gonadal function could reduce gonadotrophins and ACTH which ultimately results in reduced clearance and accumulation of HDL with low Te synthesis.

**Conclusion**

- The mean HbA1c in T2DM with low Te was 6.81±0.44% compared to 6.5±0.47% in normal Te group and the difference between the two was statistically significant (P value =0.0029).
- The mean FBS in T2DM with low Te was 189.61±68.2 mg% compared to 168.17±49.63 mg% in normal Te group and the difference between the two was not statistically significant (P value =0.1015). Likewise the mean PPBS in T2DM with low Te was higher (278.3±104.77 mg%) compared to (258.65±63.78 mg%) normal Te group but the difference between the two was not statistically significant again (P value = 0.2954).
- Serum cholesterol, triglycerides, LDL and VLDL were found to be higher and serum HDL to be lower in the low Te cases but none of this difference was statistically significant.

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