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WOMEN AT RISK OF CONTRACTING DIABETES: A STUDY AMONGST PUNJABI POPULATION

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Abstract:

Diabetes can affect anyone, regardless of age, race, gender and lifestyle. Epidemiological and biochemical study has been undertaken on 1000 subjects; newly detected and total diabetic subjects are more abundant in females than in their counterparts. The newly detected cases in males are 3.2% whereas in females it is 8.3%. However, known diabetic cases do not reflect any significant ($p>0.05$) difference as in males it is 3.9% in comparison to females 3.6%. Most of the women are less educated or housewives and are generally ignorant about this disease, which reflect the cause of remaining, undiagnosed in them. The present research work reveals the level of obesity in women to the tune of 30.8% in Punjabi female subjects. This study opens up a new area of research to detect diabetes mellitus at the beginning for safeguarding the public health.

Key words: Diabetes, Epidemiological, Newly detected Diabetics, Known Diabetics and Borderline subjects, Obesity.

INTRODUCTION

Increase in the prevalence of type 2 diabetes is posing a massive health problem in both developed and developing countries. Several lifestyle factors affect the incidence of type 2 diabetes (Frank et al, 2001). Obesity and weight gain dramatically increase the risk and physical inactivity also elevates the risk of type 2 diabetes (Shai et al,2006). Diabetes threatens to overwhelm developing nations as they switch to westernized lifestyles that emphasize rich foods and sedentary living. Epidemiological study has made a major contribution to our understanding of diabetes and its complications. Recent epidemiological developments can now reduce the risk of diabetes itself. Women, because of their less physical activities are at greater risk of developing diabetes in conjunction with modernization. Females have a higher

prevalence of obesity also appear to be at much higher risk of developing diabetes. The basic premise of the present study is to evaluate the various epidemiological determinants and biochemical symptoms, which may land the individual in the domain of this disease.

METHODOLOGY

The present epidemiological and biochemical study was undertaken in district Sangrur, Punjab, India. The random sample survey was undertaken and 1000 subjects were selected randomly for questioning regarding different aspects of epidemiology. Out of these 1000 samples, 500 were from urban and 500 from rural population. They were questioned personally, using a questionnaire that is designed for collection of data and general information regarding various epidemiological factors. Fasting and random blood sugar levels and body mass index were also measured.

OBSERVATIONS

The observation regarding sexual differences on the total population screened for diabetes mellitus provides some significant information. Out of total (445) women, 135 (30.3%), 37 (8.3%), 16 (3.6%) and 53 (11.9%) were borderline, newly detected, known and total diabetics, respectively (Table 1).

Table 1: Random Study of males and females from the total pouplation i.e. Normal, Borderline, Newly detected, Known diabetic and Hypoglycemic subjects from district Sangrur, Punjab (India) based on 1000 subjects.

Status of subjects		Male n = 555	Female n = 445
Normal subejcts (653)	n (%)	403 (72.61)	250 (56.17)
	BS (F)	81.432 ± 8.809	81.456 ± 9.763
	BS (R)	116.213 ± 14.278	116.760 ± 15.282
Borderline subjects (241)	n (%)	106 (19.09)	135 (30.33)
	BS (F)	96.149 ± 10.258	98.274 ± 10.740
	BS (R)	161.698 ± 17.008	158.704 ± 17.494
Newly detected diabetic Subjects	n (%)	18 (3.24)	37 (8.31)
	BS (F)	143.556 ± 31.049	137.676 ± 28.152
	BS (R)	229.000 ± 55.597	234.514 ± 48.203
Known diabetic subjects (38)	n (%)	22 (3.96)	16 (3.59)
	BS (F)	158.227 ± 46.094	157.438 ± 38.151
	BS (R)	226.591 ± 67.439	255.812 ± 69.496
Hypoglycemic subjects (13)	n (%)	6 (1.08)	7 (1.57)
	BS (F)	46.833 ± 7.081	54.857 ± 3.681
	BS (R)	85.333 ± 17.585	94.000 ± 19.332
Total diabetic subjects (ND+K) (93)	n (%)	40 (7.21)	53 (11.91)
	BS (F)	151.625 ± 40.689	143.642 ± 32.787
	BS (R)	249.675 ± 65.132	240.943 ± 56.353

BS: Blood Sugar Level mg / dl
(F): Fasting, (R): Random,
±: Standard Deviation
n: Number of subjects in each group ;
N.D.: Newly detected diabetic subjects.
K: Known diabetic subjects.

In random study of males and females, borderline cases are more in females (30.3%) than the males (19.1%). It has also observed that the newly detected and total diabetic subjects are more abundant in females than their counterparts. The newly detected cases in males are

3.2% whereas in females it is 8.3%, a significant difference ($p<0.001$) has been found. However, known diabetic cases do not reflect any significant ($p>0.05$) difference as in males it is 3.9% in comparison to females 3.6%. There is also not any significant ($p>0.05$) difference between males and females in hypoglycemic subjects (Table 2).

Table 2: Statistical Analysis

Status of subjects	X^2	DF	p	NS/HS
Normal	30.043	1	<0.001	HS
Borderline	17.358	1	<0.001	HS
Newly detected diabetic	13.214	1	<0.001	HS
Known diabetic	0.108	1	>0.05	NS
Hypoglycaemic	0.325	1	>0.05	NS

No. : Number of subjects,
X^2: Chi sqaure test,
DF: Degree of freedom,
p: Probability,
HS: Highly significant,
NS: Non significants

Obesity is more pronounced in females as compared to males. Value for BMI >25 are 30.8% in females and 22.5% in males.

DISCUSSION

The present work throws a new light on the population from district Sangrur and for the first time from Punjab (India). In the present study, 69.9% women are undiagnosed in the total diabetic females and only 30.2% are known diabetic. Ramachandran et al. (1997) in Madras, South India found that the increase in prevalence of diabetes was significant in women. In 1989, 7.6% women were diabetic and in 1995, it increased to 12.7%. High prevalence of diabetes in women has also been reported by various other workers such as Papoz et al. (1996), Yang et al. (1998) and Harris et al (1998).

Prevalence of diabetes mellitus in Pakistani patients has also been reported previously and is found that diabetes mellitus is more common in females of Pakistani population (Shera et al., 1999 and Hameed et al., 1995).

It is further pointed out that most of the women are less educated or housewives and are generally ignorant about this disease which reflect the cause of remaining undiagnosed in them. In the present study, 8.31% women are newly detected and 30.3% are in borderline category. In case of men the same figures are 3.2% and 19.1% respectively. The screening is also done with respect to physical activities and it becomes evident that 40.7% males are involved in physical activities but in females only 29.8% are involved in such activities and 70.1% are involved in sitting type of work. Hence women, because of their less physical activities are at greater risk of developing the disease. The other reasons are unawareness, illiteracy, ignorance about intake of calories and regarding quantity and quality of food and dependence on domestic helps.

Most of the workers such as Tuomilehto (1986) and Marchal et al. (1990), Joner and Sovik

(1991) reported a higher prevalence of diabetes in males but their studies were based on known diabetic subjects or from the hospital records. These studies showed that only males seek hospital or private medical advice more often than the females and are of course fallacious to be connected with prevalence to any sex. The change in the adipose tissue and body composition adds to the risk of problems for type 2 diabetes because the extra fat increases the blood sugar. Also, girls with diabetes are more likely to gain weight during puberty and have an increased risk of developing hyperandrogenism (higher than normal levels of androgen) and Polycystic Ovary Syndrome. Another important thing to consider about girls who have diabetes is that for some, their blood sugar increases a few days before their menstrual cycle begins and then it drops during the first few days of their period. Although the delay of puberty seems to be minimized in well controlled diabetes there is still more irregularity and amenorrhea (no bleeding at all). There is no difference in the level of estrogen in females with diabetes and those with no diabetes. However, these hormonal changes make glycemic control harder for girls early in puberty, which can lead to organ damage as well as cardiovascular issues. For this reason, it is important for these girls to have well controlled blood sugar levels.

The present work reveals the level of obesity in women is 30.8% in the Punjabi subjects. The basic cause of such a situation may be due to the high concentration of estrogen and other factors, pregnancy and menopause are significant factors in the development of obesity in women. The risk of diabetes is significantly higher among Asians, Hispanics, and blacks than among whites before and after taking into account differences in BMI. Weight gain is particularly detrimental for Asians (Iris, 2006). In the present study, diabetes was found to be more prevalent in post-menopausal women. Both rapid urbanization and industrialization in countries together with the adoption of modern life styles that adversely affect wealth have brought new problems in the form of non-communicable diseases in many developing countries. Similar trend is happening in the area of study but more pronounced is the rural to urban shift.

Hence this study indicates that the various epidemiological factors are at work in different populations even in the same country. Females have a higher prevalence of obesity and non-insulin dependent diabetes mellitus. Causes of weight gain include reduced physical activity and increased food intake. Excess weight can increase risk of high cholesterol, high blood pressure and insulin resistance, which can lead to type 2 diabetes. Majority of cases of type 2 diabetes could be prevented by weight loss, regular exercise, modification of diet, abstinence from smoking, and the consumption of limited amounts of alcohol. Weight control would appear to offer the greatest benefit (Frank et al, 2001).Effective primary prevention strategies are needed, to be intensified among high risk groups. Awareness of the disease needs to be promoted. However, to elucidate the magnitude of the problem, more epidemiological studies will be required at country level.

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REFERENCES

1. Frank B. Hu, M.D., JoAnn E. Manson, M.D., Meir J. Stampfer, M.D., Graham Colditz, M.D., Simin Liu, M.D., Caren G. Solomon, M.D., and Walter C. Willett, M.D.Diet, Lifestyle, and the Risk of Type 2 Diabetes Mellitus in WomenN Engl J Med 2001; 345:790-797
2. Hameed, K., M. Kadir, T. Gibson, S. Sultana, Z. Fatima and A. Syed (1995). The frequency of known diabetes, hypertension and ischaemic heart disease in affluent and poor urban populations of Karachi, Pakistan. Diabet. Med., 12: 500-03.

3. Harris, I. Maureen, Flegal M. Katherine, Cowie C. Catherine, Eberhardt S. Mark, Goldstein E. David, Little R. Randie, Wiedmeyer, Hsiao-Mei, Byrd-Hoit D. Dauta, (1998). Prevalence of diabetes, impaired fasting Glucose, and impaired glucose tolerance in U.S. adults. Diabetes Care, 21 (4): 518-524.
4. Iris Shay, PHD, Rui Jiang, MD, JoAnn E. Manson, MD, Meir J. Stampfer, MD, Walter C. Willett, MD, Graham A. Colditz, MD and Frank B. Hu, MD.Ethnicity, Obesity, and Risk of Type 2 Diabetes in WomenA 20-year follow-up study Diabetes Care 2006 Jul; 29(7): 1585-1590.
5. Joner, G. and Sovik, O. (1991). The incidence of Type 1 (insulin-dependent) diabetes mellitus 15-29 years in Norway 1978-1982. Diabetologia 34 : 271- 274.
6. Marchal, Levy, C., Papoz, L., de Beaufort, C., Doutreix, J., Froment, V., Voirin, J., Collignon, A., Garros, B., Schleret, Y. and Czernichow, P. (1990) Incidence of juvenile Type 1 (insulin-dependent) diabetes mellitus in France. Diabetologia, 33: 465-469.
7. Papoz Laure, Barny Sylvie, Simon Dominique and The CALDIA Study Group. (1996). Prevalence of diabetes mellitus in New Caledonia: Ethnic and Urban-Rural Difference. Am. J. of Epidemiol.143 (10): 1018-1025.
8. Ramachandran, A., Snehalatha, C., Latha, E., Vijay, V. and Viswanathan, M. (1997). Rising prevalence of NIDDM in an urban population in India. Diabetologia, 40: 232-237.
9. Shai I, Jiang R, Manson JE, Stampfer MJ, Willett WC, Colditz GA, Hu FB. Ethnicity, obesity, and risk of type 2 diabetes in women: a 20-year follow- up study.Diabetes Care. 2006 Jul;29(7):1585-90.
10. Shera, A.S., G. Rafique, I.A. Khawaja, S. Baqai, I.A. Khan, H. King and K.I. Ahmad (1999). Pakistan National Diabetes Survey Prevalence of glucose intolerance and associated factor in North West Frontier Province (NWFP) of Pakistan. J. Pak. Med. Assoc., 1999; 49: 206-11
11. Tuomilehto, J., Nissinen, A., Kivela, S.-L., Pekkanen, J., Kaarsalo, E., Wolf, E., Aro, A., Punsar, S. and Karvonen, M.J. (1986). Prevalence of diabetes mellitus in elderly men aged 65 to 84 years in eastern and western Finland. Diabetologia 29: 611-615.
12. Yang, Ze, Wang, Kean, Li, Tianlin Sun, Wei, Li, Yurni, Chang, Yue Fang, Dorman, S. Janice, Laporte, E. Ronald, (1998). Childhood diabetes in China. Diabetes Care, 21 (4): 525-529.