

# Quality of life and emotional change for middle-aged and elderly patients with diabetic retinopathy

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## Abstract

• **AIM:** To evaluate the SF-36, Diabetes Specificity Quality of Life Scale (DSQL) and anxiety and depression symptoms and investigate its changes in proliferative diabetic retinopathy (PDR) by vitrectomy interventions.

• **METHODS:** The present study included 108 diabetic retinopathy (DR) patients: 54 with PDR and 54 with non-proliferative diabetic retinopathy (NPDR). Each healthy control group ( $n=54$ ) sociodemographically matched to DR groups was established respectively. The quality of life, anxiety and depression symptoms were evaluated and analyzed on preoperative and postoperative month 1 using SF-36, DSQL and Hospital Anxiety and Depression Scale (HADS).

• **RESULTS:** DR patients described impaired HRQL (Health Related Quality of life, SF-36) in 6 out of 8 subscales, including 'Body Health', 'Body Role

Function', 'General Health', 'Society Function', 'Emotion Role Function' and 'Mental Health'. Compared with controls, DR patients (NPDR and PDR) suffered from statistically significantly impaired HRQL (SF-36 Summary score) ( $P<0.05$ ). By surgical intervention, the anxiety and depression score were significantly reduced, while the health and quality of life (SF-36 Summary scores and DSQL scores) was improved in patients with PDR ( $P<0.05$ ).

• **CONCLUSION:** DR patients were affected in mentation and quality of life. Surgery interventions can improve SF-36, DSQL, anxiety and depression in PDR patients.

• **KEYWORDS:** diabetic retinopathy; SF-36; diabetes specificity quality of life scale; hospital anxiety and depression scale; vitrectomy

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## INTRODUCTION

Diabetes Mellitus (DM) are a major cause of psychosomatic diseases. As a chronic disease, the disability rates of diabetes are increasing, second to the cancer, the cardiovascular and cerebrovascular disease. Diabetic retinopathy (DR) is one of the serious complications of diabetes and the most important characteristic in a diabetic microangiopathy. Since diabetes is a chronic lifelong disease, patients with this disease always afford the physical and mental pain. DR can affect the vision, damage the quality of life and increase the negative psychological emotions, and accelerate the development of DR. Vitrectomy is regarded as first line intervention in DR, and success rates are around 60%-95%.

Diabetes specificity quality of life scale (DSQL) [1,2] and the SF-36 [3] has become an important outcome criterion of surgery interventions, but few was studied in patients with DR. Till now, assessments of health-related quality of life, quantitative measures of a patients perceived well-being, have demonstrated the adverse psychosocial impact of DM [4,5], but little is known about the effects of DR on HRQL (Health Related Quality of life) after the surgery and the correlation with the anxiety and depression. The present study uses the Chinese version of hospital anxiety and depression scale

(HADS) [6], a survey instrument exploring anxiety and depression status through parental proxy, to more extensively characterize the impact of vitrectomy on DR quality of life and assess HRQL in its disease-specific aspects by a priority validated instruments in patients with DR under surgery. Furthermore, the appropriateness of HADS in terms of reflection of anxiety and depression problems in patients with DR was to be assessed. Finally, we examined the potential influence of visual function on the improvement of after vitrectomy. This study has not been previously published to the authors' knowledge.

**SUBJECTS AND METHODS**

**Subjects** The present study included 113 DR patients. The patients enrolled in the study were consecutively referred for examination at the First Affiliated Hospital of Jinan University and the Third Hospital of Nanchang from February, 2008 to June, 2011. They were required to be ≥18 years of age, to have proliferative diabetic retinopathy (PDR) (n=54) were scheduled to undergo vitrectomy surgery. The potential influence of visual function on the improvement of the HADS, DSQL and SF-36 at 1 month after surgery was examined in patients with PDR. A healthy age- and gender-matched each control group (n=54) was also recruited. Patients who had undergone strabismus surgery within the previous year or those who had an unstable family situation, in which consistent guardianship during the study was uncertain, were excluded. Clinical data were abstracted from the medical records, including diagnosis and preoperative and postoperative ocular alignment. Quality of life data were obtained by telephone interview to a parent or guardian preoperatively and again 1 months postoperatively. A healthy age- and gender-matched control group (exclusion criteria: visual impairment and chronic illness) was also included, recruited by the same two hospitals in southern China. Controls were recruited by Department of Medical Psychology at two hospitals in Southern China. From both, patients and controls, informed consent was obtained.

**Methods**

**Diagnostic instruments** This study was conducted to enable differential assessment of HRQL using validated instruments in patients with PDR undergoing surgery. The ability of the HADS, DSQL and SF-36 in anxiety and depression, healthy quality of life in patients with PDR was also assessed. Surgery in PDR patients led to improved HRQL as measured by a DSQL and SF-36 score. To provide data on the severity of psychiatric symptoms in terms of anxiety and depression condition, the HADS-a self-assessment scale has been developed and found to be a reliable instrument to detect states of depression and anxiety in the setting of a hospital medical outpatient clinic-were applied. Three instruments were applied to patients during their post-surgical outpatient visit, to controls *via* postal service at home.

**Table 1 Incidence of anxiety and depression, as determined by HADS Questionnaire, in the two groups of DR patients compared with their age- and gender-matched control group**

	Patients (n, %)		Controls (n, %)	
	HT	HP	C-HT	C-HP
Anxiety	12(22.2)	10(18.5)	1(1.8)	1(1.8)
Depression	10(18.5)	9(16.7)	0(0)	0(0)
Anxiety and depression	5(9.3)	5(9.3)	0(0)	0(0)

C=control; C-PDR: controls to patients with PDR; C-NPDR: controls to patients with NPDR; P=patients.

**Statistical Analysis** Analysis of sociodemographic and medical parameters between two groups was performed by the Chi-square test or the two-tailed, paired Student's *t*-test, analysis of DSQL and SF-36 parameters was performed by multivariate analysis of variance (MANOVA). Quality of life dimension scores were computed as the mean of the responses to those items comprising each subscale. Preoperative and postoperative scores were compared using two-tailed, paired Student's *t*-tests. Results were regarded as statistically significant, in case *P*<0.05. Guidelines of multiple testing were taken into account. Statistical analysis was performed with the SPSS computer package.

**RESULTS**

Totally 113 patients were asked for participation, three patients disagreed due to lack of time or interest, and in two patients inventories were not analyzed due to missing data. Results of HADS indicated some anxiety and depression symptoms in both patient groups. A total of 108 DR patients were asked to participate: 54 PDR patients with a mean±SD anxiety score of (7.11±3.38) and 54 NPDR patients with a mean±SD depression score of (7.59±3.23). Patients and controls (108 age- and gender-matched volunteers) did not differ statistically in any of the sociodemographic parameters. Comparing the patient groups with each other, patients with PDR consistently suffered from more anxiety and depression symptoms. There were no statistically significant differences were found in anxiety and depression score in two patient's group (*P*>0.05), but compared with its corresponding controls, there were the significant differences in anxiety and depression score (*P*<0.05, Table 1).

The hypothesis being tested was that the quality of life (SF-36) was significantly impaired in DR patients, but there were significant differences in SF-36 score between the two patient groups. Both patient groups described impaired HRQL (SF-36) in 6 out of 8 subscales, including 'Body Health', 'Body Role Function', 'General Health', 'Society Function', 'Emotion Role Function' and 'Mental Health'. Compared with controls, both patient groups suffered from statistically significantly impaired disease-specific HRQL (SF-36 Summary score) (*P*<0.05). As to two domains (Body Pain and Vigour) there was a tendency to impaired HRQL in patients compared with controls. Regarding the 6 subscale, patients with PDR were more severely affected than patients

**Table 2 The quality of life in DR patients or control subjects, as determined on the 8 subscales of SF-36 Questionnaire**

	Patients		Controls		Two-factorial analysis of variance		
	NPDR	PDR	C- NPDR	C- PDR	Dx	P/C	Dx×P/C
Body health	70.12±20.75	57.33±14.76	76.72±19.54	77.24±17.89	1.5	12.6 <sup>b</sup>	1.9
Body role function	46.12±42.16	36.25±32.68	52.11±22.84	53.53±20.64	1.7	3.9 <sup>a</sup>	0.2
Body pain	68.32±24.16	59.74±18.77	70.64±20.09	71.32±20.46	0.6	2.2	0.9
General health	47.74±14.64	38.13±10.94	57.88±19.76	55.39±19.81	4.2	8.2 <sup>b</sup>	0.6
Vigour	60.55±19.98	51.62±15.79	62.14±14.23	64.24±13.92	4.4	2.1	1.2
Social function	64.33±19.94	55.24±15.35	66.32±20.11	66.86±21.42	1.1	9.8 <sup>b</sup>	0
Emotion role function	48.34±37.35	40.11±32.67	56.24±36.21	56.64±36.52	4.9 <sup>a</sup>	14.3 <sup>b</sup>	0
Mental health	60.11±18.84	49.11±12.32	67.76±18.92	65.59±18.13	2.3	12.6 <sup>b</sup>	1.4

Dx: diagnosis; P/C: patients vs respective controls; <sup>a</sup> $P < 0.05$ , <sup>b</sup> $P < 0.01$  vs controls.

with NPDR, and a tendency similar in direction was found for the domains 'Body Pain' and 'Vigour' (Table 2).

In patients with PDR, preoperative anxiety score:  $9.79 \pm 3.16$ , preoperative depression score:  $9.87 \pm 3.02$ ; preoperative SF-36 score:  $436.16 \pm 68.77$ , preoperative the DSQL score:  $59.97 \pm 1.69$ , and 1 month after surgery, the anxiety score:  $6.87 \pm 3.11$ , depression score:  $7.09 \pm 3.26$ ; SF-36 score:  $510.23 \pm 78.54$ , DSQL score was  $72.66 \pm 2.15$ . The differences of anxiety, depression and SF36 scores between preoperative and postoperative were statistically significant ( $t_{\text{anxiety}} = 0.14$ ,  $t_{\text{depression}} = 0.19$ ,  $t_{\text{SF-36}} = 0.12$ , all  $P < 0.05$ ). By surgical intervention, the anxiety and depression score were significantly reduced, while the health and quality of life (SF-36 Summary scores and DSQL scores) were improved in patients with PDR. Statistically significant improvements were seen in anxiety, depression and SF-36 Summary scores and DSQL scores (all  $P < 0.05$ ).

## DISCUSSION

DM is a major risk factor for cardiovascular disease, and the prevalence of diabetes is high and is increasing in China [7-9]. DR, as a blind disease, is easily recognized even by adults. Several reasons can cause this disease such as relative or absolute lack of insulin or decreased sensitivity of target cells, metabolism disorders in sugar/protein/fat or water and electrolyte disturbance. At present, the etiopathogenesis of DR has not been fully clarified. However, with the "biological-psychological-social medicine model" development, scholars found that DR is the biological, psychological and social disease. It has been revealed that a negative attitude toward DR appears to all age [10]. In addition, people began to quote from the definition "quality of life (QL)", including SF-36 and DSQL, which can evaluate the DM patient's health from a physical, psychological, social adaptation and so on. Meanwhile, the purpose of DR therapy has been changed from a single control of blood glucose and improving vision to prevent the occurrence of complications and improve patient quality of life. Since DR is a chronic lifelong disease, patients with this disease always afford the physical and mental pain. DR can affect the vision, damage

the quality of life and increase the negative psychological emotions, and accelerate the development of DR. In China, the study on the quality of life is still in the developmental stage. Psychological status in patients with DR was the blank areas with research and clinical practice.

In prior study, we have evaluated the quality of life and anxiety and depression symptoms in strabismus [11-14] and glaucoma [15,16], and investigate some diseases [11,13] changes by surgery interventions. This study explored the impact of DR on visual performance and self reported health related quality of life. To our knowledge, this is the first prospective study including consecutively referred PDR and NPDR patients. The integration of HRQL as clinical endpoint of medical interventions has been proposed and is increasingly implemented in ophthalmology [9-12]. However, studies on HRQL in DR patients are very few. This study has been undertaken to improve the knowledge on outcomes in patients with DR under surgery in terms of disease-specific HRQL. The HADS indicated some anxiety and depression symptoms and revealed distinct DR with more favorable results on the symptomatic level in both patient groups.

In both patient groups, SF-36 is severely impaired in both patient groups, as emphasized by statistically significant HRQL losses in six out of eight subscales. Considering differences between both patient groups, body health, body role function, general health, society function, emotion role function and mental health were statistically significant more impaired in patients with PDR than patients with NPDR and a tendency similar in direction was found for the domains body pain and vigour. As indicated by its responsiveness, the SF-36 adequately reflects HRQL losses in patients with DR. Considering the SF-36, it seems that patients with PDR suffer more from symptoms and HRQL impairment than patients with NPDR. SF-36 also pronounced HRQL losses in patients with PDR may be due to its more disabling character in terms of vision. Regarding the HRQL results comprehensively it is concluded that the diagnosis of DR, is accompanied by substantial HRQL impairment disease-specifically. Treatment of DR should therefore integrate HRQL as outcome criterion,

creation and implementation of specific psychosocial interventions are required. The DSQL was identified as suitable disease-specific tool, the question of its sensitivity to symptomatic changes awaits verification though. Prospective studies with repeated data acquisition are required to examine impact of surgery and psychosocial interventions on functional and HRQL outcome.

HADS<sup>[15]</sup>, which was a self-assessment scale, has been developed and found to be a reliable instrument to detect states of depression and anxiety in the setting of an hospital medical outpatient clinic. The anxiety and depressive subscales are also valid measures of severity of the emotional disorder. It is suggested that the introduction of the scales into general hospital practice would facilitate the large task of detection and management of emotional disorder in patients under investigation and treatment in medical and surgical departments. The treatment of DR should not be considered cosmetic even when there is no hope of improving vision rapidly as it may positively alter the perceived characteristics of individuals and improve their ability to socialize normally. Our results give credence to this concept as the participants suggested that it could be harder for DR patients to have better emotional and psychiatric status. These results strongly support the suggestion that DR may potentially have an anxiety and depression symptoms. These data revealed that post-operative anxiety and depressive symptoms, quality of life scores and health scores were subsequently improved.

In conclusion, this study shows that DR patient also derive psychological benefits from vitrectomy. It has been clearly demonstrated that socially noticeable DR is problematic for all phases of DR patients. Surgery for DR may reverse negative social implications and positively alter the perceived characteristics of adults. This should be considered when evaluating DR patients for surgical treatment, even when there is no hope of physiological gain.

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