

# Vision-related quality of life and depression in rhegmatogenous retinal detachment patients

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## Abstract

The aim of this cross-sectional study is to evaluate vision-related quality of life (VRQoL) and depression in patients with rhegmatogenous retinal detachment (RRD).

The VRQoL and depression were evaluated in 58 patients with unilateral RRD and 58 healthy controls, using the Chinese version of the National Eye Institute Visual Function Questionnaire (CHI-VFQ-25) and the Chinese version of Beck Depression Inventory-II, respectively.

Composite scores of the CHI-VFQ-25 were significantly lower in the RRD patients, compared with the healthy controls ( $P < .001$ ). Lower composite scores were associated with older age ( $P < .01$ ), severer visual loss ( $P < .05$ ), longer duration of the disease ( $P < .05$ ), and macular involved ( $P < .05$ ). The proportion of depression was significantly higher in RRD patients than healthy controls (39.66% vs 5.17%,  $P < .001$ ). The depression of RRD patients was associated with the longer duration of the disease ( $r=0.268$ ,  $P < .001$ ).

The RRD patients suffer from poor VRQoL and a high proportion of depression. Physicians should pay more attention to mental health in RRD patients.

**Abbreviations:** CHI-BDI-II = Chinese version of Beck Depression Inventory-II, CHI-VFQ-25 = Chinese version of the National Eye Institute Visual Function Questionnaire, LogMAR = logarithm of the minimum angle of resolution, RRD = rhegmatogenous retinal detachment, VRQoL = vision-related quality of life.

**Keywords:** depression, mental health, quality of life, retinal expert, rhegmatogenous retinal detachment, risk factors, vitrectomy surgery

## 1. Introduction

Patients with various eye diseases, including age-related macular degeneration, glaucoma, retinitis pigmentosa, have been found to have a decreased quality of life and various degrees of depression.<sup>[1]</sup> A previous study found that depression is prevalent among patients with persistent low vision.<sup>[2]</sup>

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Rhegmatogenous retinal detachment (RRD) is a rapid progress of blinding disease with an incidence of 6.3 to 17.9 per 100,000 population,<sup>[3–5]</sup> and it severely threatens visual acuity. Presumably, China has more than 200,000 RRD patients.<sup>[6]</sup> Due to the limited number of retinal specialist in Guangxi province, a less developed province in Southern China, a large number of patients need a long wait for treatment. The average duration from diagnosis to surgery is too long for RRD patients, which is about 1 month in a retinal treatment center in Guangxi province. In our knowledge, this is a widespread phenomenon in the whole China,<sup>[7]</sup> and it may aggravate many patients suffering from depression and a decline in vision-related quality of life (VRQoL). However, few studies evaluated the quality of life in RRD patients,<sup>[8]</sup> and no study focuses on their mental condition in China. The purpose of this study is to evaluate VRQoL and depression in RRD patients in our hospital.

## 2. Methods

This prospective cross-sectional study was conducted according to the tenets of the Declaration of Helsinki, and was approved by the Institutional Review Board at the First Affiliated Hospital of Guangxi Medical University. Each participant provided a written informed consent for this study.

We recruited patients with RRD between May 2015 and January 2016 hospitalized in the Department of Ophthalmology, the First Affiliated Hospital of Guangxi Medical University. We enrolled patients with unilateral RRD who were 18 years or older. Patients with other ocular diseases that have impaired their visual function obviously (e.g. lens opacity greater than grade II according to the Lens Opacity Classification System III,<sup>[9]</sup> corneal

diseases, glaucoma and age-related macular degeneration) were excluded. For each patient with RRD, an age- and sex-matched healthy subject was enrolled and served as a control. All participants completed Chinese version of the National Eye Institute Visual Function Questionnaire (CHI-VFQ-25) and Chinese version of Beck Depression Inventory-II (CHI-BDI-II) themselves or assisted by their families. These questionnaires have been proven to have good reliability and validity.<sup>[10,11]</sup> The RRD participants completed the questionnaires one day before surgery.

The CHI-VFQ-25 is divided into 12 subscales. Questionnaire subscales were ranged between 0 and 100, with 0 representing the lowest VRQoL and 100 representing the highest VRQoL.<sup>[12]</sup> The CHI-BDI-II consists of 21 self-administered questions. Each question can be scored ranging from 0 to 3. The sum of 21 scores assembles a total score. A total score of 0 to 13, 14 to 19, 20 to 28, and 29 to 63 represent no depression, mild depression, moderate depression, and severe depression, respectively.<sup>[13]</sup>

### 3. Statistical analysis

Decimal visual acuities in this study were converted into the logarithm of the minimum angle of resolution (LogMAR) scores for statistical analysis.<sup>[14]</sup> Dates were statistically analyzed with SPSS 19.0 (SPSS Inc, Chicago, IL). To compare continuous variables of RRD patients and healthy controls, we used the Wilcoxon matching rank test. While frequency variables were analyzed with a Chi-square test between the 2 groups. Correlations among the characteristics of RRD patients, the CHI-VFQ-25 subscale scores, and the CHI-BDI-II scores were calculated using the Spearman's Rank Correlations test. All the tests were 2-tailed, and the significance level was set at  $P < .05$ .

### 4. Results

There were 62 eligible participants with RRD for the study. Four participants cannot complete questionnaires. Finally, 58 participants with RRD in this study were analyzed. Mean age was 50 years in the RRD patients and 50 years in healthy controls (Table 1). In the RRD patients, the median duration of disease was 30 days (range: 6 to 180 days), and the median LogMAR scores in RRD eyes was 1.70 (range: -0.08 to 2.90). The median clock hours of detachment were 7 (range: 2 to 12). There were 32 RRD participants suffered from the detachment of macular (Table 1).

All subscales and overall composite score of CHI-VFQ-25 in the RRD patients were significantly lower than that in the healthy controls (all  $P_s \leq .001$ ). The lowest subscale scores for the RRD patients were Mental health (median: 50) and Role difficulties (median: 50) (Table 2).

The participants with RRD had higher CHI-BDI-II scores than the healthy controls, with median score of 11 vs 5, respectively ( $P < .001$ ). The proportion of depression was significantly higher in RRD patients than in the healthy controls (39.66% vs 5.17%,  $P < .001$ ). Twenty-three (40%) participants with RRD and 3 (5.2%) healthy controls had a CHI-BDI-II score greater than 13 (suggesting depression) ( $P < .001$ ) (Table 2).

Age, LogMAR scores of RRD eyes and duration of disease were negatively correlated with a majority of CHI-VFQ-25 subscale scales (Table 3). We found that there was significantly negative correlated between CHI-BDI-II score and most CHI-VFQ-25 subscale scales in RRD patients, except for role difficulties and peripheral vision (Table 4). The depression of RRD patients was associated with the longer duration of the

**Table 1**

**Characteristics of RRD patients and healthy controls.**

Characteristics	RRD patients (n=58)	Healthy controls (n=58)
Age, mean years (SD)	50 (13)	50 (12)
Sex, n (%)		
Male	37 (64)	37 (64)
Female	21 (36)	21 (36)
RRD eye, n (%)		
Right	32 (55)	—
Left	26 (45)	—
LogMAR score* in RRD eye, median (range)	1.70 (-0.08 to 2.90)	—
LogMAR score in fellow eye, median (range)	0.30 (-0.18 to 4.00)	—
Clock hours of detachment, median (range)	7 (2 to 12)	—
Macular on/off status, n (%)		
On	26 (45)	—
Off	32 (55)	—
Duration of RRD before surgery, median days (range)	30 (6 to 180)	—

RRD=rhegmatogenous retinal detachment, SD=standard deviation.

\*LogMAR scores were converted from decimal visual acuities.

disease ( $r = 0.268$ ,  $P < 0.05$ ). There was no significantly correlation between CHI-BDI-II score and CHI-VFQ-25 subscale scales in the healthy controls, except for Mental health.

### 5. Discussion

In this study, all subscales scores of CHI-VFQ-25 were decreased significantly in RRD patients compared to healthy controls. The

**Table 2**

**Comparison of CHI-VFQ-25 subscales, CHI-BDI-II scores between RRD patients and healthy controls.**

CHI-VFQ-25 Subscales and CHI-BDI-II score	RRD patients (n=58)	Healthy controls (n=58)	P value
CHI-VFQ-25 Subscales			
General health, median (IQR)	54 (43, 65)	65 (60, 76)	.001*
General vision, median (IQR)	55 (44, 66)	78 (65, 85)	<.001*
Ocular pain, median (IQR)	63 (38, 63)	88 (75, 100)	<.001*
Near vision, median (IQR)	58 (42, 75)	92 (83, 100)	<.001*
Distance vision, median (IQR)	67 (42, 75)	92 (83, 100)	<.001*
Social functioning, median (IQR)	75 (63, 75)	100 (100, 100)	<.001*
Mental health, median (IQR)	50 (38, 63)	88 (81, 100)	<.001*
Role difficulties, median (IQR)	50 (38, 50)	88 (63, 100)	<.001*
Dependency, median (IQR)	57 (42, 83)	100 (98, 100)	<.001*
Color vision, median (IQR)	70 (50, 100)	100 (75, 100)	.001*
Peripheral vision, median (IQR)	75 (50, 75)	100 (100, 100)	<.001*
Composite score, median (IQR)	61 (51, 70)	87 (80, 92)	<.001*
CHI-BDI-II score, n (%)			<.001†
0 to 13	35 (60)	55 (95)	
14 to 19	5 (9)	3 (5)	
20 to 28	10 (17)	0 (0)	
29 to 63	8 (14)	0 (0)	

CHI-VFQ-25=Chinese version of the 25-item National Eye Institute Visual Function Questionnaire (Higher scores stand for better vision-related quality of life).

CHI-BDI-II=Chinese version of Beck Depression Inventory-II (A score of 0 to 13, 14 to 19, 20 to 28, and 29 to 63 represent no depression, mild depression, moderate depression and severe depression, respectively<sup>[13]</sup>).

RRD=Rhegmatogenous retinal detachment.

\*Wilcoxon match symbol rank test.

†Pearson Chi-squared test.

**Table 3****Spearman correlations among clinical characteristics, CHI-VFQ-25 scores and CHI-BDI-II scores in RRD patients.**

CHI-VFQ-25 Subscales and CHI-BDI-II score (r) <sup>†</sup>	Age	LogMAR scores in RRD eye	LogMAR scores in the fellow eye	Duration of the disease	Clock hours of detachment	Macular on/off
General health	-0.130	-0.280 <sup>‡</sup>	-0.081	-0.077	-0.210	0.209
General vision	-0.122	-0.286 <sup>‡</sup>	-0.156	-0.082	-0.281 <sup>‡</sup>	0.248
Ocular pain	-0.163	-0.207	-0.246	-0.284 <sup>‡</sup>	-0.155	0.217
Near vision	-0.370 <sup>§</sup>	-0.248	-0.257	-0.179	-0.056	0.165
Distance vision	-0.304 <sup>‡</sup>	-0.269 <sup>‡</sup>	-0.303 <sup>‡</sup>	-0.229	-0.020	0.152
Social functioning	-0.307 <sup>‡</sup>	-0.183	-0.294 <sup>‡</sup>	-0.157	-0.025	0.076
Mental health	-0.233	-0.165	-0.193	-0.363 <sup>§</sup>	-0.135	0.257
Role difficulties	-0.070	0.046	-0.078	-0.095	-0.089	0.088
Dependency	-0.228	-0.203	-0.227	-0.068	-0.209	0.226
Color vision	-0.271 <sup>‡</sup>	-0.130	-0.207	-0.148	-0.022	0.105
Peripheral vision	-0.248	-0.227	-0.222	-0.248	0.096	0.107
Composite score	-0.335 <sup>§</sup>	-0.281 <sup>‡</sup>	-0.289 <sup>‡</sup>	-0.261 <sup>‡</sup>	-0.169	0.262 <sup>‡</sup>
CHI-BDI-II score	0.187	0.236	0.165	0.268 <sup>‡</sup>	-0.006	-0.053

\* CHI-VFQ-25, Chinese version of the 25-item National Eye Institute Visual Function Questionnaire; CHI-BDI-II, Chinese version of Beck Depression Inventory-II; RRD=Rhegmatogenous retinal detachment.

<sup>†</sup> r, Spearman coefficient of rank correlation.

<sup>‡</sup> P<.05.

<sup>§</sup> P<.01.

RRD patients had the most impairment in mental health and Role difficulties. The 40% of RRD patients had varying degrees of depression. And severity of depression was positively associated with duration of the RRD.

Duration of RRD was exhibited as a risk factor for depression in this study. The possible reason is that the fear of blindness aggravates with the extension of the duration.<sup>[15]</sup> This study found that VRQoL in RRD patients were also correlated with depression. However, which one is the reason cannot be confirmed because of the design of this study. Low VRQoL and depression might appear simultaneously in patients. It is warrant to further investigate the relationship between them.

The RRD patients need surgery as soon as possible to achieve better visual outcomes.<sup>[16]</sup> Although there are 22 ophthalmologists per million in the population in China,<sup>[17]</sup> the number of retina surgeons is very limited. Only 4.1% of ophthalmologists can independently carry out vitrectomy.<sup>[7]</sup> In China, RRD patients often have to wait for a long time. In our study, the

patients had to wait for 1 month from the diagnosis to the scheduled operation. They are afraid of getting worse, which probably led to the declined VRQoL and depression. In addition to psychological support, giving patient surgery as soon as possible may reduce depression and improve VRQoL. In order to shorten the time for patients to wait for surgery, training more retina surgeons is one of the solutions.

There are 2 limitations to this study that should be noted. Firstly, we do not know whether the VRQoL and depression can be improved after surgery because of the design of cross-sectional study, but the follow-up study on these RRD patients is in our plan. Secondly, the patients in our study completed the questionnaire one day before the surgery. Fear of surgery might worsen the patient's depression. To our knowledge, however, this is the 1st study to focus on the mental condition in RRD patients.

In conclusion, the VRQoL were severely impaired and a high proportion of depression was noted in RRD patients. The lower VRQoL in RRD patients is associated with older age and poorer visual acuity. The longer duration of this condition may increase the risk of depression. Physicians should pay more attention to the VRQoL and potential depression in RRD patients. It needs to reduce the time from diagnosis to surgery for RRD patients in China.

**Table 4****Spearman correlations between CHI-VFQ-25 subscales and CHI-BDI-II scores in RRD patients.**

CHI-VFQ-25	CHI-BDI-II scores (r) <sup>†</sup>
General health	-0.396 <sup>§</sup>
General vision	-0.387 <sup>§</sup>
Ocular pain	-0.333 <sup>‡</sup>
Near vision	-0.471 <sup>§</sup>
Distance vision	-0.423 <sup>§</sup>
Social functioning	-0.312 <sup>‡</sup>
Mental health	-0.566 <sup>§</sup>
Role difficulties	-0.269 <sup>‡</sup>
Dependency	-0.472 <sup>§</sup>
Color vision	-0.404 <sup>§</sup>
Peripheral vision	-0.281 <sup>‡</sup>
Composite score	-0.539 <sup>§</sup>

\* CHI-VFQ-25=Chinese version of the 25-item National Eye Institute Visual Function Questionnaire; CHI-BDI-II=Chinese version of Beck Depression Inventory-II; RRD=Rhegmatogenous retinal detachment.

<sup>†</sup> r, Spearman coefficient of rank correlation.

<sup>‡</sup> P<.05.

<sup>§</sup> P<.01.

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