

**QUALITY OF LIFE CONSEQUENCES IN DIABETIC POLYNEUROPATHY****Niranjan Y<sup>1\*</sup>, Santwani M A<sup>2</sup>, Baghel M S<sup>3</sup>**

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Received: 10/06/2012; Revised: 28/06/2012; Accepted: 05/07/2012

**ABSTRACT**

Quality of Life (QoL) is an important outcome of healthcare measures. It is an emerging domain of interest which measures the missing dimension of health especially in chronic disabling conditions like Diabetic Polyneuropathy. This study focuses on the QoL issues among Diabetic Polyneuropathy which form a considerable portion among diabetics. A total of 60 diabetics were surveyed; those without and with symptomatic distal sensory motor Polyneuropathy. QoL was assessed using WHO QoL (World Health Organization Quality of Life) - BREF scale to understand the consequences of Polyneuropathy on domains of QoL. The data is analyzed using student's t test for independent samples. Patients with Polyneuropathy expressed overall lower levels of Quality of life as measured with the WHO QoL BREF scale compared with that of plain diabetic controls.

**KEY WORDS:** Diabetic Polyneuropathy; Quality of Life; WHO QoL BREF

## INTRODUCTION

Quality of life (QoL) is defined as individual's perceptions 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<sup>1</sup>. QoL refers to a subjective evaluation which is embedded in a cultural, social and environmental context. Ayurveda gives immense magnitude for the improvement and assessment of QoL as an outcome of treatment. Charaka<sup>2</sup>, while describing the criteria of assessment of outcomes of therapy, has described four quartets (*Chatuhshreyah*) in which first is the effect of therapy on the disease but all other three i.e., *Agni* (Digestive power), *Dehabala* (Physical strength) and *Satwabala* (Mental strength) are predominantly concerned with the QoL. It is emerging as a new domain of interest among the recent research especially in treatment of chronic disabling conditions such as Diabetic Polyneuropathy.

Charaka clearly defines the motto of treatment being restoration of equilibrium of bodily elements and there by achieving perfect quality of life in terms of alleviation of pain, accession of voice and complexion, plumpness of the body, increase of strength, desire for food, relish while eating, timely and proper digestion of the food taken, approach of the sleep at proper time, not seeing frightful dreams (that forebode disease), happy awakening, the elimination of flatus, urine, feces and semen, and freedom from impairment of any kind of the mind, the intellect, and the sense organs. The fruit of action is the attainment of happiness<sup>2</sup> (*Sukhavapti*). Its characteristics are satisfaction of the mind, intellect, senses and the body.

The quality of life (QoL) measurements are increasingly being used in assessing the treatment outcomes in these conditions<sup>3</sup> as they measure the missing dimensions of healthcare. Diabetes is a metabolic illness requiring regular medications and ability on the part of patient to monitor and modify diets and lifestyle. The QoL afflictions in diabetes is well documented

in previous studies<sup>3,4,5</sup> but all are broad studies involving patient oriented questionnaire based where there is a high rate of bias due to subjective perception of life and illness and also the patient awareness towards the disorder. The previous studies<sup>6</sup> included both type I and type II diabetes mellitus whereas current research is focused on type II diabetes mellitus.

Peripheral neuropathy affects about 30% of people with diabetes mellitus. Among them, 16% to 26% experience chronic pain<sup>7,8</sup>. Chronic painful symptoms have considerable detrimental effects on individual's life and may be associated with anxiety, dejection, depression, morbidity and dependence along with causing financial burden. Most measures of health status represent local perceptions and understanding of the disease which may not be suitable for Indian scenario. Most, measure the effect of disease or health status, mental state and not promoting holistic approach to health and health care. Hence in this study the authors have aimed at assessing the QoL using a widely accepted WHO QoL – BREF<sup>9</sup> scale which has been extensively researched, validated<sup>9</sup> and being quite simple for administration.

This study focuses on the QoL issues among type II diabetics with and without additional neuropathy which form the majority of the population in developing countries like India. The outcomes of this study will be useful among the researchers and also the state health departments in designing or exploring future remedies and for prevention strategies along with construction of suitable rehabilitation measures.

### Aims and objectives:

The objective of the present study was to determine the relationship between quality of life and diabetic neuropathy using WHO QoL BREF scale.

## MATERIALS AND METHODS

Sixty patients were recruited randomly based on incidence in the study from outpatient department of Kayachikitsa, Institute for Post Graduate Teaching and Research in Ayurveda,

Gujarat Ayurved University, Jamnagar. All were previously diagnosed with Type II diabetes mellitus and were on various oral drug regimens; among them 30 had symptomatic diabetic peripheral sensorimotor Polyneuropathy and an equal number had no additional Polyneuropathy. Diabetic Polyneuropathy is a diagnosis of exclusion<sup>10</sup>, hence presence of neuropathy was established by Neuropathy Symptom Score<sup>11</sup> (NSS) and Neuropathy Disability Score<sup>11</sup> (NDS) which includes evaluation of ankle reflexes, vibration perception threshold using 128 Hz tuning fork, pin prick, thermal sensitivity and 10 g monofilament testing. Additionally detailed history, clinical examinations were done to confirm the diagnosis of Diabetic Polyneuropathy. The severe form of neuropathy in stage N3 of Dyck' staging<sup>12</sup> were excluded from the study looking in to the fragility of the condition.

International Association for the Study of Pain defines Neuropathic pain as 'Pain caused by a lesion or disease of the somatosensory nervous system'<sup>13</sup>. In all types of neuropathic pain there is a combination of sensory loss giving rise to negative signs and pain, causing a variety of positive symptoms and signs<sup>14</sup>. All the selected subjects with neuropathy, presented with either positive or negative symptoms. Negative symptoms like numbness, loss of balance or positive ones like burning pain, prickling pain, tingling, electric shock-like, aching, tightness, hyperesthesia and allodynia often with nocturnal exacerbations were observed.

Quality of Life was assessed using the WHO QoL BREF scale. WHO BREF is an international cross-culturally comparable quality of life assessment instrument which assesses the individual's perceptions in the context of their culture and value systems, and their personal goals, standards and concerns. WHO QoL BREF was administered in an interview and assistance was provided whenever necessary.

The study was approved by Institutional Ethics Committee of the institute vide PGT/7/

Ethics/2009-2010/3494 and registered in Clinical Trial Registry of India (CTRI) under registration no. CTRI/2011/07/001885. The data obtained was analyzed statistically using Sigmasat 3.5 Software. Student's 't' test for independent samples was used to analyze the two groups of patients, viz, those without neuropathy and with neuropathy. Levels of  $p < 0.05$  were accepted as the level of Significance.

## OBSERVATIONS AND RESULTS

Basic demographic data of the two study groups i.e., diabetes without and with Polyneuropathy are given in Table No.1. Global perception of QoL and health along with domain scores for physical, social, psychological and environmental domains are also shown in Table no.1. The subjects studied were belonging to the age group of 35–70 years, among them 31 were males and 29 were females. Mean duration of diabetes in first group was 6.46 years and in second group, it was 9.48 years. The mean of last Fasting blood glucose levels as ascertained by the history was 186.8 mg/dl and 184.37 mg/dl. According to the drug regimen, 20 patients were using Ayurvedic drugs for diabetes and 40 were on allopathic oral hypoglycemic agents.

In WHO QoL, the lower the percentage scores the lower the quality of life and vice versa. The subjects with presence of Polyneuropathy opined lower quality of life ( $t = 5.426$ ;  $df = 58$ ;  $P = < 0.001$ ) and health ( $t = 5.769$ ;  $df = 58$ ;  $P = < 0.001$ ). In the questions one and two assessing the global perception of one's quality of life and health, the patients of neuropathy opined reduced scores of mean 3.33 and 2.83 respectively which was far lower than that of diabetic controls (Table No.1). The subjects with neuropathy showed statistically highly significant decrease in QoL in physical domain (Domain 1) which includes daily activity, energy and pain with mean  $60.13 \pm SD 6.64$  ( $t = 8.609$ ;  $df = 58$ ;  $P = < 0.001$ ). In domain 2, which includes psychological feelings and self esteem, the subjects in group 2 had statistically highly significant reduction in QoL owing to

the presence of Polyneuropathy where 't' value was 7.683 (df = 58; P = < 0.001). In domain three incorporating personal and social relationships and sexual activity, the people with neuropathy showed highly significant reduction in QoL (t = 11.634; df = 58;

P = < 0.001). Financial security, health care and environment of living were included in domain 4 wherein too, people with Polyneuropathy fared statistically highly lower quality of life (t = 8.692; df = 58; P = < 0.001).

**Table No.1 Depicting demographic details and QoL of studied cases**

	Diabetes without Neuropathy N= 30 Men= 14 ( 46.7%); Women= 16 (53.3%)		Diabetes with Neuropathy N= 30 Men= 17 (56.7%); Women= 13 (43.3%)	
	Mean ± SD*	Max–Min	Mean ± SD*	Max–Min
Age (in Years)	53.9 ± 8.26	70–38	57.77 ± 7.08	68–37
Duration of Diabetes (in Years)	6.46 ± 4.17	15–0.25	9.48 ± 5.69	20–0.3
Last blood sugar reading (in mg/dL)	186.8 ± 59.12	399–130	184.37 ± 45.64	270–113
Drug regimen for Diabetes	13 (43.3%) - Ayurveda 17 (56.7%) - Allopathic		07 (23.3%) - Ayurveda 23 (76.7%) - Allopathic	
Global perception of QoL <sup>s</sup>	4.1 ± 0.40	5–3	3.33 ± 0.66	4–3
Global perception of health <sup>ss</sup>	3.6 ± 0.5	4–3	2.83 ± 0.53	4–2
Physical health <sup>#</sup>	78.17 ± 9.36	94–50	60.13 ± 6.64	75–44
Psychological <sup>##</sup>	81.5 ± 9.24	94–69	62.67 ± 9.75	81–44
Social relationships <sup>###</sup>	93.63 ± 7.48	100–75	67.03 ± 10.05	94–44
Environment <sup>####</sup>	86.7 ± 7.65	94–75	67.83 ± 9.1	81–44

\*SD – Standard Deviation, <sup>s</sup> t = 5.426, <sup>ss</sup> t = 5.769, <sup>#</sup> t = 8.609, <sup>##</sup> t = 7.683, <sup>###</sup> t = 11.634, <sup>####</sup> t = 8.692

## DISCUSSION:

Quality of Life has been studied using a variety of measures in people with Diabetes. Benbow et al.<sup>15</sup> opine that diabetic patients with peripheral neuropathy reported lower levels of quality of life in comparison to uncomplicated diabetes and a normal control group. But the results have been inconsistent, with several studies reporting little or no disruption, while others report a considerable impact on QoL<sup>16</sup>.

The study included subjects of age group 35–70 years, mean age of diabetic neuropathy group was 57.77 years. The subjects with Polyneuropathy had diabetes for an average of 9.48 years and those with uncomplicated diabetes have given the shorter diabetes history of 6.46 years. This proves the fact<sup>17</sup> that the duration of diabetes also plays an important role in the development of Polyneuropathy. But the last blood sugar reading ascertained by history gave contradictory finding as the readings were nearly same (186.8 and 184.37 respectively). This may be because of the fact that, the readings were based on patient's statement and may not be the actual value.

For the first question of the questionnaire, regarding their perception of global QoL, mean 3.33 and 4.1 was the score in neuropathics and non-neuropathics respectively. Majority of the subjects with neuropathy had reduced perception of health than that of those with uncomplicated diabetes (Mean 2.83 and 3.6 respectively). Since the study was conducted on symptomatic peripheral sensorimotor Polyneuropathy, the positive and negative feelings of neuropathy pose constant trouble to the daily activities including recreation and sleep. In the domains of Physical health, which includes activities of daily living, dependence on medicines, energy and fatigue, mobility, pain and discomfort, sleep and rest, work capacity the people with Polyneuropathy scored far less, mean being 60.13 compared with that of 78.17 in the diabetics. In the domain 2

comprising of psychological factors like bodily image and appearance, negative feelings, positive feelings, self-esteem, spirituality, thinking, learning, memory and concentration, the people said reduced quality of living (mean 62.67 and 81.5 respectively) due to obesity and loss of concentration in selected patients. Third domain consisted personal, sexual life wherein the reduced quality probably attributable to diminished libido and sexual performance; a well documented complication of diabetes. Fourth domain consists of financial resources freedom, physical safety and security, accessibility and quality of health and social care, home environment, opportunities for acquiring new information and skills, participation in and opportunities for recreation / leisure activities, physical environment (pollution / noise / traffic / climate) and transport. Here too the presence of Polyneuropathy caused marked decline in quality attributable to the disease.

This study supports the opinion that the presence of Polyneuropathy along with diabetes significantly reduces the quality of life than that of uncomplicated diabetes. The subjective assessment of QoL becomes important especially in developing nations like India, deciding the physician visits and adherence to strict dietary, exercise and drug regimen. Diabetes being a chronic illness, the understanding of one's illness demonstrates better coping to the disease and better outcome in terms of treatment, as the final motto of treatment is to provide a better QoL (*Sukhavapti*).

## CONCLUSION:

Patients with Polyneuropathy express overall lower levels of Quality of life as measured with the WHO QoL BREF scale compared with that of plain diabetic controls. The patients also opine that their overall life is being severely affected by the presence of Polyneuropathy.

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Source of Support: Nil

Conflict of Interest: None Declared