RISK FACTORS ASSESSMENT OF TYPE 2 DIABETES MELLITUS IN ADULT MALE POPULATION OF HAYATABAD, PESHAWAR: A Cross-sectional Study

Aziza Alam¹, Saad Akbar², Ismail Alam Khan³, Rubeena Gul¹, Rozina Rehman⁴, Shaista Noreen⁴

ABSTRACT

Objective: To assess the risk factors of Type 2 Diabetes in adult male population of Hayatabad, Peshawar.

Methods: This study was a population based cross-sectional analysis of 400 male of age 40-70 years, using random sampling technique. Modified standard questionnaire (AUSDRISK) was used to find out the risk factors associated with Type 2 DM. Men of age 40 and above and willing to take part in the study were included and those individuals who had physical disability were excluded from the study.

Results: The risk of diabetes was low in 27% of individuals 29% intermediate and 44% high risk was found. Analysis showed that growing age, positive family history, waist circumference, hypertension, sedentary lifestyle were the risk factors for type II diabetes.

Conclusion: The results of present study shows that type II diabetes is a main health problem in Hayatabad, Peshawar and lifestyle modifications are required to control this problem.

KEY WORDS: Type II diabetes, AUSDRISK, Hypertension,

INTRODUCTION

Diabetes is a chronic disease having elevated levels of glucose in the blood(hyperglycemia) because of defect in insulin release action or both. Conditions accompanying persistent hyperglycemia are impairment, improper function, and malfunction of multiple organs predominantly the eyes, kidneys, nerves, heart and blood vessels.¹

Diabetes Mellitus (DM) is a global menace with several problems and growing frequencies despite incredible development in both basic and clinical medical sciences². Asian countries contribute to more than 60% of all the diabetic patients in the world and its prevalence is still rising at a very high rate³

1 Community Medicine Department Khyber Medical College, Peshawar

2 BS Biotechnology, MPhil, MPH IM Sciences, Peshawar

3 Department of Medical Education Rehman Dental College, Peshawar

4 MPhil Scholar Community Medicine department Khyber Medical college, Peshawar

Address for correspondence:

Dr. Aziza Alam Community Medicine Department Khyber Medical College, Peshawar azizagrc@yahoo.com

Diabetes Mellitus 2 contributes 80-90%⁴ of all cases of Diabetes Mellitus.It is triggered by amalgamation of inherited factors related to impaired insulin release, insulin resistance and environmental features which consist of obesity, excessive consumption of food, not exercising regularly, stress as well as growing old. Conditions such as hypertension and dyslipidemia are usually present in these individuals. Nearly all the symptoms of Type 1 and 2 DM are similar, but they differ in their extent and progress more quickly in type 1 diabetes and are more predictable. Several of the symptoms of Type 1 diabetes include reduction in weight, polyurea, excessive thirst, voracity, constipation fatigue, spasms, indistinct vision, and candidiasis. Individuals with type 1 DM become prone to small vessel complications and macrovascular diseases such as coronary artery, heart, and peripheral diseases.⁶

Most cases of Type 2 DM are diagnosed as incidental findings or because of complications. This type of diabetes carries excessive risk of macrovascular atherosclerosis usually linked to increase in blood pressure, elevated lipid levels and obesity. Cardiovascular complications and end stage nephrotic disease are the major causes of mortality among Type 2 DM patients⁷ The extent of complications and over all morbidity and mortality are related to geographical variation.⁵

In the latest 9th edition of international diabetes federation (IDF) about 463 million people are affected by DM and the number is projected to touch the figure of 700 million till 2045 mainly around 80% of burden will be observed in middleand low-income developing countries. The increase in the number of diabetic patients is 174% in South East Asia i.e. from 55 million to 153 million in 2019 where Pakistan is unfortunately listed on the top in the strata of adult age 20-79. According to IDF, in 2045 with 37.1 million effected people Pakistan will be the third with highest prevalence for diabetes.⁸ Beside genetic predisposition, however certain environmental factors are believed to be the major reason in deterioration of glucose tolerance leading to type 2 diabetes.

The rationale of the study was that new emerging nutritional trends like eating junk food or ready to eat meals along with physical inactivity is contributing to this public health menace.. It is clear that both obesity and physical inactivity are involved in increasing insulin resistance ultimately causing diabetes mellitus⁹. Therefore this study attempted to find the risk factors and frequency of type 2 diabetes in adult male population of Hayatabad, Peshawar as it is one of the major burden of disease worldwide.

Methodology

This was cross-sectional, descriptive study conducted in general population of Hayatabad, one of posh areas of Peshawar with population of 34,587. Study was conducted from September 2018 till November 2018. Sample size was calculated using WHO online sample size calculator which came to 332 based on 95% confidence interval. To increase the validity of results 400 samples were studied.

Multistage sampling was done in which 2 union councils out of 93 were chosen randomly. From each of the 4 areas 50 samples were collected. First person was selected at random and then every fifth person at public places i.e. markets, parks and bus stops etc. By asking the men there age, men of age 40 and above and willing to take part in the study were included. Those individuals who had physical disability were excluded from the study.The study was assessed and given approval by the Institutional Review Board of Khyber medical college.

Modified standard AUSDRISK questionnaire was used in Australia to assess the risk factors for diabetes mellitus in the general population. The respondents were asked about their age 2 points were given for 40-44 years, 4 points \leq 45 – 54 vears. 6 points \leq 55 – 64 vears and 8 points \leq 65 years or over, any type of diabetes in the parents or siblings, ever been found high blood glucose during illness, consuming medicines for high blood pressure, frequency of vegetable or fruit intake, physical activity per week all of these variables were given score of 0 points for No and 3 points for Yes. Waist measurements were done using a non stretchable measuring tape placed over the belly button. Less than 90 cm were given 0 points, 90 -100 cm= 4 points and more than 100 cm= 7 points were given. At the end all scores were added to predict 5 years risk of diabetes. Persons having a score of 5 or less will have minimum risk, \leq 6-11 score had Intermediate risk, scores of \leq 12 or more there is a high risk. Informed verbal consent was taken prior to data collection

Data was entered on daily basis in EXCEL (version 360) for descriptive statistics which was presented in form of frequency, percentages, text, graphically and in the form of table.

RESULTS

Thirty-seven per cent of the population (n=150) were between 40-50 years and 45% were 50-60 years and 18% were 60 years or older. Further 55 % of the total population reported that they performed physical activity and 65% reported they consumed fruits and vegetables (Fig 1)



Figure 1: Physical activity and Food consumption contributing to Diabetes of the study population

In majority of males did not have normal blood sugar and were not using any medication for hypertension see table 1.

| Variables | Present | Absent |
|-------------------------------------|-------------|-------------|
| Presence of Hyperglycemia | 37% (n=148) | 73% (n=252) |
| Use of medicine for Hypertension | 32 %(n=128) | 68% (n=272) |

Table 1: Frequency of Hyperglycemia and use of Hypertensive drugs in male age 40-70years

Waist circumference was used as a parameter for obesity. Enhanced risk in AUSDRISK begins at comparatively large waist circumference (102 cm for men)

| Waist Circumference | Frequency |
|---------------------|-----------|
| Less than 102 cm | 25% |
| 102 – 110 cm | 35% |
| More than 110 cm | 40% |

Table 2: Waist Circumference in the Respondents of general population

In our study 27% of the respondents fall in the category of low risk 29% in intermediate risk while 44% having high risk of Diabetes mellitus type 2(Table 3)

| Low risk | Intermediate risk | High Risk |
|-----------|-------------------|-----------|
| 106 (27%) | 117 (29%) | 177 (44%) |

Table 3: Risk of diabetes in Respondents of general population (n=400)

Risk of developing Type 2 DM was more in 50 years and above see Table 4 for details

| Age (years) | Low risk | Intermediate risk | High risk |
|---------------|----------|-------------------|-----------|
| 40-50 (n=150) | 56 | 57 | 37 |
| 50-60 (n=180) | 45 | 55 | 80 |
| 60-70 (n=70) | 5 | 5 | 60 |

Table 4 Risk of developing Diabetes in different age groups of study population

DISCUSSION

The present study was done to assess risk factors of Type 2diabetes mellitus in general male population belonging to 40 years and above in Hayatabad, Peshawar. In total of 400 participants, 47% of respondents were having positive family history of diabetes which is consistent to a study done in Bosnia and Herzegovina where positive family history and high blood sugar level were the main risk factors in 64% of 35-64 years old respondents. A much identified risk factor for Type II diabetes in the Asian populace is a positive history in first degree associations. Consanguinity is associated to genetic diabetes as consanguineous marriages are a frequent practice in our country which is contributing to this chronic disease¹⁰.

The risk of developing diabetes mellitus type 2, our study showed that 106 (26%) of participants had a low risk, 117 (29%) had an intermediate risk, 177 (44%) had a high risk of developing diabetes mellitus type 2; they are almost consistent with the 39.5% of respondents with a high risk in a study completed in South West Victoria using a same tool. The difference in Australian population having a high occurrence of the disease and a high occurrence of risk factors¹¹ is due to strict screening protocols used by them in contrast to Pakistan.

The reasons may be presence of other contributing factors like consuming different types and variety of fruits and vegetables or grains, level of physical activities, body mass index and presence of some other disease e.g. hypertension, asthma or usage of medication and working environment.^{12,13}

37% of respondents in our study were aware of their high glucose levels, while 32% were using drugs for hypertension. As high level of glucose, in the long run, leads to cardiovascular consequences and certain metabolic syndromes e.g. diabetes mellitus. Awareness and timely management is necessary to keep the prevalence low. 63% of respondents were identified as a major contributor to disease or risk realization. An issue that can only be overcome by giving awareness about preventive measures like increasing physical activities and modifying life style and changing preferences to healthy food consumption. Conversely, in our study, obese respondents with history of hypertension were more as compared to study done in Karachi city, where 42% of respondents had positive family history, 36% were recorded as obese and 38% labeled as high risk of diabetes in next 10 years. The percentage of people at risk of diabetes were 44% in our result, much higher than recorded in Karachi city, might be due to physical inactivity or unhealthy eating habits which are modifiable factors can be prevented by proper awareness if provided through public health education strategies.¹⁴

About 75% of our respondents had waist circumference more than 102cm, which according to AUSDRISK is labeled as enhanced risk for diabetes. It is not only a measure of central obesity but a tool to know the physical fitness of population, revealing how much population is at risk to diabetes and cardiovascular diseases.Similarly a positive association was sought between central obesity, hypertension and positive family history with development of diabetes.¹⁵ central obesity, a main contributor and along with positive family history, identified as a strong reason for development of diabetes in younger age group.¹⁶

The sub grouping in age strata revealed that males population with age ranging from 40-50 years are less at risk. These findings are consistent to a study in Bangladesh, where they identified aging as a risk factor and a main contributor to the significantly high prevalence in rural areas than urban area, where young people seek better job opportunities in urban areas and leave the old people behind as they are reluctant to leave their environment.¹⁷

A results of meta-analysis done in Nigeria for prevalence and risk factors determination for diabetes mellitus identified two fold increase in the risk of getting diabetes with urbanization¹⁸. They associated urbanization with decrease physical activities and unhealthy eating habits resulting in high glucose blood level a modifiable risk factor for a metabolic syndrome development like diabetes mellitus. This study furthered strengthens our results for the assessment of risk factors of diabetes in Hayatabad area. Where central obesity, positive family history, high blood glucose level, less fruit and vegetables consumption and physical inactivates were identified as main risk factors but it may be because these results belong to the population of an urban area like in our study .i.e. Hayatabad, and the main reason may be urban residency as identified by aforementioned study in above paragraph. Nevertheless, besides aging and positive family history most of the identified risk factors can be modified by health education and awareness programs.

CONCLUSION

The current study demonstrates that the frequency of Type 2diabetes mellitusis high and the common risk factors were positive family history, sedentary life style and greater waist circumference.

RECOMMENDATIONS

Health education messages to be disseminated through mass media focusing especially on healthy life style and nutritional camps should be conducted annually for screening of central obesity in the community.

LIMITATION OF STUDY

Due to cultural barriers, some people were hesitant to participate in our study i.e to measure waist measurement.

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