

# Prevalence of diabetes mellitus among patients visiting medical outpatient department of Ayder referral hospital, Mekelle, Ethiopia: A three years pooled data.

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## Abstract

**Introduction:** The number of people suffering from DM is increasing due to population growth, aging, urbanization, low physical activity and socioeconomic growth. Quantifying the prevalence of DM and the number of people affected by diabetes, now and in the future, is crucial for planning prevention strategies and allocation of resources.

**Objective:** the purpose of this study was to determine the prevalence of diabetes mellitus in Ayder referral hospital.

**Method:** Hospital based retrospective record review was employed on 20,939 outpatients. Data was collected from the medical OPD log book using a structured questionnaire. The collected raw data was entered in to excel sheet, cleaned and then exported to SPSS version 19 and analyzed using appropriate statistical tools.

**Result:** The study revealed that 263 out of the total 20,939 outpatients were found to have diabetes mellitus, indicating an overall prevalence of 1.3%. Among the total 263 diabetes mellitus patients, 113 (43%) were males and 150 (57%) were females. Most of the patients, 216/263 (82%), had type 2 diabetes mellitus while 47/263 (18%) of them suffered from type 1 diabetes. 158/263 (60%) had BMI of 25 and above and 36/263 (14%) had family history of diabetes mellitus. Regarding their residence; great majority, 213 (81%) were urban dwellers as compared to 50(19%) from the rural areas.

**Conclusion:** Though the 1.3% prevalence of diabetes mellitus observed in this study is lower than the national estimate, still it indicates a considerable burden in the locality.

**Key Words:** Diabetes mellitus, Medical OPD, BMI

## Introduction

Diabetes Mellitus is a clinical syndrome comprising a heterogeneous group of metabolic diseases that are characterized by chronic hyperglycaemia and disturbances in carbohydrate, fat and protein metabolism secondary to defects in insulin secretion, insulin action or both. The three most common forms of diabetes are type 1 diabetes, type 2 diabetes and gestational diabetes [1, 2].

Diabetes is a serious condition in itself, but it should also be considered as a risk factor for other conditions including, cause of blindness, a leading cause of non-traumatic lower limb amputations, closely related with cardiovascular disease which is a major cause of diabetes related deaths (2-4 times more common in patients with diabetes mellitus than in the general population), associated with an increased risk of cerebro-vascular accidents and reduced life expectancy by as much as 5-10 years in middle aged patients [3,4].

Globally, diabetes mellitus is emerging as one of the most common chronic illnesses with an estimated number of 220 million people in 2010. Of these, approximately 12.1 million were living in Africa [5].

The burden of diabetes and diabetic related mortality and disability are rising in Africa. Increasing sedentary lifestyle, coupled with rapidly growing urban culture and modified diets, are predicted to triple the prevalence of diabetes mellitus in the next 25 years [6-8].

Ethiopia is the second most populous country in sub saharan Africa where more than 80% of the population lives in the countryside. The country experiences a heavy burden of disease mainly attributed to communicable

infectious diseases and nutritional deficiencies. Currently, it is also challenged by the growing magnitude of chronic non communicable diseases. In Ethiopia, national data on prevalence and incidence of diabetes are lacking [9]. However, patient attendance rates and medical admissions in major hospitals are rising. The estimated prevalence of DM in adult population of Ethiopia is 1.9% [10]. Coming to the study area i.e. Tigray regional state has no data on prevalence and incidence of diabetes mellitus like the nationwide. So the main purpose of this study was to determine the prevalence of diabetes mellitus on patients visiting Ayder Referral hospital in the years 2012-2014.

## **Methodology**

### **Study design and study subjects**

To study the prevalence of diabetes mellitus in patients attending Ayder referral hospital, a three years retrospective record review (2012-2014) of medical OPD logbook was conducted. The variables included in the data collection questionnaire were patient identification card, age, sex, marital status, income, level of education, occupation, religion, body mass index (BMI), family history of diabetes mellitus and ethnicity.

### **Criteria for the Diagnosis of Diabetes Mellitus**

- Symptoms of diabetes plus fasting blood glucose concentration >126 mg/dL or
- random blood glucose >200 mg/dL or
- Two-hour blood glucose > 200 mg/dL during an oral glucose tolerance test.

### **Quality assurance**

To ensure the quality of data, structured questionnaire was prepared by referring previous studies. Then, the required data was collected from the log book by considering carefully all the variables stated in the questionnaire with due attention to avoid any redundancy of the study subjects. Completeness of the data was asserted through periodic supervision of data collectors. Finally data was analyzed employing appropriate statistical treatment following proper entry and cleaning.

### **Statistical analysis**

Data was entered in to excel sheet, cleaned, exported to and analyzed using SPSS version 19. Descriptive summary of the study participants was presented in terms of frequency, range and proportions.

### **Ethical consideration**

Ethical clearance was secured from the research and community service office of the College of Health Sciences, Mekelle University. Following that cooperation letter was written to Ayder referral hospital. Thus, the study was commenced after obtaining permission from the hospital management. In addition, the whole objective of the study was briefly explained to the hospital authorities as well as for those working in the medical outpatient department of the hospital, so that we got permission. Moreover, confidentiality was strictly maintained throughout the study period.

## **Result**

To study the prevalence of diabetes mellitus, a retrospective record review of medical OPD log book was conducted for a total of 20,939 study subjects who attended Ayder referral hospital in the years 2012-2014. As indicated in table 1; 8,584 (41%) of the study subjects were male and 12,355 (59%) were female. Looking for their age distribution 5,862 (28%), 2,303 (11%), 4,187 (20%), 2,931 (14%) and 5,656 (27%) were in the age group of 15-25, 26-35, 36-45, 46-60, and 61-80 years respectively. Out of the total study participants, 263 (1.3%) had DM. Out of those 47 (18%) had type 1 DM and 216 (82%) had type 2 DM (figure 1).

Table1. Socio-demographic characteristics of study participants in Ayder referral hospital from 2012-2014, Tigray, Ethiopia (n=20,939).

| Variables          | Responses           | Frequencies | Percentages |
|--------------------|---------------------|-------------|-------------|
| Sex                | Male                | 8584        | 41          |
|                    | Female              | 12355       | 59          |
| Age                | 15-25               | 5862        | 28          |
|                    | 26-35               | 2303        | 11          |
|                    | 36-45               | 4187        | 20          |
|                    | 46-60               | 2931        | 14          |
|                    | 61-80               | 5656        | 27          |
| Marital status     | Single              | 8166        | 39          |
|                    | Currently married   | 7747        | 37          |
|                    | Separated           | 3978        | 19          |
|                    | Divorced            | 628         | 3           |
|                    | Widowed             | 420         | 2           |
| Residence          | Urban               | 3978        | 19          |
|                    | Rural               | 16961       | 81          |
| Level of Education | Illiterate          | 12772       | 61          |
|                    | Primary             | 4399        | 21          |
|                    | Secondary           | 2303        | 11          |
|                    | Higher education    | 1465        | 7           |
| Religion           | Orthodox            | 18007       | 86          |
|                    | Muslim              | 2932        | 14          |
| Occupation         | Government employee | 5445        | 26          |
|                    | Self employee       | 7328        | 35          |
|                    | Farmer              | 8166        | 39          |
| Ethnicity          | Tigraway            | 19682       | 94          |
|                    | Amharay             | 1257        | 6           |

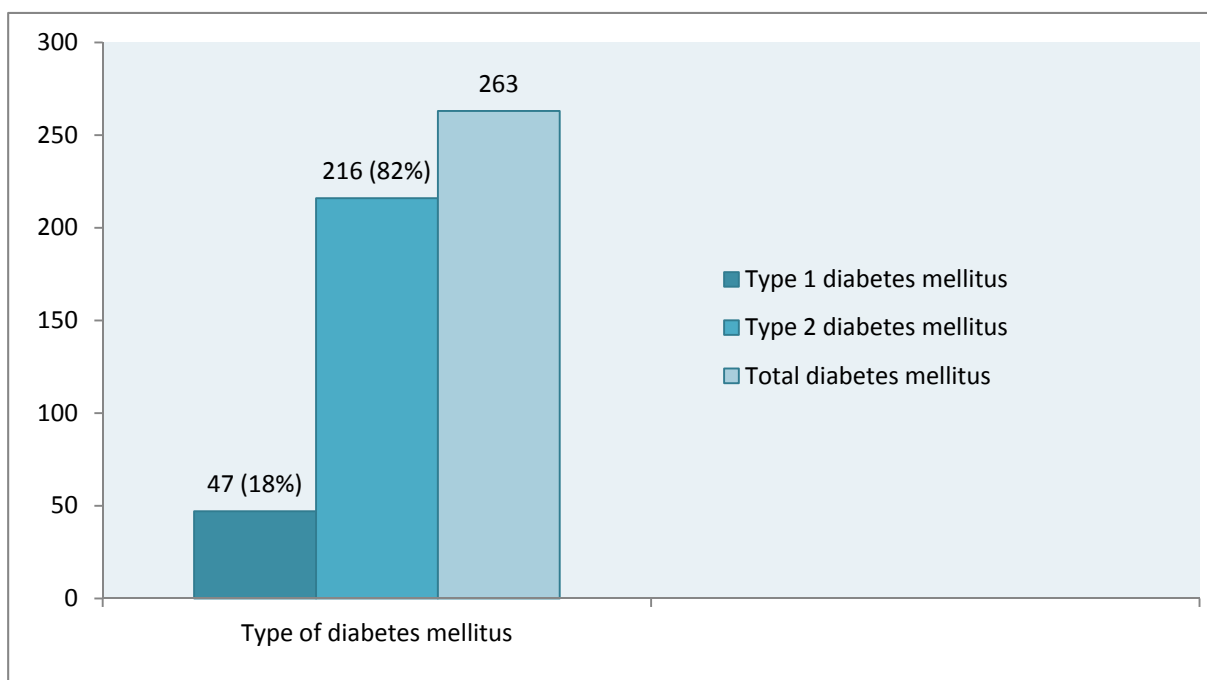


Figure 1: Type and proportion of diabetes mellitus in patients attended Ayder referral hospital

Among the total 263 diabetes mellitus patients, 113 (43%) were males and 150 (57%) were females. 102 (39%) were single, 97(37%) were currently married, 51(19%) were separated, 7(3%) were divorced and 6 (2%) were widowed. 158 (60%) had BMI of 25 and above and 36 (14%) had family history of diabetes mellitus. Regarding their residence; great majority, 213 (81%) were urban dwellers and 50 (19%) were rural dwellers.

### Discussion

The study was intended to determine the proportion of diabetes mellitus in patients visiting the medical OPD of Ayder referral hospital in years September 2012 to August 2014. This study has showed that the proportion of DM is 1.3%. Our finding was lower than the national prevalence in Ethiopia, 1.9% [10]. Similarly it is also lower than the African region prevalence which was estimated as 4.9% [11]. This variation might be due to differences in socio-economic status and overall lifestyle of the patients studied i.e. DM affects people with high economic status and those with sedentary activity among others.

In the current study, out of the total 263 diabetic patients, 47(18%) had type 1 DM and 216 (82%) had type 2 DM. World health organization (WHO) estimated that in 2000, the prevalence of diabetes in African Region was 7.02 million people, out of which about 0.702 million (10%) people had type 1 diabetes and 6.318 million (90%) had type 2 diabetes [12]. The reason behind the rise in prevalence of DM with type 2 may be due to a change in feeding and overall lifestyle emanating from increasing urbanization and economic development in the region.

Regarding residence, 213 (82%) of the total diabetic patients in this study were urban dwellers while 50 (18%) of them were living in rural areas. This is in agreement with Iranian study that reported the prevalence of DM in urban areas was more than rural, 10.4% versus 6.4% [13]. This may due to differences in lifestyle and economic status between the residents of urban and rural area.

Concerning educational level, out of the total 263 diabetic patients, 23 (8.7%), 40 (15.2%), 103 (39.2%) and 97 (36.9%) were illiterate, primary level educated, secondary level educated and tertiary level educated, respectively. The finding of the current study is contradictory to the Iranian study that reported DM was significantly observed in illiterate people, more so than in other educated groups ( $P = 0.004$ ) [13]. Though academic and job related stresses serving as a predisposing factors may possibly reason out for the higher prevalence of diabetes mellitus among those educated in our study; this has to be confirmed by future prospective studies.

### Conclusion

Though the 1.3% prevalence of diabetes mellitus observed in this study is lower than the national estimate, still it indicates a considerable burden in the locality.

### Competing interest

There is no conflict of interest with regard to this research article.

### Author's contribution

YA, SK, RT, LT GG, AM, HA designed the study, YA, SK, RT, LT engaged in data collection, HA, GK, AM involved in data entry, cleaning, analysis and interpretation. HA drafted the manuscript and all authors reviewed and approve the final manuscript.

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