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CORRELATIONS BETWEEN DIABETIC NEPHROPATHY AND LIFE QUALITY IN A STUDY GROUP OF TYPE 2 HOSPITALIZED DIABETIC PATIENTS

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Correlations between Diabetic Nephropathy and Life Quality in a Study Group of Type 2 Hospitalized Diabetic Patients

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Abstract

The aim of the study was to describe the relationship between quality of life and diabetic nephropathy and its interaction with glycaemic control, in diabetic persons. We examined 70 type 2 insulin-treated diabetic patients admitted in Department of Diabetes, Nutrition and Metabolic Disease. There was assessed diabetic nephropathy 90 (by detecting 24 hours microalbuminuria) and glycaemic control (by detecting HbA1c). Life quality was evaluated by applying Quality of Life Index (QLI) – Diabetes III Version questionnaire. Five scores were calculated for the Ferrans and Powers Quality of Life Index. Diabetic nephropathy was diagnosed in 40% of patients. 11.4% diabetic patients had good glycaemic control (HbA1c < 7%). Quality of life overall score didn't correlate with body mass index (BMI) (p=0,442) or HbA1c (p=0.28). Good glycaemic control didn't influence the quality of life and its subscales in examined patients. Diabetics with good glycaemic control had a slightly higher score on the social and economic subscale (p=0,051). QoL was not favorable in diabetic patients. QOL in diabetic patient with nephropathy should be improved by common effort of diabetes team.

Keywords: diabetes, quality of life, diabetic nephropathy.

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Introduction

The Quality of life (QoL) represents the effect of an illness on patient, as perceived by the person (Rubin & Peyrot 1999). The majority of studies showed a moderate impact of diabetes complications on quality of life (HRQOL) among diabetic patients compared with non-diabetic controls (Wandell, 2005; Levey *et al.*, 2007). Diabetic nephropathy is a serious kidney-related complication of diabetes, also called diabetic kidney disease which affects the ability of kidneys to do their usual work of removing waste products and extra fluid from whole body. The best way to prevent or delay diabetic nephropathy is by maintaining a healthy lifestyle and treating diabetes and high blood pressure. Kidney disease may progress to kidney failure, also called end-stage kidney disease. Kidney failure is a life-threatening condition. At this stage your treatment options are dialysis or a kidney transplant (American Diabetes Association, 2017).

Considering these problems, is easy to make sense that patients with diabetic nephropathy are affected by a great number of emotional problems, induced by advanced kidney disease, when patients need periodic dialysis to survive (De Los Rios *et al.*, 2005a). Chronic kidney disease is recognised as a major global public health problem that affects 10–16% of the adult population in Asia, Australia, Europe, and the USA and increases the risk of all-cause mortality (Levey *et al.*, 2007). Microalbuminuria is considered a marker of incipient nephropathy in people with diabetes, and, thus, screening for microalbuminuria is performed routinely in people with type 1 and type 2 diabetes. Microalbuminuria refers to urinary albumin excretion between 30 to 300 mg of albumin in a 24-hour urine sample or an albumin/creatinine ratio (ACR) of 0.03 to 0.3 in a random urine sample, preferably the first morning void (Yamamoto *et al.*, 2014; Martin, 2011). The aim of the study was to describe the relationship between quality of life, diabetic nephropathy and glycaemic control in diabetic patients.

Material and methods

We examined 70 type 2 insulin-treated diabetic patients admitted in Department of Diabetes, Nutrition and Metabolic Disease. There was determined 24 hours microalbuminuria and HbA1c level to assess diabetic nephropathy and glycaemic control. To quantify urinary albumin there was used immunoturbidimetry method. Life quality was evaluated by applying Quality of Life Index (QLI) – Diabetes III Version questionnaire. Five scores were calculated for the Ferrans and Powers Quality of Life Index: Total Quality of Life Score, Health and

functioning subscale score, Social and economic subscale score, Psychological/spiritual subscale score, and Family subscale score. For statistical processing of data there was used Statistical Package for Social Sciences version 13.0, (SPSS Inc., Chicago, IL, USA). Univariate ANOVA was used to determine the influence of glycaemic control and diabetic nephropathy on quality of life.

Results

The mean age of participants was 58.75±17.48 years old. Mean body mass index was 27.06±5.89 kg/m², while mean HbA1c was 10.83±3.29%. Diabetic nephropathy was diagnosed in 40% of diabetic patients. In 11.4% diabetic patients was found good glycaemic control (HbA1c < 7%). The association between diabetic nephropathy and quality of life scores is shown in *Table 1*.

Table 1. Association between diabetic nephropathy and quality of life scores

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Overall QOL	Yes	28	16.60	3.52	.66	15.23	17.96	10.93	22.49
	No	42	18.25	3.25	.50	17.23	19.26	9.94	24.41
	Total	70	17.59	3.43	.41	16.77	18.41	9.94	24.41
Health and functioning subscale score	Yes	28	16.06	3.99	.75	14.51	17.61	8.61	22.68
	No	42	18.15	3.52	.54	17.05	19.25	10.14	25.57
	Total	70	17.31	3.83	.45	16.40	18.23	8.61	25.57
Social and economic subscale score	Yes	28	16.72	4.26	.80	15.07	18.37	8.14	22.57
	No	42	17.86	3.94	.60	16.63	19.09	10.00	25.07
	Total	70	17.40	4.08	.48	16.43	18.38	8.14	25.07
Psychological/spiritual subscale score	Yes	28	15.37	4.83	.91	13.49	17.24	4.07	24.50
	No	42	17.75	4.28	.66	16.41	19.08	7.93	25.36
	Total	70	16.80	4.63	.55	15.69	17.90	4.07	25.36
Family subscale score	Yes	28	20.16	4.61	.87	18.37	21.95	9.00	27.80
	No	42	20.54	4.97	.76	18.99	22.09	7.90	27.30
	Total	70	20.38	4.80	.57	19.24	21.538	7.90	27.80

QoL overall score didn't correlate with body mass index (BMI) (p=0.442) or with HbA1c value (p=0.28). This relationship was noticed for patients with and without diabetic nephropathy (QoL and BMI, p=0.81, QoL and HbA1c, p=0.89), (QoL and BMI, p=0.24, QoL and HbA1c, p=0.13).

A good glycaemic control didn't influenced the quality of life and its subscales in examined patients.(QoL, $p=0.07$; Health and functioning subscale, $p=0.11$; Psychological/spiritual subscale $p=0.49$). The diabetics with a good glycaemic control had a slightly higher score on the social and economic subscale ($p=0.051$).

Table 2. The relation between the QoL subscales and the glycaemic control

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Overall QOL	Good	8	19.65	2.30	.81	17.72	21.58	16.99	22.49
	Poor	62	17.32	3.481	.44	16.44	18.21	9.94	24.41
	Total	70	17.59	3.43	.41	16.77	18.41	9.94	24.41
Health and functioning subscale score	Good	8	19.32	2.63	.93	17.12	21.52	16.39	22.68
	Poor	62	17.06	3.90	.49	16.06	18.05	8.61	25.57
	Total	70	17.31	3.83	.45	16.40	18.23	8.61	25.57
Social and economic subscale score	Good	8	20.05	1.88	.66	18.48	21.62	17.93	22.50
	Poor	62	17.06	4.17	.52	16.00	18.12	8.14	25.07
	Total	70	17.40	4.08	.48	16.43	18.38	8.14	25.07
Psychological/spiritual subscale score	Good	8	17.87	3.47	1.22	14.96	20.78	12.21	22.29
	Poor	62	16.66	4.76	.60	15.45	17.87	4.07	25.36
	Total	70	16.80	4.63	.55	15.69	17.90	4.07	25.36
Family subscale score	Good	8	23.73	3.73	1.32	20.60	26.85	16.17	27.80
	Poor	62	19.95	4.77	.60	18.74	21.17	7.90	27.30
	Total	70	20.38	4.80	.57	19.24	21.53	7.90	27.80

The effect of glycaemic control and diabetic nephropathy on quality of life was examined by means of univariate ANOVA. Patients with nephropathy and good glycaemic control had a better quality of life than those with nephropathy and poor metabolic control (20.89 vs.15.88). The same relationship was found in diabetics without nephropathy (18.41 vs.18.23). However, in our sample was no interaction effect between these parameters and quality of life ($p=0.051$).

Discussion

The quality of life seen through the perspective of health represents a measure of physical, mental and social well-being as a perception of each patient on different components of health (De los Rios *et al.*, 2005b). Diabetes and its complications affect people and family members' life in different ways: making lifestyle changes, taking steps to help prevent and treat complications, losing time

from school and work, paying for supplies and drugs (Huang *et al.*, 2007; Harris, Worrall, & Macauley, 2011).

In our study there were noticed significant differences in overall quality of life score between patients with and without diabetic nephropathy. Several studies proved that progression of diabetic nephropathy decreases HRQoL (Chenyang *et al.*, 2017). In another study, there was found that the lowest level of QoL was in patients with type 1 diabetes mellitus, with diabetic nephropathy at 3 stage of kidney chronic disease (Papazafiropoulou, 2015). Patients with type 1 diabetes 3 stages of kidney chronic disease had strongly reduced general health perceptions, role of physical functioning, and vitality (Jain *et al.*, 2014). Glycaemic control did not correlate with QoL. Some studies had shown a strong relation between proteinuria and QoL in diabetic patients with advanced nephropathy (Harris, Worrall, & Macauley, 2011; Huang *et al.*, 2007). Jain *et al.* (2014) found that diabetes and its complications affected negatively all of the domains of the WHOQOL-BREF. The effects were stronger for the physical health and psychological domains and weaker for the social relationships and environment domains (Kumar *et al.*, 2016). In our study, the interaction effect of nephropathy and glycaemic control on social and economic subscale score, Psychological/spiritual subscale score, and Family subscale score was not found. However patients with a good control had a better Psychological/ Spiritual subscale score (Huang *et al.*, 2007). In our study, patients without diabetic nephropathy and good glycaemic control had a better score than those with diabetic nephropathy and poor glycaemic control.

Conclusions

Diabetic kidney disease is a life threatening chronic complication which may deeply affect the quality of life in diabetic persons. In our study, QoL was not favorable in diabetic patients. QoL in diabetic patient should always be estimated by complete health care team (e.g., nurses, general practitioners, dialectologists, pediatricians, etc) to offer, in time, a good treatment, because early treatment may prevent or slow disease progression and reduce the chance of invalidity and offer a better quality of life in these patients.

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