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RESEARCH ARTICLE

Clinical profile of type 2 diabetic patients in the selected area of Kannur, Kerala.

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Abstract

Diabetes Mellitus is a metabolic disorder characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism, resulting defects in insulin secretion, insulin action or both (WHO, 2011). Among the various types of diabetes type 2 is the most common form affecting approximately 90 to 95 percent of diabetics worldwide and accounts for most of the public health burden attributable to diabetes (Tuomilehto, 2006; Cox et al., 2004). Diabetes mellitus, with its attendant acute and long term complications, and the myriad of disorders associated with it, is a major health hazard. Attention must be paid not only to the treatment of diabetic patients but also in setting up of a complete infrastructure which would facilitate a holistic approach by enhancing knowledge, and thereby changing the attitude and practices of the patients. This study is an attempt to find out the signs and symptoms and clinical profile of patients. Personal interview and Clinical screening was done 300 subjects with the help of physicians in respective hospitals. In the present study majority (57.3%) of the subjects experienced extreme fatigue followed by polydipsia (excessive thirst) (44.0%), polyuria (excessive urination) (35.7%), polyphagia (excessive hunger) (32.0%), loss of weight (22.7%), joint pain (16.3%) and giddiness (13.7%). Blood glucose level of six percent of the diabetic patients were under the normal range of 80 to 110 mg/100ml and 60 percent of the subjects recorded normal BP level. Cholesterol level of women diabetic exceeded that of men, in both borderline as well as high risk groups, indicating that female diabetics were on a higher risk than male

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Background

Studies from different parts of India have also reported a steady increase in the prevalence of diabetes from 2 percent in the 1970s to more than 15 percent in the early 2000s. The highest rates of diabetes prevalence are in India's southern States (Mohan, 2004) with Kerala takes the top position with a prevalence rate of 16.2 percent (Thankappan et al., 2007). Notably, diabetes affects all social strata of population. Although the prevalence is highest among the upper classes (Mohan, 2004), complications related to diabetes such as coronary heart disease, neuropathy, cataract, peripheral vascular disease, dyslipidemia and hypertension tops among the lower social classes (Ramachandran et al., 2001). Since diabetes is a chronic disease, most diabetic patients need to continue their treatment for the rest of their lives, the emphasis is usually therefore, on the control of the condition through a tight schedule of blood glucose and urine sugar monitoring, medication and adjustment to dietary modification. An awareness on the clinical profile will help people to understand the disease and control at the earliest.

Methodology

A total of 300 type 2 diabetic patients (150 male and 150 female), were drawn from three specialty hospitals of Kannur. The selected subjects were patients who had type 2 diabetes diagnosed by a physician and were undergoing follow-up care and treatment in the above selected hospitals. Personal interview method was adopted in investigation as it provides ample opportunity to interact with the sample population. Clinical screening of all the subjects was done with the help of physicians in the respective hospitals. Separate clinical assessment schedule developed for the purpose was used to collect clinical and biochemical data. The content of assessment schedule prepared and screened by the same panel of eight experts. Data collected for the study were compiled and subjected to statistical analysis on computation of percentages

Results and Discussions

Table: 1. Signs and symptoms of diabetes experienced by subjects at pre and post- diagnostic periods

Particulars	Pre-diagnostic period			Post-diagnostic period		
	Male (n=150)	Female (n=150)	Pooled (n=300)	Male (n=150)	Female (n=150)	Pooled (n=300)
Polyuria	58 (38.7)	49 (32.7)	107 (35.7)	10 (6.7)	5 (3.3)	15 (5.0)
Polydypsia	76 (50.7)	56 (37.3)	132 (44.0)	7 (4.7)	5 (3.3)	12 (4.0)
Polyphagia	45 (30.0)	51 (34.0)	96 (32.0)	4 (2.7)	6 (4.0)	10 (3.3)
Fatigue	91 (60.7)	81 (54.0)	172 (57.3)	55 (36.7)	48 (32.0)	103 (34.3)
Loss of wt	43 (28.7)	25 (16.7)	68 (22.7)	29 (19.3)	11 (7.3)	40 (13.3)
Loss of appetite	7 (4.7)	7 (4.7)	14 (4.7)	3 (2.0)	6 (4.0)	9 (3.0)
Muscle Cramps	10 (6.7)	14 (9.3)	24 (8.0)	33 (22.0)	23 (15.3)	56 (18.7)
Joint pain	24 (16.0)	25 (16.7)	49 (16.3)	42 (28.0)	37 (24.7)	79 (26.3)
Body pain	13 (8.7)	15 (10.0)	28 (9.3)	26 (17.3)	30 (20.0)	56 (18.7)
Chest pain	5 (3.3)	3 (2.0)	8 (2.7)	18 (12.0)	13 (8.7)	31 (10.3)
Palpitation	6 (4.0)	11 (7.3)	17 (5.7)	27 (18.0)	23 (15.3)	50 (16.7)
Breathlessness	1 (0.7)	7 (4.7)	8 (2.7)	32 (21.3)	13 (8.7)	45 (15.0)
Giddiness	25 (16.7)	16 (10.7)	41 (13.7)	24 (16.0)	25 (16.7)	49 (16.3)
Numbness	4 (2.7)	8 (5.3)	12 (4.0)	21 (14.0)	26 (17.3)	47 (15.7)

(Numbers in parentheses indicate percentages)

(Multiple responses)

The signs and symptoms initially seen in patients with diabetes were not uniform. According to Bakhru (1996) a diabetic feels hungry and thirsty most of the time, does not put on weight, though eats every now and then, gets tired easily both physically and mentally. Diabetics may look pale, may suffer from anaemia, constipation, itching around the genital organs, palpitation and general weakness, drowsiness and lower sex urge than a normal

person. Tingling, numbness, calf muscle pain, frequent skin infections with candida, the fungus that inhabit vagina and alimentary tract or pus forming organisms may herald the disease.

In the present study majority (57.3%) of the subjects experienced extreme fatigue followed by polydipsia (excessive thirst) (44.0%), polyurea (excessive urination) (35.7%), polyphagia (excessive hunger) (32.0%), loss of weight (22.7%), joint pain (16.3%) and giddiness (13.7%). A small number of them reported body pain (9.3%), muscle cramps (8.0%), palpitation (5.7%), loss of appetite (4.7%), numbness (4.0%) also breathlessness (2.7%), and chest pain (2.7%).

During the post-diagnostic period a drastic reduction in most of the prominent symptoms likes polydipsia (44.0% to 4.0%) polyuria (35.7% to 5.0%) and polyphagia (32.0% to 3.3%) has been observed. Reasonable improvement in body weight, appetite and fatigue was also reported. Whereas some of the symptoms in the pre-diagnostic period like chestpain (2.7% to 10.3%), breathlessness (2.7% to 15%), and palpitation (5.7% to 15.7%) showed a spectacular increase, which need to be considered seriously. Numbness, muscle cramps, joint pain and body pain were the other symptoms that reported an increase in the post-diagnostic period . This might be age related, yet an attention on these lines would help to improve the general wellbeing of the patients.

Blood picture

Blood glucose - FPG level:

Table: 28. Distribution of respondents based on blood glucose -FPG level

*Blood glucose -FPG mg/dl	Male(n=150)	Female(n=150)	Pooled(n=300)
	Frequency	Frequency	Frequency
Normal (80-110)	10 (6.7)	8 (5.3)	18 (6.0)
Borderline (111-125)	18 (12.0)	6 (4.0)	24 (8.0)
Diabetic (>125)	122 (81.3)	136 (90.7)	258 (86.0)

*WHO (1999)

(Numbers in parentheses indicate percentages)

It is clear from the table that the fasting blood glucose level of six percent of the diabetic patients were under the normal range of 80 to 110 mg/100ml. Eight percent of them still had the borderline (111 to 125 mg/dl) of blood sugar level indicating risk. While 86 percent, a sizable majority, reported having fasting blood sugar level on a higher side (>125 mg/dl) indicating uncontrolled diabetes, inspite of the treatment.

Gender wise analysis showed that more women (90.7%) had FPG level above 125 mg/dl; whereas borderline cases were more among men (12%) than women (14%), 86 percent of the sample still having very high FPG level (>125 mg/dl) was a matter requiring immediate attention as they have less control on the metabolic risks of diabetes.

Blood pressure

Table: 3. Distribution of respondents based on blood pressure

Blood pressure (mm of Hg) (Systolic/Diastolic)	Male (n=150)	Female(n=150)	Pooled(n=300)
	Frequency	Frequency	Frequency
*cut-off value			
Normal (<140/<90)	102 (68.0)	78 (52.0)	180 (60.0)
High (>140/>90)	48 (32.0)	72 (48.0)	120 (40.0)

*Ref: (JNC VI, 1997)

(Numbers in parentheses indicate percentages)

As seen from the above table, 60 percent of the subjects recorded normal BP level. Comparatively more number of male diabetics (68%) than female (52%) had normal range of systolic and diastolic pressure. High blood pressure (systolic >140 and diastolic >90 mm of Hg) was reported by 40 percent of the subjects including 48 percent

of female and 32 percent male.. The same trend, female diabetic patient having higher BP level than their male counterparts (72.3% vs. 62.4% respectively) has been reported by Nolan et al. (2011). In contradiction to this, Vijayakumar et al. (2009) observed hypertension slightly on a higher side among males; in their studies in Alappuzha district of Kerala.

However, the overall prevalence of high BP among diabetic patients as reported by Ramachandran et al. (2002) was 38 percent, Vijayakumar et al. (2009) 30 percent and Gautam et al. (2009) 30.8 percent. But a very high prevalence of 75 percent was observed in a study conducted by Malini et al. (2009).

The association of diabetes with hypertension has been well established as given by Arauz-Pacheco et al. (2002) they coexist in approximately 40 to 60 percent of diabetic patients. Diabetics subjects have a 1.5 to 3 times increased prevalence of hypertension compared to non-diabetics (Arauz-Pacheco et al., 2004; Arauz-Pacheco et al., 2002), with 50 percent of adults with diabetes having hypertension at the time of diagnosis (Klein et al., 1996).

Vaz et al. (2011) further stated that individuals with blood pressure above 130/80 mmHg were 20 times more likely to have diabetes than those with lower blood pressure (OR 20.13; 95% CI 12.87 to 31.54). This further explained the two- way relation of diabetes and hypertension.

Therefore as emphasised by Resnick et al. (2006) failure to maintain blood pressure values less than 130/80mmHg, is a clear indication of poor management of diabetes or inefficiency in the control of all other components/risk factors associated with diabetes.

Blood Cholesterol

Serum cholesterol level within the desirable limit (<200 mg/100ml) was reported by 59.3 percent of the subjects studied, in more men than women. Borderline risk was observed among 28.7 percent of the subjects and a higher risk of above 240 mg/100ml serum cholesterol level was noticed among 12 percent (fig.2).

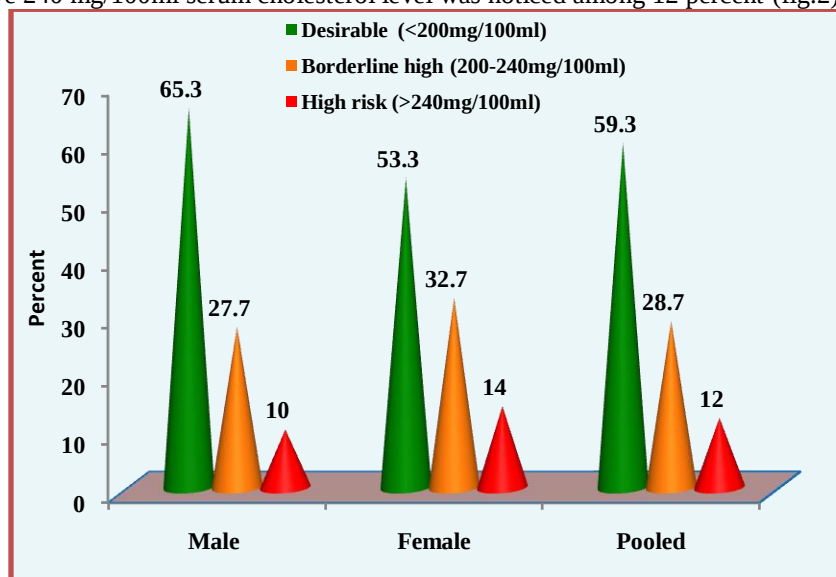


Fig.1. Serum cholesterol level of respondents

Cholesterol level of women diabetic exceeded that of men, in both borderline as well as high risk groups, indicating that female diabetics were on a higher risk than male. This finding was in line with the study reported by Vijayakumar et al. (2009) stating that 37 percent of diabetic patients in Alappuzha district of Kerala had hypercholesterolemia in which female patients exceeded men. Higher risks of hypercholesterolemia especially among the patients undergoing treatment for diabetes were strong indicators of inappropriate diabetic management.

Prabhakaran et al. (2007) reported an association between diabetes and hypercholesterolemia and hypertriglyceridemia among north Indian men. Yet another study by Vaz et al. (2011) also showed high cholesterol (OR 15.63; 95% CI 0.29 to 26.34) and triglyceride levels (OR 17.81; 95% CI 10.60 to 29.99) as significant factors associated with diabetes.

Conclusion`

- In the present study majority (57.3%) of the subjects experienced extreme fatigue followed by polydipsia (excessive thirst) (44.0%), polyurea (excessive urination) (35.7%), polyphagia (excessive hunger) (32.0%), loss of weight (22.7%), joint pain (16.3%) and giddiness (13.7%). During the post-diagnostic period a drastic reduction in most of the prominent symptoms likes polydipsia (44.0% to 4.0%) polyuria (35.7% to 5.0%) and polyphagia (32.0% to 3.3%) has been observed
- Numbness, muscle cramps, joint pain and body pain were the other symptoms that reported an increase, in the post-diagnostic period.
- Fasting blood glucose level in six percent of the diabetic patients were under the normal range of 80 to 110 mg/100ml. Eight percent of them still had the borderline (111 to 125 mg/dl) of blood sugar level. While 86 percent, a sizable majority, were reported having fasting blood sugar level on a higher side (>125mg/dl). Gender-wise analysis of fasting blood glucose showed that more women (90.7%) had FPG level above 125mg/dl; whereas borderline cases were more among men (12%) than women (14%).
- With regard to blood pressure, 60 percent of the subjects recorded normal BP level. Serum cholesterol level within the desirable limit (<200 mg/100ml) was reported in 59.3 percent of the subjects. Borderline risk was observed among 28.7 percent of the subjects and higher risk of above 240 mg/100ml serum cholesterol level was noticed among 12 percent. Cholesterol level of women diabetic exceeded that of men.
- Regarding complications of diabetes, polyneuropathy (23%) and retinopathy (23%) were the major ones, observed among the subjects. More male (16%) than female (5.3%) were affected by CVD, whereas kidney problem was seen more among females (14%) than males (10.7%). So also foot amputation (female: 11.3% and male: 10%).
- Gestational diabetes among the diabetic women was reported to be 11.04 percent and stillbirth 11.0 percent. 83.44 percent of the mothers gave birth to low- birth-weight babies (<2.5 kg). Only 9.65 percent of such mothers had babies with normal weight of 2.5 to 3.5 kg and 6.89 percent babies weighed above 3.5 kg at birth.

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