

The prevalence of type 2 diabetes mellitus and impaired fasting glucose in semi-urban population of Nepal

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ABSTRACT

The increase in life expectancy in developing countries and as a result of increasing obesity and other life style changes, the global incidence of type2 diabetes mellitus (T2DM) is increasing. The purpose of this study was to investigate the prevalence of T2DM and impaired fasting glucose (IFG) in semi-urban population of Nepal and to compare the prevalence between men and women and among different age groups. A total 740 adults (286 men and 454 women) aged 21 to 94 years (men \pm SD; 45.6 \pm 15.6 years) were included. The prevalence of T2DM and IFG was 9.5% and 19.2% in the whole population. Prevalence of T2DM was higher in men (11.8%) than in women (7.9%), similarly IFG was noted higher in men (25%) than in women (15.4%). The prevalence of T2DM and IFG was seen to be increased with age in the whole population. Among women, the prevalence of T2DM and IFG was 2.9% and 12.8% in 21 to 40 years age group, 9.7% and 13.8% in 41 to 60 years age group and 15.4% and 27.7% in >60 years age group. Among men, it was 4.7% and 22.6% in 21 to 40 years age group, 13.3% and 30.5% in 41 to 60 years age group and 23% and 17.3% in >60 years age group. To conclude, the overall prevalence of T2DM and IFG increases with age. Prevalence of IFG is highest among middle age men where as the prevalence of T2DM is highest among older men.

Keyword: Type2 diabetes mellitus, impaired fasting blood glucose, prevalence, Nepal.

INTRODUCTION

The global incidence and prevalence of diabetes mellitus is exploding. As a result of aging and changing life style, the prevalence of diabetes mellitus is rapidly increasing around the world. The world health organization (WHO) has projected that an estimated 300 million people will suffer from diabetes by the year 2025.¹ Diabetes mellitus is a chronic prevalent disease, which significantly increases morbidity and mortality. The increase in life-expectancy in developing countries and as a result of increasingly obese and decreasingly physically active population, the global incidence of diabetes mellitus is increasing^{2,3} and type-2-diabetes mellitus (T2DM) represents more than 90% of all cases of diabetes.

Recently, an increasing trend of T2DM in Nepal is reported.⁴ Assuming an increasing prevalence of T2DM, especially in urban population of Nepal, we analyzed the prevalence of T2DM and impaired fasting glucose (IFG) in semi-urban population of Nepal. Diagnostic criteria of T2DM and IFG

recommended by American Diabetes Association (ADA)⁵ and WHO (1999),⁶ was used to define the diagnosis of T2DM and IFG. The purpose of our survey was to reveal the prevalence of T2DM and IFG between men and women and among different age groups.

MATERIALS AND METHODS

For the purpose of this study, a cluster sampling method was used for sample collection in semi-urban areas in northern and southeastern part of Kathmandu Valley. Sample size was accumulated through different health camps. To encourage the local participation, free health camps were organized, with prior public notice. For the purpose of this study, participants were advised to attend fasting. Prior to the blood sample collection, purpose of the survey was explained and verbal consent was taken from each participants. Only adult participants aged \geq 21 years were included.

Blood sample was collected by venipuncture using disposable syringe and put into the plain tube and allowed to clot. The samples were then transported

Table-1: Prevalence of T2DM and IFG in different age-groups

Age (Yrs)	Total n	T2DM	IFG
21 - 40	278	3.6 %	16.5 %
41 - 60	345	11.0 %	20.0 %
> 60	117	18.8 %	25.6 %

T2DM was defined when fasting blood glucose (FBG) level was ≥ 126 mg / dl according to WHO 1999 criteria⁶ of diagnosis and classification of diabetes mellitus. Impaired fasting glucose (IFG) was defined when FBG level was 100 to 126 mg/ dl according to ADA recommendation.⁵ Fasting normal blood glucose was considered normal when the value was less than 100mg / dl.

The prevalence of T2DM was analyzed in the whole study population. Prevalence was also separately analyzed among men and women, and different age groups. Similarly, IFG was analyzed in the whole study population and separately among men and women, and different age groups as well.

RESULTS

A total of 740 adult participants were randomly selected from different free health camps. Age of participants ranged from 21 to 94 years with a mean \pm SD was 45.6 ± 15.6 years. Among 740 adults participants 286 were men and 454 were women. Seventy participants including 34 men and 36 women in total study population were noted with raised FBG level ≥ 126 mg/dl. So T2DM was detected in 9.5% of the whole study population. Among men the prevalence of T2DM was 11.8% whereas 7.9% was in women.

IFG was detected in 142 participants in the whole study population. Among 142 participants, 72 were men and 70 were women. The prevalence of IFG was 19.2% in the whole study population. When it

was separately analyzed in men and women, the prevalence of IFG was 25.0% and 15.4%, respectively.

When the prevalence of T2DM and IFG was analyzed among different age groups, the prevalence was highest in older population aged >60 years (Table-1). In older age group, the prevalence of T2DM was 18.8% and the prevalence of IFG was 25.6%. Similarly, the prevalence of T2DM and IFG was respectively 11.0% and 20.0% in 41 to 60 years age group. The prevalence was lowest (T2DM: 3.6% and IFG: 16.5%) in younger age group (21 to 40 years). The prevalence of T2DM was highest in both men (23.0%) and women (15.4%) in older age group (Table-2). Interestingly, the prevalence of IFG was found highest (30.5%) among 41 to 60 years followed by 22.6% in 21-40 years and 17.3% in >60 years age group males. However, among females, the prevalence of IFG was highest (17.7%) in >60 years, followed by 13.8% in 41 to 60 years and 12.8% in 21 to 40 years age groups (Table-2).

DISCUSSION

The prevalence of T2DM is increasing world wide due to change in life style and growing aging population. Over the next few decades, the greatest anticipated increase in diabetes mellitus will come from developing countries.¹ Increasing trend in the prevalence of T2DM was reported few years back in one hospital based study carried out at urban region of eastern Nepal.⁷ The report showed overall prevalence of T2DM 6.3% in study population, with a prevalence of 6.7% in men and 5.7% in women. These values were lower than present study. Similarly, the rapid increase in the prevalence of diabetes have also been reported by other investigators in Nepal.^{8,9}

Present study showed relatively higher prevalence of T2DM and IFG in comparison of previous

Table-2: Prevalence of T2DM and IFG in men and women among different age-groups

Age (Yrs)	Total n	T2DM	IFG
21 - 40	M: 106	4.7 %	22.6 %
	F: 172	2.9 %	12.8 %
41 - 60	M: 128	13.3 %	30.5 %
	F: 217	9.7 %	13.8 %
> 60	M: 52	23.0 %	17.3 %
	F: 65	15.4 %	27.7 %

Our study limits with relatively small number of study population. Samples were collected in different health camps rather than random sampling in a specified area. This may hinder the accurate calculation of prevalence of T2DM and IFG for a certain located area. Despite these limitations, samples were randomly collected in free health camps without knowing participants prior health status. Because of prior public notices and maximum participations of local inhabitants in different free health camps in different parts of the semi-urban area, this study indeed provides the prevalence of T2DM and IFG in semi-urban population of Nepal.

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