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Research Paper

Complication and risk factors of diabetes mellitus in the population of Usheri Dara, Khyber Pakhtunkhwa, Pakistan

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Diabetes mellitus (DM) occurs due to relative or absolute deficiency of insulin hormone released from beta cells of islets of Langerhans of pancreas.The present research is regarding the complications and risk factors of diabetes mellitus in Usheri Dara (UD), Dir Upper (DU), Khyber Pakhtunkhwa (KP), Pakistan during June 2013-August 2014. A questionnaire was developed having almost all information related DM. The designed questionnaires were distributed randomly among the people (n=500) of Usheri Dara, which was divided in 7 quadrates, *viz.*, Katten, Jabbar, Almas, Tarpatar, Usheri Khas, Batal and Garkohi. Complications of DM were cardiac myopathy, nephropathy, diabetic foot, however, retinopathy was maximum (4%). Family history of diseases of diabetic patients observed were high cholesterol, heart diseases and others, however, high blood pressure was maximum (6.6%). The duration of insulin therapy used by maximum number of diabetic patients was 7-8 months. Majority of the respondents were college students (20%). It was concluded that the risk factor for diabetes was high blood pressure. Adopting healthy life style and use of proper therapeutic regimen is prerequisite for prevention.

Key words: Complication, diabetes mellitus (DM), epidemic, hyperglycemia, hypertension

INTRODUCTION

The diabetes mellitus (DM) or simply diabetes is the malfunctioning of pancreas, in which it cannot produce insulin or the body has problem in utilizing insulin. According to National Diabetes Data Group (NDDG), Pakistan, it has main types 1 and 2 (Guk and Harris, 1998). It is evolved as an epidemic all over the world. It is one of the metabolic disorders; if not properly managed can lead to long term life threaten complications (King et al, 1998). The chronic hyperglycemia is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels. It damages the blood vessels and basement membrane causing impaired delivery of nutrients and hormones to the tissues resulting in inside damages. The most sites affected are the retina, renal-glomerulus, and nerve-sheath. Its vascular complication occurs in both micro- and macro-vascular vessels. Micro-vascular complications include retinopathy, nephropathy, and neuropathy. Macro-vascular complication comprises peripheral vascular diseases and cardiovascular complication, such as ischemic heart diseases and hypertension (Anonymous, 1993). The severity of complications is modified by genetic factors. Many DM patients do not develop complications even when their glycemic control is not optimal (Raskin and Rosenstock, 1988).

Acute complications include diabetic ketoacidosis, hyperglycemia, diabetic coma, and respiratory infections. A chronic complication includes diabetic cardio myopathy, nephropathy, neuropathy, and retinopathy. If

macro-vascular disease occurs to DM patients, it will result in the cardiovascular diseases. Diabetes mellitus is a big cause of morbidity and mortality due to its complications occurs like cardio vascular, renal, retinal and neuropathic (Nathan, 2005).

Blindness is one of the big causes due to DM, which occurs in elder stage,that is between 24-74 years. Diabetic retinopathy accounts for 12000-24000 new blinds for each year. Especially DM type 2 is the big cause for the end stage of renal disease (ESRD), example kidney failure. According to US Centers for Disease Control and Prevention (CDCP), DM accounts for 44% new cases of ESRD therapy, that is, at initial stages renal replacement therapy or when the individual is on dialysis or during the kidney transplantation (Online, 2015). The rate of coronary heart diseases (CHD) is 2-4 times higher in individual, which suffered from DM than those are free from DM (Anonymous, 1993).

Due to DM type 2, heart diseases or strokes are the big reason for mortality, almost 2-3% of individuals die because of it. Males have double; however, women have 3-4 time higher chances to suffer from heart diseases or strokes due to DM type 2. Before maturity, it is one of the big reasons of illness and death in majority of the countries. Due to DM type 1, cardio-vascular diseases cause damaging of large blood vessels and death >50% individuals suffered from DM, while when the small blood vessels are damaged, it can effects many parts of the body (Khan et al., 1999). Actually, the complications of it are decreased in the patients whose blood glucose level is properly controlled. Most health problems can increase the diagnostic effect of it like smoking, high cholesterol level, obesity, high blood pressure or no exercise. Obesity plays an important role in the insulin resistance both in diabetic and non-diabetic persons. Insufficient, excessive, and decreased quality of sleep have all been linked to metabolic disorders including DM (Seshadri, 2015). When weight loss occurs, there is some decrease in insulin resistance. Obese youngsters can also at risks to develop DM type 2 (King et al., 1998). It has a big relation with family history and lineage than DM type 1, though; it has also relation with environmental factors. In the incidence of it, genetic plays a big role, therefore, it can be genetically transferred in families from parents to offspring (Nisar et al., 2008). The aims of this paper are to estimate the complications and risk factors as well as to develop awareness in the community about DM.

METHODOLOGY

Usheri Dara is located between 72^{o} 16'-72^{o} 50' north latitude and 35^{o} 06'-35^{o} 16' east longitudes in Pakistan. Altitude is approximately 1800 m above the sea level. The total area is 113373 acres. The total population is 39386. The minimum and maximum temperature in January has been recorded as 3.3 and 13.3 °C, respectively. The UD is home to a number of wildlife species, including mammals such as snow leopard, *Panthera uncia* (Schereber, 1775); common leopard, *Panthera pardus* (L, 1758); musk deer, *Moschus anhuicnsis* (L, 1758); black bear, *Ursus americanus* (Pallas, 1780); wolf, *Canis lupus* (L, 1758); yellow throated marten, *Martes flaviqula* (Pinel, 1792); red fox, *Vulpes vulpes* (L, 1758); pika, *Ochotona daurica* (Link, 1795); golden marmot, *Marmota caudate* (Geoffroy, 1844) and rhesus monkey, *Macaca mulatta* (Zimmermann, 1780). Himalayan monal pheasant, *Lophophorus impejanus* (Latham, 1790); Himalayan snow cock, *Tetraoggallus himalayensis* (Gray, 1848) and snow partridge, *Lerwa lerwa* (Hodgson, 1837) are some of key bird species found here. At different elevation different types of vegetation occurs in UD. Blue pine, *Pinnus wallichiana* (Jacks, 1839) is dominated species with scattered trees of Himalayan cedar, *Cedrus deodara* (Don, 1831) with frequent occurrence of Himalayan popular, *Populous ciliatae* (Royle, 1888) (Figure 1) (Online, 2013).

The current study was conducted through survey regarding the complications and risk factors of diabetes mellitus (DM) among people of community of Usheri Dara (UD), Dir Upper (DU), Khyber Pakhtunkhwa (KP), Pakistan, which was divided in 7 quadrates: Katten, Jabbar, Almas, Tarpatar, Usheri Khas, Batal and Garkohi. A questionnaire was designed in Computer Program Microsoft Word (CPMSW) in such a way that it covers all the information about the complications, risk factors, frequency of diseases other than DM, duration of insulin therapy, types of narcotics used by DM patients and educational levels of the people. The questionnaires were distributed randomly among the peoples (n=500) of community of mentioned quadrates during June 2013-August 2014. Data was analyzed statistically by using CPMSE and Statistical Package for Social Sciences (SPSS) version 16. They were showed in percentage (%).

RESULTS

A survey was conducted to determine the complications and risk factors of DM in the population of UD during June 2013-August 2014. The questionnaires (n=500) were distributed randomly among the people of 7 quadrates of Usheri Dara, *viz.,* Katten, Jabbar, Almas, Tarpatar, Usheri Khas, Batal and Ghar Kohi. The complications of DM were occurred in different body-organs,however, their maximum frequency was in eyes (4%), moreover, minimum was in heart and kidneys (each 1.2%) (Figure 2a). The patients were suffered from diseases other than DM, that is hepatitis was maximum (8.4%), however, cancer was minimum (0.6%) (Figure 2b). Duration of insulin therapy was 7-8 months used by maximum numbers (3%), however, 1-6 months used by

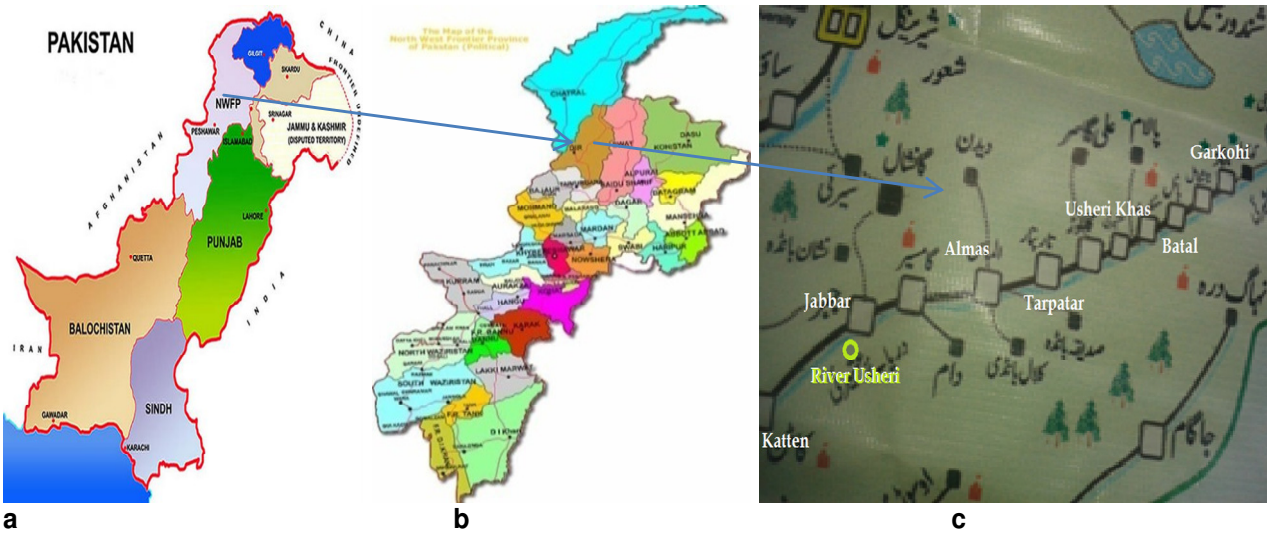


Figure 1. Map of 7 quadrates of the study area viz., Katten, Jabbar, Almas, Tarpatar, Usheri Khas, Batal and Garkohi are located in Usheri Dara (c) in Khyber Pakhtunkhwa (b) one of the province of Pakistan (a); where the present research was conducted during June 2013-August 2014 (Online Maps, 2013).

minimum number (0.8%) of them (Figure 2c). Maximum (6.6%) of family members of them were suffered from high blood pressure, however, minimum (3.4%) were from heart diseases (Figure 2d). The cigarette was used by maximum number (12%), however, the hash was used by minimum number (0.6%), moreover, the opium and heroin was not used by them (Figure 2e). They were maximum (20%) of college, however, minimum (10.6%) of secondary school students (Figure 2f). The cousin marriages were found 20% (maximum) among parents of DM patients (Figure 2g).

DISCUSSION

A survey was made to estimate the complications and risk factors of DM in the population of Usheri Dara during June 2013-August 2014. The people among which questionnaires (n=500) were distributed randomly belong to the 7 quadrates of the study area, *viz.,* Katten, Jabbar, Almas, Tarpatar, Usheri Khas, Batal and Ghar Kohi.

Jamal et al. (2011), made a cross section study in July 2008 in Rawalpindi, which is one of the cities in Northern-Punjab of Pakistan. An area was selected in Rawalpindi city with mixed population of almost all provinces with different socio-economic groups. The 313 houses were selected through systematic random sampling technique. The main risk factors identified were obesity, family history and hypertension. In the current study, the main risk factors were hypertension (6.6%) and high cholesterol (4.2%), which is also somewhat similar to the above. The similarity in both of the result may be due to the same environment and genetic factors.

Mangesha and Qadeer, (1997) made a community based study in the Gaddap-town, Karachi from January 2006-December 2008. Diabetic retinopathy was seen in 27.43% of the DM cases. In the current study, the frequency rate of diabetic retinopathy observed was 4%, which is significantly much lower than the above. In the present case, the low prevalence of diabetic retinopathy may be due to the proper use of therapeutic regimen, environmental factors, knowledge about DM and its complications.

Surana et al. (2008) studied the level of syndrome in DM patients in Urban-Indian population. A sample of 5088 type 2 diabetic patients was taken. Panel-III precautions for cholesterol were used for diagnosis. The important risk factors for DM were high blood pressure, hypertriglyceridemia followed by greater body mass index. In the current study, it was observed that high blood pressure (6.6%), high cholesterol (4.2%) and heart diseases (3.2%) are the main risk factors for DM. The difference in the result may be due to different environment, genetic factors, and awareness of people about the risk factors of DM.

Altobelli et al. (1998), examined that type 1 DM is a disease of childhood in South-India. This disease may be associated with environmental and genetic factors. Data was collected randomly by using questionnaire method. The important factors included in this study were family history of types 1 and 2 DM patients. Logistic regression technique was used for checking the association of type 1 DM among first and second-degree relatives. The authors concluded that the risk of DM for children whose fathers are diabetic is 11 times higher than the father without diabetes. In the current work, it was observed that

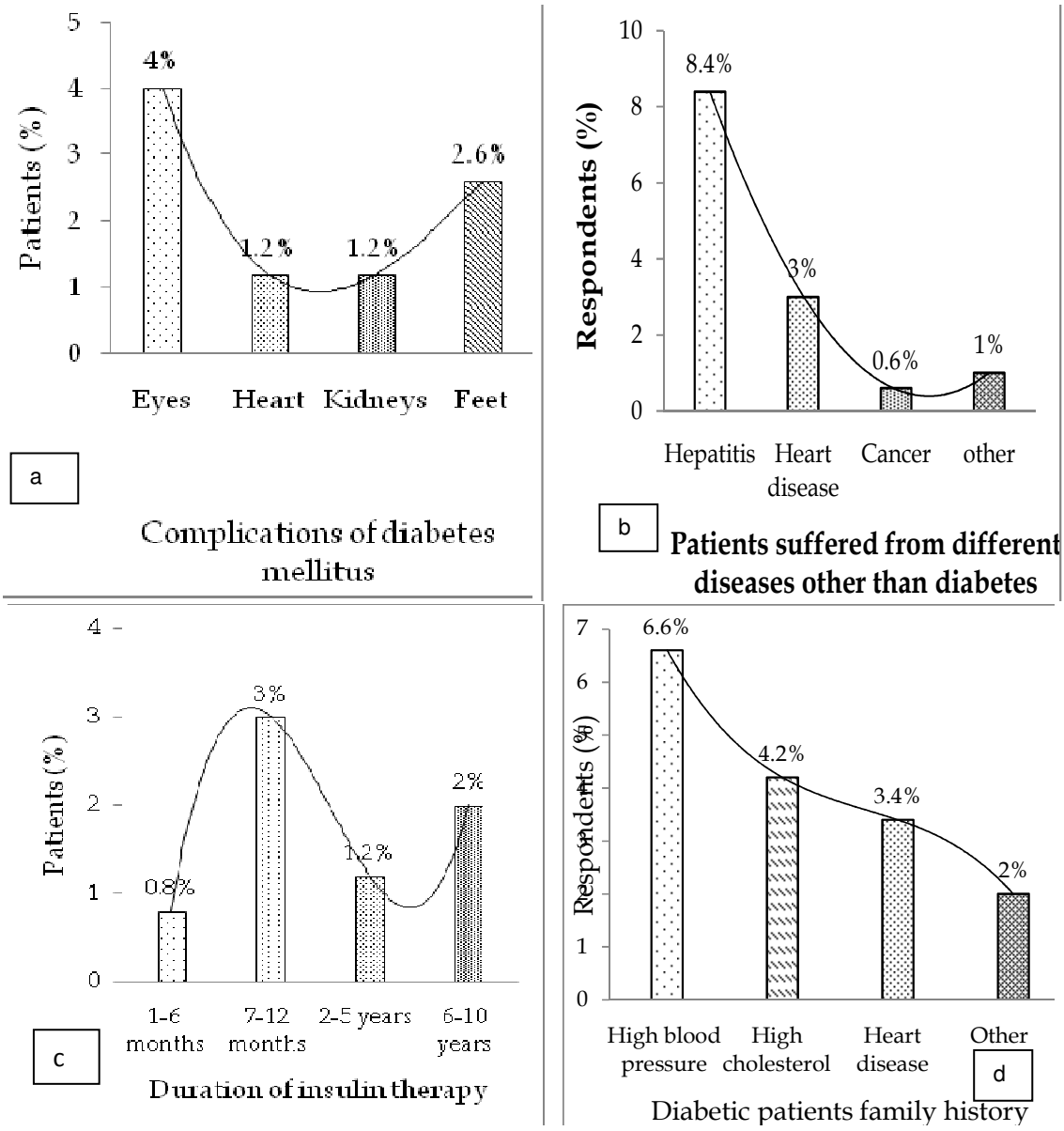
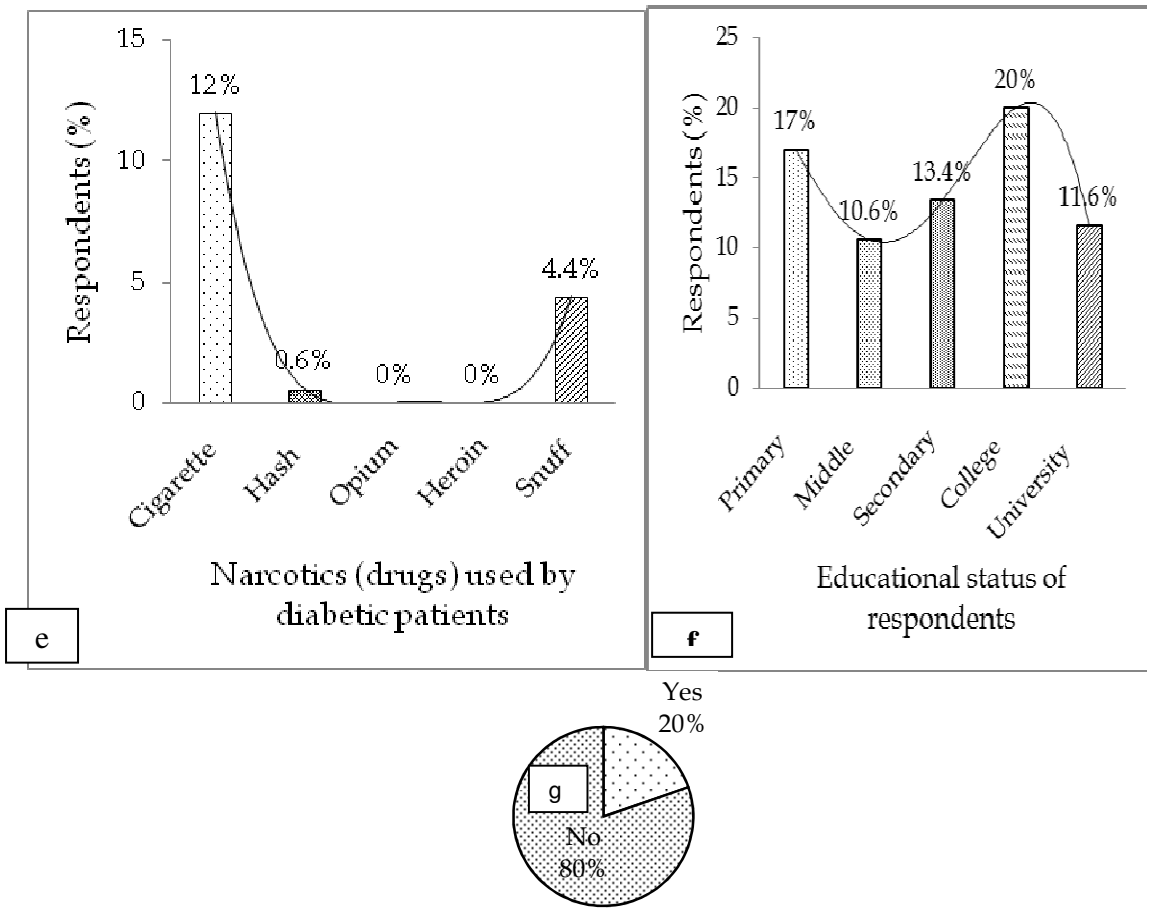


Figure 2. Complication and risk factors of diabetes mellitus (DM) in the population of Usheri Dara, Dir Upper, Khyber Pakhtunkhwa, Pakistan were investigated in the present survey during June 2013-August 2014: complications of DM (a); frequency of other diseases than DM (b); duration of insulin therapy (c); family history of diseases (d); different types of narcotics used (e); educational levels of respondents (f); cousin marriage among parents of DM patients (g); Usheri Dara has been divided in 7 quadrates: Katten, Jabbar, Almas, Tarpatar, Usheri khas, Batal and Garkohi, where questionnaires (n=500) were distributed randomly; trend line: polynomial line; data were analyzed statistically by using Computer Program Microsoft Excel (CPMSE) and Statistical Package for Social Sciences (SPSS) version 16; data are showing in percentage (%).

those people who have family history of DM have greater chances of becoming diabetic patients than those who have no family history of DM. The similarity in the results is due to the genetic factors and the same method of data collection.

Bos and Agyemang, (2013), made a systematic literature review on DM prevalence and complications in North Africa from January 1990-July 2012. Literature searches were conducted using electronic data-bases. The prevalence of chronic DM complication ranged from 8.1-41.5% for retinopathy, 21-22% for albuminuria, 6.7-46.3% for nephropathy and 21.9-60% for neuropathy. In the current work, the prevalence of DM complication was 4% for retinopathy and 1.2% for nephropathy, which is



Cousin marriages among parents of DM patients.

Figure 2. Complication and risk factors of diabetes mellitus (DM) in the population of Usheri Dara, Dir Upper, Khyber Pakhtunkhwa, Pakistan were investigated in the present survey during June 2013-August 2014: complications of DM (a); frequency of other diseases than DM (b); duration of insulin therapy (c); family history of diseases (d); different types of narcotics used (e); educational levels of respondents (f); cousin marriage among parents of DM patients (g); Usheri Dara has been divided in 7 quadrates: Katten, Jabbar, Almas, Tarpatar, Usheri khas, Batal and Garkohi, where questionnaires (n=500) were distributed randomly; trend line: polynomial line; data were analyzed statistically by using Computer Program Microsoft Excel (CPMSE) and Statistical Package for Social Sciences (SPSS) version 16; data are showing in percentage (%).

very low as compare to the above. The difference in the results may be due to not proper use of the medication and awareness of people about DM in the study of Bos and Agyemang (2013).

Kide et al. (2014), reported that results on basis of knowledge and awareness included: 55.36 % ($P < 0.05$) urban and 43.44 % rural people knew that diabetes is metabolic disorders; 43.84 % ($P < 0.05$) urban and 27.55 % rural people knew the symptoms of diabetes; 65.54 % ($P < 0.05$) urban, 39.21 % rural people know that which factor affecting diabetes;72.93 % ($P < 0.05$) urban, 37.60 % rural population familiar about ranges about blood sugar levels; 53.91 % ($P < 0.05$) urban and 35.27 % rural population aware that diabetes can cause complications in other organs; 72.37 % ($P < 0.05$) urban and 43.37 % rural population aware that obesity can cause diabetes in Wardha, india. However, in the present survey, community of Ushiri Dara was mostly uneducated, therefore, they lack about fore-mentioned knowledge related to diabetes. Therefore, this paper provides awareness to the community and base line for further research.

Conclusion

The study observed that complications of DM were cardiac myopathy, nephropathy, diabetic foot and

retinopathy. Diabetic retinopathy was common in the most of the patients. The most frequent disorder other than diabetes was hepatitis. Most of the diabetic patients have high blood pressure in their family. Narcotics (drugs) used by the diabetic patients were cigarette, hash and snuff.

Recommendation

Free seminars, symposium and camps are required to be arranged at different community centers about DM and its complications for awareness in the people. Moreover, mass education is required to know about the causes and risk factors of DM.

CONFLICT OF INTEREST

The authors declare no conflict of interest. The present research complies with the current laws of the institute and country, in which they were performed.

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REFERENCES

Altobelli E, Chiarolli M, Verrotti A (1998). Family history an drisk of insulin dependent diabetes mellitus. Acta Diab. 35(1): 57-60.

Anonymous (1993). The effects of intensive treatment of diabetes on the development and progression of long-term complication. J. Med Asso. 49(9): 318-321.

Bos A, Agyemang A (2013). A Prevalence and complication of diabetes mellitus in North Africa. Bio Med Cent. 13(3): 387-391.

Guk CC, Harris MI (1998). Mortality in adults with and without diabetes. Diab Care USA. 21(2):1138-1145.

Jamal Z, Bhatti F, Akhter N, Rasheed U (2011). Prevalence and risk factors for diabetes mellitus in a selected population of a city of Punjab. Pak. J. Med. Asso. 61(40): 109-113.

Khan A, Din JU, Khattak KN (1999). Prevalence of diabetes mellitus in relation to diet and physical work in the northern areas of Pakistan. Sarhad J Agri. 15(5):479-484.

Kide S, Rangari A, Shiral R (2014). Knowledge and awareness of diabetes amongst diabetes patients in Wardha region. Int. J. Diabetes Dev. Ctries. 34(4): 232.

King H, Alberts RE, Herman WH(1998). Global burden of diabetes. Diab. Care USA. 21(2): 1414-1431.

Mangesha B, Qadeer A (1997). Heritability of diabetes mellitus. Pak. J. Med. Asso. 74(1): 37-43.

Nathan DM, Cleary PA, Backlund JY (2005). Intensive diabetes treatment and cardiovascular disease in patients with type 1 diabetes. N. Engl. J. Med. 22:353 (25):2643-53.

Nisar N, Khan IA, Qadri MH, Sher SA(2008). Knowledge and risk assessment of diabetes mellitus at primary care level. Pak. J. Med. Sci. 24(5): 667-672.

Online (2015). US Centers for Disease Control and Prevention (CDC): http://www.cdc.gov/ (accessed: 18/4/2015)

Online, maps. www.google.com; 2013; (Accessed: 07/12/2013).

Online. Districts census report; www.google.com; 2013; (Accessed: 23/11/2013).

Raskin P, Rosenstock J (1988). Diabetes and its complication. World J. Diabetes Birm. 4(5): 417-435.

Seshadri KG (2015). Sleeping well and on time-a prevention and prescription for diabetes? Int J Diab. Dev. Ctries. 35(1):1–2.

Surana SP, Shah DB, Gala K (2008). Prevalence of metabolic syndrome in an urban Indian diabetic population. World J. Diab. 56(3): 865-868.