Research Article

Diabetes and quality of life—a pilot study

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Abstract

Background: India is regarded as the "Diabetes Capital" of the world owing to the existence of the largest number of people with diabetes in this country. Diabetes is a serious public health problem that has a strong negative impact on the health-related quality of life (HRQoL).

Objective: To know the quality of life (QoL) of diabetic persons and compare them with normal subjects.

Materials and Methods: This cross-sectional study was done among 85 diabetic patients and 85 age- and sex-matched normal comparison group. We used the World Health Organization Quality of Life Questionnaire—short version (WHOQoL-BREF) to assess QoL.

Result: The mean QOL-BREF instrument score, indicating the QoL of the patients, was 57.80. Domain-wise, 55% of the patients revealed good physical QoL, 47% good psychological QoL, 55% good social QoL, and 45% good environmental QoL. The mean score of physical domain of diabetic patients was significantly lower than nondiabetic subjects.

Conclusion: This study has shown that the physical domain of QoL was significantly affected in diabetic persons. So, apart from taking regular medications and health checkup, there is a need to address other components of physical domain so that their QoL will improve. While it might not be easy to modify clinical outcomes with good services and support, it might be much more effective in bringing a change in QoL.

KEY WORDS: Quality of Life, diabetes mellitus, WHOQoL-BREF

Introduction

In the twenty-first century, we see more globalization and industrialization, longer life spans, and changes in lifestyles worldwide. A consequence of these changes will be shifts in the patterns of disease, with chronic diseases such as diabetes becoming more prevalent.[1] Data published by the WHO in 2014 indicated that the global prevalence of diabetes was close to 10% among adults aged 18 years and older.[2] India is regarded as the "Diabetes Capital" of the world owing to the existence of the largest number of people with diabetes in this country. The International Diabetes Federation estimated that the number of diabetic patients in India has doubled between 1995 and 2005, and, by 2025, it would reach a figure of about 70 million.[3,4] Recently published data reveal that the age-standardized prevalence of total diabetes (previously diagnosed and previously undiagnosed diabetes) ranges from 8% to 18% in urban India and 2.4% to 8% in rural India.[5]

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The WHO defines quality of life (QoL) as "an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns."[6] In measuring QoL, therefore, the WHOQoL group takes the perspective that it is significant to be aware of how contented or disturbed people are by essential features of their life, and this analysis will be a highly individual matter.

Diabetes is a serious public health problem that threatens the QoL. Hyperglycemia revealed a pathogenic role in microvascular diseases (nephropathy, retinopathy, and neuropathy) and accelerates macrovascular complications [cardiovascular disease (CVD) such as stroke and coronary heart disease] associated with diabetes. In fact, CVD is the leading cause

of premature death among individuals with diabetes.[7] People with chronic disease, such as type 2 diabetes, have to face many problems, which may pose an impact on their health-related quality of life (HRQoL). Several studies have demonstrated that diabetes shows a strong negative impact on the HRQoL, especially in the presence of complications.[8–13] Taking all this into account, the study was planned with an objective to know the QoL of diabetic persons and compare them with normal subjects.

Materials and Methods

This cross-sectional study was conducted in the months of March and April 2013 in diabetic camps organized at All India Institute of Medical Sciences, Patna, Bihar, India. The random blood glucose level of all the persons was measured with the help of glucometer. The persons with abnormally raised blood glucose levels were again called on the next day for fasting blood glucose level measurement. The persons with raised fasting blood glucose level were considered diabetic cases. The persons with controlled diabetes owing to oral hypoglycemic medications were also considered as diabetic cases. The apparently normal persons with normal blood glucose levels were taken for comparison. Finally, a total of 85 persons presenting diabetes mellitus and 85 age- and sex-matched nondiabetic subjects were enrolled in the study.

QoL was assessed using Hindi version of WHOQoL-BREF.[14] The questionnaire on QoL was translated in Hindi and pretested. The questionnaire comprised a total of 26 questions pertaining to four domains, viz., physical, psychological, social, and environmental. The physical domain included questions pertaining to pain, energy, sleep, work, and activities. Questions in psychological domain were on positive and negative feelings and body image. Social domain included questions pertaining to personal relationships and social support. Questions in environmental domain were on home and work environment and satisfaction regarding facilities such as transport, health, living, and financial arrangements. The respondent was asked to reply these questions as perceived by them on a five-point scale, wherein a score of five was for the most positive response.

Data entry and statistical analysis were done by using SPSS software, version 22. The four domains of the WHOQoL-BREF: physical health, psychological, social relationships, and environment, were rated on a five-point Likert scale.[14] As per the WHO user manual, raw scores for the domains of WHOQoL-BREF were calculated by adding values of single items and were transformed on the scale ranging from 0 to 100, where 100 is the highest and 0 is the lowest QoL. Mean score of each domain and the total score were calculated. The first two questions in the WHOQoL-BREF were taken together for the analysis of perceived QoL. Individuals with mean scores above the mean of total score were classified as showing good QoL and below that as poor QoL.[15] The χ^2-test and independent *t*-test were applied to observe the statistical significance. The purpose of the study was explained, and informed consent was obtained from all the participants before their enrolment. The study was approved by institutional ethical committee.

Result

A total of 85 persons presenting diabetes mellitus and 85 age- and sex-matched nondiabetic persons were enrolled in the study. The mean age for diabetic persons was 49.5 years, while for nondiabetic persons 48.8 years. History of regular cigarette smoking (current and past) was present in 50.6% diabetic cases while only 25.9% in nondiabetic persons. History of regular alcohol intake (current and past) was present in 38.8% diabetic persons while only 20% in nondiabetic persons. History of regular exercise and physical activities was present in only 32.9% of diabetic persons while it was present in 48.2% of nondiabetic persons. Family history of diabetes was present in 35.3% of diabetic persons but only in 31.8% of nondiabetic persons [Table 1].

Most of the diabetic cases (56.5%) rate their QoL as an average. Only 32.9% of diabetic cases had rated their overall QoL as good, while 52.9% nondiabetic persons had rated their QoL as good, and this relation was statistically significant. About 28.2% of diabetic persons were unsatisfied with their general health, while only 14.1% nondiabetic persons were unsatisfied; 31.8% of diabetic persons were satisfied while 39.4% nondiabetic persons were satisfied, and this relation was statistically significant [Table 2].

The QoL of diabetic persons was poor in all the domains (physical, psychological, social, and environmental) in comparison with nondiabetic persons. The mean score of physical domain of diabetic persons was very less in comparison with nondiabetic persons, and this association was significant ($p < 0.005$) [Table 3].

The QoL scores were further converted into categorical variable by obtaining the mean score of domain and dividing the group into those who got a score above the mean and those below the mean. They were labeled as good and poor QoL as shown in Table 4. About 75.3% nondiabetic persons showed good QoL in physical domain, while only 55.3% diabetic persons showed good QoL in physical domain, and this association was statistically significant [Table 4].

Discussion

One of the major risk factors for microvascular complications is smoking. It has been reported that hypertension and smoking interact to increase the risk of diabetic complications, including stroke and heart disease.[16] In our study, at the diagnosis of the disease, 50.6% of patients were smokers. A similar high prevalence of smoking (41.6%) was reported by Aghamollaei et al.[17]

Exercise is another important part of managing diabetes because it improves insulin action in both types of disease (type 1 and type 2). A regular program of physical activity

Table 1: General characteristics of study subjects

Variables	Diabetic subjects (*n* = 85)	Nondiabetic subjects (*n* = 85)	Total (*N* = 170)
Age (years)			
18–30	14 (16.5)	13 (15.3)	27 (15.9)
31–59	45 (52.9)	47 (55.3)	92 (54.1)
≥60	26 (30.6)	25 (29.4)	51 (30.0)
Mean age + SD	49.5 ± 15.54	48.8 ± 14.67	
Gender			
Male	71 (83.5)	73 (85.9)	144 (84.7)
Female	14 (16.5)	12 (14.1)	26 (15.3)
History of cigarette smoking			
Present	43 (50.6)	22 (25.9)	65 (38.2)
Absent	42 (49.4)	63 (74.1)	105 (61.8)
History of alcohol intake			
Present	33 (38.8)	17 (20.0)	50 (29.4)
Absent	52 (61.2)	68 (80.0)	120 (70.6)
Regular exercise			
Present	28 (32.9)	41 (48.2)	69 (40.6)
Absent	57 (67.1)	44 (51.8)	101 (59.4)
Family history of diabetes			
Present	30 (35.3)	27 (31.8)	57 (33.5)
Absent	55 (64.7)	58 (68.3)	113 (66.5)

Table 2: Overall perceptions about QoL and health

	Diabetic subjects, *n* (%)	Nondiabetic subjects, *n* (%)	Total, *N* (%)	χ^2	*P*
Overall QoL					
Bad	9 (10.6)	12 (14.1)	21 (12.4)	9.651	0.008
Average	48 (56.5)	28 (32.9)	76 (44.7)		
Good	28 (32.9)	45 (52.9)	73 (42.9)		
Overall general health					
Unsatisfied	24 (28.2)	12 (14.1)	36 (21.2)	6.537	0.038
Neutral	34 (40.0)	33 (38.8)	67 (39.4)		
Satisfied	27 (31.8)	40 (47.1)	67 (39.4)		

Table 3: Scoring pattern of QoLof diabetic cases and nondiabetic control subjects

Domain	Diabetic subjects	Nondiabetic subjects	*t*	*P*
	Mean (SD)	Mean (SD)		
Physical	58.84 (18.43)	66.40 (13.41)	3.06	0.003
Psychological	58.20 (18.83)	62.68 (15.73)	1.68	0.094
Social	63.20 (20.89)	64.20 (15.84)	0.35	0.725
Environmental	50.95 (12.31)	51.84 (11.72)	0.483	0.629
Total	57.80 (15.53)	61.32 (11.04)	0.513	0.609

Table 4: Categories based on QoL scores

Domain	Diabetic subjects		Nondiabetic subjects		χ^2	*P*
	Poor	Good	Poor	Good		
Physical	38 (44.7)	47 (55.3)	21 (24.7)	64 (75.3)	7.502	0.006
Psychological	45 (52.9)	40 (47.1)	39 (45.9)	46 (54.1)	0.847	0.357
Social	38 (44.7)	47 (55.3)	38 (44.7)	47 (55.3)	0.00	1.00
Environmental	47 (55.3)	38 (44.7)	50 (58.8)	35 (41.2)	0.22	0.639
Total	43 (50.6)	42 (49.4)	33 (38.8)	52 (61.2)	2.380	0.123

helps reduce body weight and decrease glucose intolerance and the occurrence of complications.[16] In spite of the importance of exercise, only 32.9% of our diabetic patients exercised regularly.

Eljedi et al.[8] analyzed the HRQoL in a sample of diabetic patients living in refugee camps in the Gaza strip in comparison with gender- and age-matched nondiabetic control persons from the same camps. Diabetes and its complications affected negatively all of the domains of the WHOQoL-BREF; however, the effects were the strongest for the physical health and psychological domains and weaker for the social relationships and environment domains, similar to this study. In this study, both groups showed particularly low scores in the environmental domain indicating the bad environmental conditions affecting HRQoL of diabetic patients and controls in a similar way, as also found by Eljedi et al.

In a Danish validation study of the WHOQoL-BREF, the mean scores were considerably higher for all the domains in diabetic patients (between 70 and 76 points) when compared with our sample (58 to 63), but only slightly higher for control subjects (74 to 89 vs. 51 to 66) with the exception of the environment domain, where the score in our sample was much lower (80 vs. 51).[18] In the Iranian study, the scores for the diabetic patients were lower than in the Danish study (55 to 65), which was almost similar to this study.[18]

The mean QoL-BREF instrument score, indicating the QoL of the patients, was 57.80, which was similar to the study by Manjunath et al.[15] in rural south India (58.03). Keeping the mean as the cutoff, the QoL scores were converted into categorical variables. Domain-wise, 55% of the patients showed good physical QoL, 47% good psychological QoL, 55% good social QoL, and 45% good environmental QoL. Manjunath et al., in their study, reported that 63% showed good physical QoL, 69% good psychological QoL, 27% good social QoL, and 85% good environmental QoL. In this study, a lower score in environmental domain was reported in both groups. This may be because of the facets measured in the WHOQoL-BREF instrument pertaining to environmental QoL such as availability of money, condition of living place, access to health care, and transport facilities. The fact that the patients were mainly from the rural background with poor facet parameters could influence this result.

Because the data were collected from a diabetic camp, so, we were unable to collect more sociodemographic variable; therefore, we did not do the multivariate analysis for observing which variables show effect over QoL.

Conclusion

This study has shown that the physical domain of QoL was significantly affected in diabetic persons. The physical domain consists of activities of daily living, dependence on medicinal substances and medical aids, energy and fatigue, mobility, pain and discomfort, sleep and rest, and work capacity. So, apart from taking regular medications and health checkup, there is a need to address other components of physical domain so that their QoL will improve. While it might not be easy to modify clinical outcomes with good services and support, it might be much more effective in bringing a change in QoL. Thus, QoL measurements should become a routine part of clinical management of diabetic patients.

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