Research Article

Prevalence of Type 2 Diabetes Mellitus at Birat Medical College Teaching Hospital, Biratnagar, Nepal

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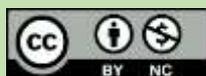Amar Kumar Sinha,
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Abstract

Type 2 DM (Diabetes Mellitus) is the common and rising on the world wide. The aim of this study is to determine the prevalence of Type 2 DM (Diabetes Mellitus) in eastern region of Nepal. The objectives of this study ware to find out the prevalence of type 2 Diabetes Mellitus in different age groups and gender i.e. male & females of eastern region of Nepal.

This was a hospital based retrospective study was carried out between the age group of 0-75 and 76 and above yrs during April 2015 to Feb.2016. Sample size 9,765 subjects who were attended outdoor patient department (OPD) and indoor patient department (IPD) investigated for estimation of blood glucose levels were selected. Family history of Type 2 DM (Diabetes Mellitus) was recorded by questioner. Blood Glucose estimation was performed by Glucose Oxidase Peroxidase (GOD/POD) enzymatic method used. Diagnostic criteria of Type 2 DM recommended by American Diabetes Association and WHO. Statistical analysis was done using Excel.

Total of 9,765 patients were included in the study. Among the total population 9,765 found1, 195 patients elevated cases in which 829/5,612 were males and 366/4,153 were females. The highest prevalence of type 2 diabetes 47.03% in the age group of 26-50 yrs and the second highest was 44.77% in 51-75 yrs age group. Male were found to be higher 69.4% in all the age groups than females 30.6%. Out of 1,195 diabetic patients, 27.20% have family history of Type 2 DM (Diabetes Mellitus).

It has been observed that Type 2 DM is the most common among the age group of 26-50 yrs. It is also evident that the higher prevalence group was found to be males than female's. Recently it was found that the prevalence of Type 2 DM (Diabetes Mellitus) was increasing which could be due to ignorance of the problems and poor medical service in the country.

Keywords: Prevalence; Type 2 DM (Diabetes Mellitus); Eastern region

Introduction

Type 2 diabetes in adults is more common and increasingly affects children. There's no cure for type 2 diabetes, but may be able to manage the condition by eating well, exercising and maintaining a healthy weight. If diet and exercise aren't enough to manage blood sugar well, also may need diabetes medications or insulin therapy. The world health organisation (WHO) has projected that an estimated 300 million people will suffer diabetes by the year 2025 (King *et al*., 1998).

Past three decades, the number of people with Diabetes mellitus has quadrupled. In the worldwide about 1 in 11

adults have diabetes mellitus, 90% of whom have Type 2 diabetes mellitus. More than half of all Diabetes cases in developing nation's cases go undiagnosed. Asia is a major area of the rapidly emerging Type 2 Diabetes mellitus global epidemic, with China and India the top two epicentres. The role of insulin is to facilitate movement of sugar (Glucose) from the blood stream in to the body's cells, where it is used for energy. With the help of insulin excess amount of glucose store in the liver.

Type 2 diabetes goes untreated; hyperglycemias damage the body's blood vessels and can lead to many complications that can affect nearly every organ in the body. Recently, an increasing trend of type 2 diabetes in Nepal is reported (Shrestha *et al*., 2006). The incidence of type 2 DM is highest in economically developed countries, particularly in the US. Type 2 DM (Diabetes Mellitus) accounts for about 90-95% of all diagnosed cases of diabetes. Clinically based reports and regional studies suggests that type 2 DM (Singh and Bhattarai, 2003; NDIC, 2005). Diabetes Mellitus) in children and adolescents, although still rare is being diagnosed more frequently, particularly in Americans (Singh and Bhattarai, 2003; NDIC, 2005). In Nepal, e.g., diabetes is an endemic disease and is bringing new challenges in connection with rapid urbanization and modernization (Subedi *et al*., 2005). As the population ages, it is expected that prevalence of chronic diseases such as diabetes and hypertension will rise sharply (Moopil *et al*., 2006).

In 2012, diabetes caused an estimated 1.5 million deaths. More than eight of every ten of them occurred in low and middle income countries. WHO anticipates that worldwide death from diabetes will double by 2030.

WHO estimates that of people with diabetes die of cardiovascular diseases, such as heart disease and stroke. The American diabetes association reports that >71% of US adults with diabetes had hypertension or used medication to treat hypertension.

Material and Methods

The hospital based retrospective study was carried out in the Birat Medical College teaching hospital. The patients for health checkup who attended the outdoor patient department (OPD) and Indoor patient department (IPD) during April2015 to Feb. 2016 were included in the present study. A sample size 9,765 subjects who were investigated for estimation of blood glucose levels were selected, including both sexes. Family (history of type 2 DM (Diabetes Mellitus) were recorded by questioner. The purpose of our survey was to reveal the prevalence of Type 2 DM between male and females among different age groups.

The patients were categorised in the different age group wise i.e. 0-25, 26-50, 51-75 and 76 and above yrs respectively. Blood sample were collected in collection centre unit of BMCTH, under the supervision care of Clinical Biochemistry lab and Blood Glucose estimation were performed by Glucose Oxidase Peroxidase (GOD/POD) enzymatic method using auto analyzer (Auto pack System AS-1)Diagnostic criteria of Type 2 DM recommended by American Diabetes Association (ADA) (ADA, 2004), and WHO (1999) was used to define the diagnosis of Type 2 DM (Diabetes Mellitus).Type 2 DM(Diabetes Mellitus) was defined when fasting blood glucose (FBG) level was e"126mg/dl according to WHO 1999 criteria (WHO, 1999) for diagnosis and classification of DM (Diabetes Mellitus). Impaired fasting glucose (IFG) level was 100-126mg/dl according to American Diabetes Association (ADA) (ADA, 2004). Fasting normal blood glucose was considered normal when the value was <100 mg/dl.

Results

Table 1 **s**hows 9,765 patients were investigated (5,612 male & 4,153 female). Type 2 DM (Diabetes Mellitus) level found elevated in 1,155 and 8,532 found within normal range among the total population 9,765. In 1,195patients elevated cases in which 829/5,612 were male and 366/4,153 were females. Over all prevalence of Type 2 DM (Diabetes Mellitus) was 12.2% among the study population, the prevalence of male and female was 14.8% and 8.8% respectively.

Table 2 shows the distribution of male female patients according to different age groups among the diagnosed population. Maximum occurrence of Type 2 DM (Diabetes Mellitus) 562 (47.03%) belonged to 26-50 yrs age groups followed by 535(44.77%) patients 51-75 yrs age group and the lowest was 19 (2.09%) in 0-25 yrs age group. If comparative study of type 2 DM (Diabetes Mellitus) in male and females, males were found to be higher 829 (69.4%) in all the age group than females 366 (30.6%).

It is evident with the Fig. 1, the family history of Type 2 DM (Diabetes Mellitus) level were found elevated 72.80% with no history of DM (Diabetes Mellitus) and 27.80% with history of DM (Diabetes Mellitus) in family among total 1,155 Type 2 DM (Diabetes Mellitus) subjects.

Table 1: Prevalence of DM (Diabetes Mellitus) in different sex

Sex	Normal	Percent	Elevated	Percent	Total	Percent
Male	4783	85.2	829	14.8	5612	57.5
Female	3787	91.2	366	8.8	4153	42.5
Total	8570	87.8	1195	12.2	9765	100.0

Chi-square = 78.9, p-value <0.001

Table 2: Prevalence of DM (Diabetes Mellitus) in different age group and sex

Age Gr./yrs	Male	Percent	Female	Percent	Total	Percent
0-25	19	76.0	06	24.0	25	2.09
26-50	438	77.9	124	22.1	562	47.03
51-75	319	59.6	216	40.4	535	44.77
76 & Above	53	72.6	20	27.4	73	6.11
Total	829	69.4	366	30.6	1195	100.0

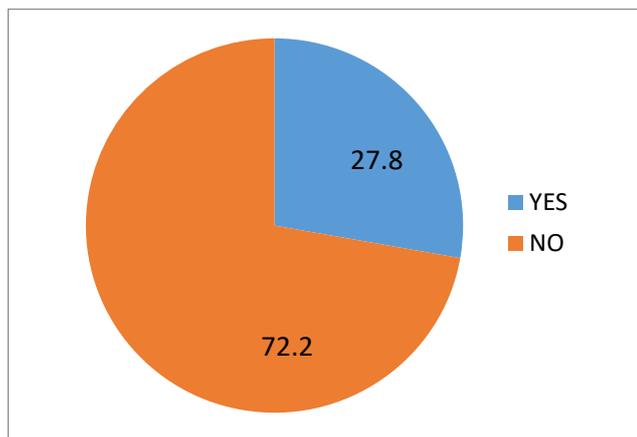Chi-square = 44.19, p-value < 0.001

Fig. 1: Family history of DM (Diabetic Mellitus)

Discussion

Our study is the hospital based and retrospective study. The prevalence of Type 2 DM (Diabetes Mellitus) was analyzed among the study population in male and females as well. Studied in urban region of eastern Nepal (Karki *et al*., 2000). The overall prevalence of Type 2 DM (Diabetes Mellitus) was 6.3% with the prevalence in males 6.7% and 5.7% in females. These values were lower than the present study. Among the investigated subjects 12.2% of the total population was diagnosed as Type 2 DM (Diabetes Mellitus) and rest were as non-diabetic. Fig1. The family history of Type 2 DM (Diabetes Mellitus) level were found elevated 72.80% with no history of DM (Diabetes Mellitus) and 27.80% with history of DM (Diabetes Mellitus) in family among total 1,155 Type 2 DM (Diabetes Mellitus) subjects. Further, as per record of our laboratory investigation in age wise distribution it was shown that 47.03% in the age group of 26-50 yrs, 44.77% age group 51-75 yrs. This is cleared that highest percentage of Type 2 DM (Diabetes Mellitus) was found in above 26 yrs age group. However, such incidence was occurred among the persons 30-50 yrs in the study in diabetes trends in US (Mokdad *et al*., 2000) and in other international trends (NDIC, 2005), it was above 40 yrs of age. But our study is still in support of the view of increasing percentage of Type 2 DM (Diabetes Mellitus) with age. Considering in respect with sex wise distribution among the positive cases, the highest percentage of Type 2 DM (Diabetes Mellitus) is occurred in males (14.8%) than females (8.8%). When we

compared to the percentage of Type 2 DM (Diabetes Mellitus) of international trends (Males-6.7% and females-5.75%) (Smelter and Bare, 1996).

On the other hand, our study could not classify Type 1 and 2 DM from the estimated Blood Sugar level of the persons without taking proper history and other Diabetic profiles. However, from the analysis of various studies (Smelter and Bare, 1996; Ramchandran *et al*., 1999; Zimmer, 1982). Type 2 DM is the most common form of diabetes,>95% of American and Indian population with Type 2 DM, prevalence in the world which was accounted for between 85-90% of all diabetes (NDIC, 2005; Zimmer, 1982). Nepal Government policies may help in creating guidelines on diabetes management, funding community programmes for public awareness about the diabetes risk reduction, availability of medicines and diagnostic services to all sections of community (Verma *et al*., 2012). Efforts by various governments and agencies around the world to intervene in diabetes management have resulted in positive health outcomes for their communities. In the United States there are number of public and private funded programmes to prevent and manage diabetes that have been successful (http://www.cdc.gov/diabetes/states/index.htm).

Physical inactivity are strong risk factors for Type 2 Diabetes and glucose intolerance (WHO, 1994). The health survey for England has demonstrated strong social class gradients and physical inactivity, particularly in women, with higher levels of physical inactivity in manual compared with non-manual social classes (Colhoun and Prescott-Clarke, 1996). However, in women these differences were not fully accounted for by differences in physical activity suggesting that other factors may also be important (Unwin *et al*., 1995). Those less consistently identified as markers for diabetes, include smoking (Rimm *et al*., 1995) and dietary constituents, such as amount of fat (Marshall *et al*., 1994); and antioxidant vitamins (Salonen *et al*., 1995). The strong association between low socioeconomic status. The increased prevalence of diabetes in men is unexplained but it is consistent with other studies (Williams *et al*. 1985). The most striking difference in diabetes prevalence is within the 26–75-year age bands for both men and women where there is a near doubling of diabetes prevalence in the most deprived quintile

Compared with the most affluent. Over the age of >50 years the association between socioeconomic status prevalence and diabetes became weaker. This could be the result of a survival effect with people with diabetes in lower socioeconomic groups dying prematurely as has recently been reported (Chaturvedi *et al*., 1998). In the USA, low income was associated with a higher prevalence of diabetes (Adams and Benson, 1990). In Israel the incidence of diabetes was inversely related to educational attainment (Medalie *et al*., 1974), a proxy for socioeconomic status.

This is hospital based retrospective study, in the community, the demographic distribution and other profile of diabetes may be influenced by socio-cultural factors. A community or age based study of diabetes mellitus should be implemented. Some time we cannot get the complete record of patients, which could have been to give important information to the patients with rapid industrial development and due to that hike in financial status possibility promotion of successful health and medical care programmes in Nepal.

Conclusion

It has been observed that Type 2 DM (Diabetes Mellitus) is the most common among the 26-75 yrs of age group and that the higher percentage group is found to be in males than females. Hence our study aims at an early diagnosis and proper treatment among the diabetic population by improving medical service in the community of Biratnagar, eastern region of Nepal for this reason we are expecting to implement a Diabetic Clinic in BMCTH in near future.

Conflict of Interest

The author declares that there is no conflict of interest with present publication.

Acknowledgement

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