

Prevalence of Diabetes Mellitus in the Human Population of Bahawalpur, Pakistan

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Abstract

Diabetes Mellitus (DM) is a disease caused when the production of insulin from pancreas is reduced. Blindness, failure of kidneys and severe amputations may be the ultimate consequences associated with this disease. The patients suffering from diabetes are increasing at an alarming rate and WHO predicted that this number will go up with a very high acceleration in coming future (380 million patients by 2025). In Pakistan where the health budget is quite low as compared to its neighboring countries, prevalence of diabetes will be a huge burden to its economy. So, this study was conducted to estimate the ratio of diabetes patients in Bahawalpur city. A total of 716 peoples were tested and 308 were positive for diabetes mean the ratio was 43.01% which was quite alarming. Females were found to be more affected (43.62%) as compared to males (42.43%). This disease is more prevalent in families with normal socioeconomic status. Based on these results we suggest a further in-depth study so in future we could cope with this emerging issue.

Key Words: Diabetes Mellitus, socioeconomic status, Bahawalpur

1. Introduction

Diabetes mellitus (DM) commonly referred to as diabetes is a disease in which the body does not produce enough insulin a hormone in the body. Diabetes Mellitus (DM) is now the leading cause of illness and death worldwide. Diabetes is accompanied by high levels of hospitalization, blindness, kidney failure and severe organ amputations (Cowie & Eberhardt, 1996). Diabetes is a chronic hyperglycemia. Depending on the etiology of diabetes there are some factors that promote hyperglycemia like decreasing the secretion of insulin, production of more glucose and reducing the utilization of glucose (Malani, 2012). Non-insulin dependent diabetes also known as Diabetes mellitus type 2 is a metabolic disorder characterized by high blood glucose in terms of insulin deficiency and resistance (S. L. Robbins & Cotran, 1979). The cases of diabetes is being increasing throughout the globe and according to The World Health Organization, an internationally recognized organization the number of diabetes cases will surely increase from 246 million as in year 2007 to approximately 380 million till 2025 (Whiting, Guariguata, Weil, & Shaw, 2011).

The increasing acceptance of Western lifestyles by people in developing countries has led to a dramatic increase in the incidence of hypertension and DM (Nathan & Herman, 2004). Diabetes is the most prevalent disease, in both developed and under developed countries across the globe (Wild, Roglic, Green, Sicree, & King, 2004). According to the recent studies, the increase in this disease in India is more than 12.1% followed by Pakistan (11.1%) and China (6.1%) (Dong et al., 2005; Khan & King, 1999; Ramachandran et al., 2001). Asians people have a 3.8 times more chance to get to this disease than white Caucasians (Mather & Keen, 1985). In Pakistan about 8 million people have diabetes making it the fourth largest country on the list and the figures according to WHO it will doubled by 2025 (Akhtar, Hussain, Ahmad, & Nazli, 2011). Type 2 diabetes is caused mainly by biological and genetic factors (Risérus, Willett, & Hu, 2009). The definition defined by World Health Organization for Diabetes mellitus is a single raised glucose reading with symptoms, otherwise raised values on two occasions, of either, fasting plasma glucose ≥ 7.0 mmol/l (126 mg/dl) or with a glucose tolerance test, two hours after the oral dose a plasma glucose ≥ 11.1 mmol/l (200 mg/dl) (Alberti & Zimmet, 1998). The increased incidence of type II diabetes is one of the fastest growing public health problems in Pakistan and places a huge burden on its already limited health care budget so diabetes testing will help in future planning and service delivery (Ahmad et al., 2011). Keeping view all about diabetes it was planned to ascertain the prevalence of diabetes in population of Bahawalpur city. So that it would be possible to mitigate such a horrible future of local people due to said disease.

2. Methodology

2.1. Study Area

All the experimental work was done in the Pathology laboratory of Bahawal Victoria Hospital, Bahawalpur, Punjab, Pakistan.

2.2. Random glucose test

About 2 ml venous blood was withdrawn from the cubital vein by following standard operating procedure for blood sampling. During sampling age, gender and socioeconomic status of individual was also recorded. The blood was transferred to the empty centrifuge tubes and allowed to clot for three hours at room temperature. To obtain serum, the clotted blood was spun at 3000 rpm for 30 minutes. The supernatant (Serum) was separated into a dry test tube stored in the refrigerator until used. Serum was loaded to automated glucose analyzer to determine serum glucose levels (Al-Nuaim, 1997). American diabetes association has made standard criteria to determine the blood glucose level. The reference values for a "normal" random glucose test in an average adult are 80-140 mg/dl (3.9-7.8 mmol/l), between 140–200 mg/dl is considered pre-diabetes, and > 200 mg/dl is considered diabetes according to AD (Association, 2012).

3. Results

Study was conducted over a period of six months and the total 716 cases were observed. Out of these 716 peoples the overall Diabetes Mellitus positive cases were 308 which show 43.01% prevalence. Highest prevalence 55.2% was found in March followed by 45.92%, 44.44%, 42.85%, 36.53%, and 28.12% in April, June, January, May and February, respectively (Figure 1).

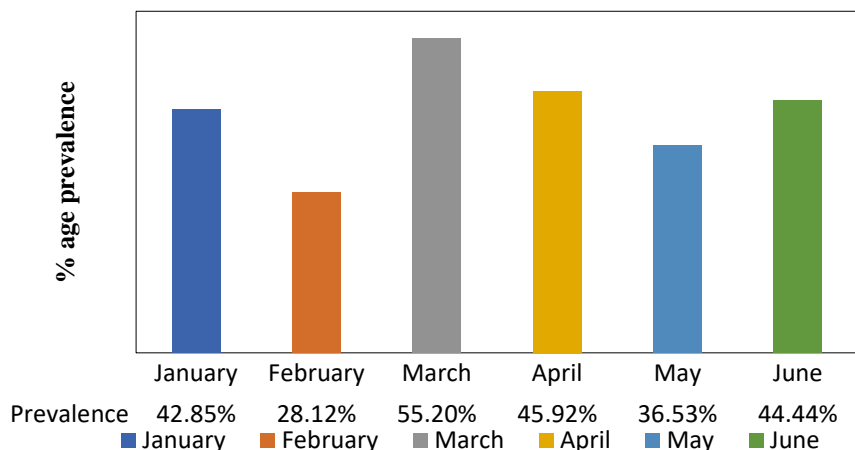


Figure 1: Month wise prevalence of Diabetes mellitus in human population of Bahawalpur City

Out of total 716 subjects, 370 were male and 346 were female. The prevalence of diabetes among male was calculated about 42.43% (157 out of 370) and prevalence in female was found 43.64% (151 out of 346). Mean values of two sample proportions test showed 0.42, 0.44 in males and females respectively. Whose Standard error was 0.026 in males and 0.027 in female at 95% confidential interval (Figure 2).

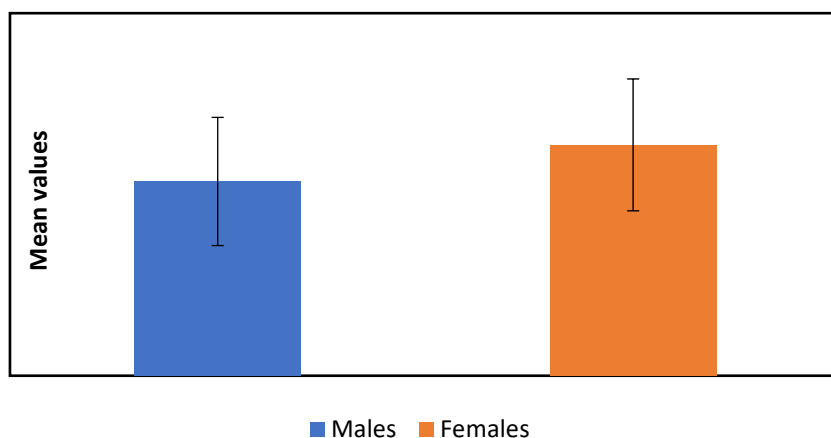


Figure 2: Gender wise prevalence of Diabetes mellitus in human population of Bahawalpur City

Occurrence of diabetes in different age groups was also calculated which show highest incidence of diseases (60.62%) among the 51-70 years old people and lowest in 11-30 years old individuals (28.26%). While 38.77% was

observed among the age of 31-50 years old persons. The prevalence of diabetes mellitus showed relevancy to age as it increased with increasing age in both sexes (Figure 3).

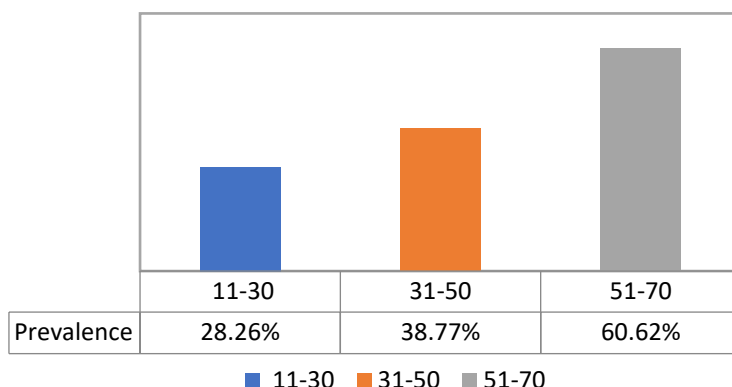


Figure 3: Prevalence of Diabetes mellitus in different age group of human population in Bahawalpur City

With respect to the socioeconomic status (Economic conditions: poor if per month income is less than 10000 pkr, normal if per month income is less than 40000pkr and rich if monthly income is more than 100000 pkr), highest prevalence of diabetes mellitus was 46.31% in the people of normal social status, followed by 42.34% in Rich and in poor was 40.08% (figure 4). Implication of Chi square test resulted high value than “P = 0.01”, indicating that association is present between the living standards and diseased person.

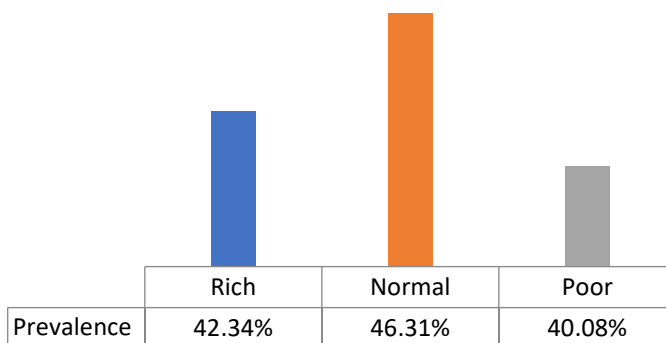


Figure 4: Prevalence of Diabetes Mellitus with Respect to Socioeconomic Status

4. Discussion

Diabetes mellitus (DM) is an incurable metabolic disease that has been shown to be very effective as an economic burden of a developing country. A total of 240 million people are now conformed as the patient of diabetes and according to an estimation this number will grow rapidly in coming years (380 million by 2025) which will increase the burden further on low-income countries. Currently, Pakistan ranks 6th among countries with a high risk of diabetes (Whiting et al., 2011). In urban societies, the prevalence rate of diabetes is 6% in male and 3.5% in female but in rural areas this rate is 6.9% in male and 2.5% in female. Mature age, positive family history with poor socioeconomic status are the major risk factors for this disease (Shaikh, 2009).

4.1. Comparison of Overall all prevalence of Diabetes mellitus:

A total of 716 individuals who visited for diagnosis of Diabetes mellitus were randomly selected for the study, of which 308 were found to be affected. The study showed high prevalence of Diabetes (43.01%) among the population of Bahawalpur City that is higher than previous study done by Zuman in 2009 (19.21%) who conducted a study to find overall prevalence of District Bahawalpur (Zaman, 2006). The reason for increasing rate of prevalence of this disease was that sampling pool belonged to selected individuals who were referred by the physician at pathology laboratory of Bahawal Victoria Hospital. While Zaman (2009) carried out his study by random selection of samples.

4.2. Comparison of gender wise prevalence of Diabetes mellitus:

The prevalence of Diabetes was found high in females (43.64%) as compared to the males (42.43%) which was similar to the Ahmad (2011) who observed that females had high prevalence of DM (8.3%) as compared to males (3.06%) in human population of Kashmir (Ahmad et al., 2011). The reason was that females was house wives, have less outdoor activities hence tend to be more obese which would explain the increase prevalence of diabetes as compared to males. The reason for increase Prevalence of Diabetes in females was due to age, life style modification, and diet and food habits. However, gender different was not significant in Bahawalpur. The similar result was observed by Rahim (2011) who reported Gender different was not significant in Bangladesh and there is no significant difference between males and females (Rahim, Rahman, Mostafa, & Ahmed, 2011).

The prevalence of diabetes found high in females 43.64% as compared to males 42.43% that was dissimilar to Santhosh et al., (2011) who reported that the prevalence of diabetes was high in males as compared to females in rural south Indian Hospital (Santhosh, Vasanth, & Ramanth, 2011).

4.3. Comparison of age wise prevalence of Diabetes mellitus:

The present study revealed that age wise prevalence of Diabetes was highest i.e. 60.62% in age group of 50-60 years. That was similar to the findings of Zuman (2009) who reported the highest prevalence 21.60% in individuals of 50-60 years group in Bahawalpur (Zaman, 2006). Shera (1995) concluded the reason for increased prevalence with increasing age is due to the greater chance of exposure to contributing environmental factors (Shera et al., 1995).

Present study showed that the prevalence of Diabetes mellitus increases with age that was similar to Ahmad (2011) who reported similar results as prevalence of Diabetes mellitus increases with increasing age (Ahmad et al., 2011). The possible reason for increase in prevalence of diabetes was found the habit of less work, less exercise and improved life expectancy. Hence age is considered most consistent risk factor for world over rise in Diabetes mellitus prevalence.

4.4 Comparison of prevalence of Diabetes mellitus with respect to the socioeconomic status:

The prevalence of Diabetes with respect to the socioeconomic status also observed and was highest in average socioeconomic status 46.31%, followed by 42.34% in rich and 40.08 in poor people. This study is similar to Zuman (2009) observed that the prevalence of diabetes increases with increasing income (Zaman, 2006). Among socioeconomic status it has been manifested that income is more associated with DM prevalence especially among women (Choi & Shi, 2001; J. M. Robbins, Vaccarino, Zhang, & Kasl, 2000).

5. Conclusion

In the present study it was found that the human population of Bahawalpur city has high prevalence of diabetes mellitus. The overall prevalence of diabetes among the people of Bahawalpur was 43.01%. Age and socioeconomic status were strongly associated with the increase in diabetes in this study; the increase in diabetes is comparable to data from other parts of Pakistan and compared to other people in developing countries. The reason for the increase in the prevalence rate of this disease is that selected samples are sent by a physician to the pathology laboratory of Bahawal Victoria Hospital. Rising diabetes incidence has become one of the fastest growing public health problems in Pakistan, so diabetes testing will be useful in future planning and service provision.

6. References

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