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Original Research Article

Assessment of the vision-related quality of life (VR-QOL) in patients with watery eyes

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ABSTRACT

Purpose: Watering from the eyes is one of the common ocular complaints which leads to blurred vision. It has an impact on daily activities and the social life of the individual which is not studied much. Hence, we did this study with the aim to estimate the proportion of watery eye patients in whom the vision-related quality of life (VR-QOL) is affected.

Materials and Methods: We conducted a cross-sectional questionnaire-based study. Patients who complained of watering for more than one month were included. All the patients were asked to fill a VR-QOL questionnaire.

We considered VR-QOL status to be affected if the score for any of the activity listed in the questionnaire was more than or equal to one. We assessed the association of this VR-QOL status with various factors like age, gender, laterality, patency of nasolacrimal duct and Munk score.

Results: A total of 59 patients participated in our study. The mean age of study participants was 52.6 ± 13.8 years and 31 were males. VR-QOL was affected in 89.8% and blurring of vision was the most common impairment. The effect of gender and age on VR-QOL due to watering was not significant. We found that watering of eyes causes a significant blurring of vision (p value=0.031) and discomfort during outdoor activities (p-value 0.045).

Conclusion: Epiphora has a significant impact on VR-QOL. The lacrimal drainage system is the major cause of watery eyes. It is important to include the functional component in the outcome assessment of epiphora treatment.

1. Introduction

Watering from the eyes is one of the most commonly encountered symptoms in ophthalmology.[1,2] It causes much discomfort for the patients in their daily lives. Watery eyes are due to disruption of the physiological balance between the lacrimal secretory and drainage system. It occurs when there is excessive secretion of tears from the lacrimal gland or insufficient tear drainage or both. A myriad of etiological conditions can cause watery eyes.[3] Conditions that lead to excessive tear production include allergies, viral infections (conjunctivitis), local corneal pathologies, central nervous system diseases, reflex hypersecretion in dry eye and autoimmune disorders. The conditions responsible for insufficient lacrimal drainage include eyelid malposition and congenital or acquired nasolacrimal duct blockage. The pooling of water in the eyes makes the vision blurred as the patient sees through the pool of water. This not only has an

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impact on the day today activities but also on the social life of the individual.[4–6] Despite being a common symptom of many ocular diseases, only a few studies are addressing it in the literature. The main aim of the study was to estimate the proportion of watery eye patients in whom the vision-related quality of life (VR-QOL) is affected. We also assessed the association between the severity of watering and the vision-related quality of life (VR-QOL).

2. Materials and Methods

We conducted this cross-sectional, questionnaire-based study at an ophthalmology OPD of a tertiary care centre in South India over six months. The study was approved by the institutional ethics committee. We included all the patients aged 18years and above, who had the primary symptom of watery eyes for more than one-month duration. Written and informed consent was obtained from all participants. We explained the study purpose and obtained written consent from all the participants. We excluded the patients who were unable to respond to the questionnaire independently and the other ocular disease patients with a poor visual acuity (less than 20/200). We graded the severity of watering by Munk score. We called watering that required dabbing four or less than four times a day (Munk Score 1 and 2) mild watering, watering that required dabbing five to ten times a day (Munk Score 3) moderate watering and watering that required dabbing more than 10 times a day or constant tearing (Munk Score 4) severe watering.[7] All the patients were asked to fill a vision-related quality of life questionnaire (VR-QOL) related to watery eyes.[4] This questionnaire is adopted from study by shin at al as questions were easily understood. It was validated sending to 5 experts. A pilot was done on few patients, who were not included in study. This questionnaire (Table 1) consists of 10 items concerned with performing common vision-related daily activities. The frequency of discomfort for ten daily activities was graded on a scale of 0 (never) to 4 (always). If a study participant was not involved in that activity, it was marked as not applicable. Grade 0 was defined as no discomfort, grade 1 and 2 as mild to moderate discomfort, grade 3 and 4 is taken as severe discomfort. We considered VR-QOL status to be affected if the score for any of the activity listed in the questionnaire was more than or equal to one. We assessed the association of this VR-QOL status with various factors like age, gender, laterality, patency of nasolacrimal duct (as tested by syringing) and Munk score.

2.1. Statistical analysis

The proportion of watery eye patients in whom the vision-related quality of life (VR-QOL) is affected was presented as a percentage. A Chi-square test or Fishers exact was used to find the association of VR-QOL with various factors. P-value <0.05 was considered statistically significant.

Assuming that VR-QOL is affected in 90% of watering eye patients with 8% relative precision and a confidence level of 95% sample size is estimated to be 59. We did not find any study mentioning the proportion of watery eye patients in whom the VR-QOL is affected and hence assumed the proportion based on our clinical experience.

3. Results

A total of 59 patients participated in our study. The mean age of study participants was 52.6 ± 13.8 years and 31(52.5%) were males. Most of the participants were the farmer 20(33.9%) or homemaker 20(33.9%). Two (3.4%) participants were students and 17(28.8) belonged to other professions. The mean duration of watering was 26.1 ± 31.2 months (mean ± SD). Right eye was involved in 19(32.2%), left in 2(35.6%) and both eyes in 19(32.2%) respectively. Forty-five (76.2%) participants had blurring of vision more than or equal to half of the time of daily activity due to watering. Eight (13.6%) participants had blurring of vision sometimes and six (10.2%) never had blurring of vision. Diseases of the lacrimal drainage system were responsible for watery eyes in most of the cases (47, 79.7%). Nasolacrimal duct obstruction was the commonest (36,63%) cause for watering (Figure 1).

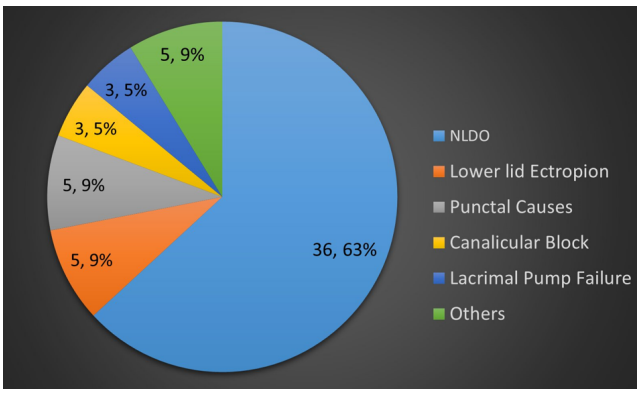

Fig. 1: Showing causes of symptomatic watering

VR-QOL was affected in 89.8% and blurring of vision was the most common impairment. (Table 2). All the patients responded to the blurred vision question. Less than half responded for computer work and driving mainly because most of the participant never drived or used computer. The extent to which the routine activities were affected in the respondents because of watering is summarized in Table 2. The effect of gender and age on VR-QOL due to watering was not significant (Tables 3 and 4). We found that watering of eyes causes a significant blurring of vision (p value=0.031) and discomfort during outdoor activities (p-value 0.045). (Table 5)

There was no significant difference in VR-QOL whether a single or both the eyes were affected. Patients with

complete obstruction of lacrimal irrigation had a greater discomfort than those who had partially patent lacrimal systems, but the difference was not statistically significant (Table 6).

Table 1: Vision related quality of life (VR-QOL) questionnaire for watering eyes

1. Do you have any blurring of vision due to watering from eyes?	0 1 2 3 4 NA
2. Do you have difficulty in reading due to watering from eyes?	0 1 2 3 4 NA
3. Do you have difficulty in night driving due to eye watering?	0 1 2 3 4 NA
4. Do you have difficulty in watching TV due to eye watering?	0 1 2 3 4 NA
5. Did you experience any difficulty while working in the computer due to watering from eyes?	0 1 2 3 4 NA
6. Do you have difficulty in performing house-hold activities due to watering from eyes?	0 1 2 3 4 NA
7. Do you have difficulty in performing outdoor activities due to watering from eyes?	0 1 2 3 4 NA
8. Do you have difficulty in performing Work –related activities due to watering from eyes?	0 1 2 3 4 NA
9. Do you have difficulty in maintaining Inter-personal relationships due to watering from eyes?	0 1 2 3 4 NA
10. Is your general happiness being affected dueto watering due to watering from eyes?	0 1 2 3 4 NA

0-None of the time; **1-**Some of the time; **2-**Half of the time; **3-**Most of the time; **4-**All the time; **NA-**Not Applicable

4. Discussion

VR-QOL was affected in 89.8% of watery eye patients. The severity of watering eyes caused a significant blurring of vision and significantly affected outdoor activities.

Many studies have evaluated VR-QOL in dry eye.[2,8] Only a few studies have addressed the effect of watering eye on VR-QOL.Watery eye is one of the most common symptoms encountered in ophthalmology practice and is found in many systemic and local pathological conditions.[1,2] Despite this, watery eyes are often neglected and are not identified as real discomfort. [9,10]Quality of life according to the World health organization is multidimensional. It depends on general health, psychological condition, level of independence in patient's daily activities, social relationships, environment, and possibilities for the realization of personal goals.[9–11]The importance of tear film for quality vision has been discussed in previous studies. The corneal surface is the highest refractive optical interface in the human eye which requires a healthy tear film for optimal functioning. An increase or decrease in the thickness of tear film induces higher-order wavefront aberration and affects the light pathway.[12–14] In the present study, we assessed the VR-QOL by a questionnaire published by Shin et al. It consists of 10 questions. We also graded the severity of watering by Munk score.[7]

Young patients feel greater discomfort due to watering.[4] In the present study VR-QOL was not affected by age changes. On age-related analysis, old patients had lower scores in most activities compared to young, but the difference was not significant. This might be because of non-response to those questions which do not apply to that age as such, for example, the computer was not used by most of the people over 60.

Analysing the gender effect on discomfort in daily household activities due to watering, we found conflicting results. Whereas Shin et al observed that household activities were more affected in females, Juri JM et al showed male patients had significantly higher scores when questioned. In our study effect on VR-QOL were similar for both male and females.[6]

Our patients showed a hindrance in all the categories, especially in the outdoor activities (p-value 0.045). Most of our patients were farmers and their fieldwork was affected. Other studies in the literature also support our finding.[4,6] Epiphora is a distressing symptom that affects full participation in outdoor activities as it requires constant dabbing. Although the association of severity of watering with work-related activities did not reach a significant level, we found that 34 (65%) of 52 patients who responded to this question had severely affected VR-QOL of which 23(67%) had to dab tears more than ten times a day. A similar observation was made for the association between watering and happiness and interpersonal relationship. Discomfort during interpersonal relations leads to reduced general happiness and a poor quality of life.[6] In the study by Shin et al, older patients with watering had better scores for interpersonal relationships, which might reflect older people receding from active social life and having less discomfort from epiphora in interpersonal relations than younger people.[4]Females had higher scores for interpersonal relationships in their study. However, we did not find any gender or age difference between the interpersonal relationship scores.

Reading, watching TV and general happiness was affected in many patients but the association was not significant. Forty-four participants responded to the question related to reading. It should be noted that most of the patients were farmer, their daily reading activity being limited to reading newspaper, currency denomination, news over television and data on mobile. It is difficult to comment on the association between vision-related discomfort and, computer use and driving because few of the patients performed these activities. We had only 12 participants who responded to question on computer-related work. The rest of the participants did not use the computer (Table 2). One of the students with both punctum

Table 2: Severity of vision related discomfort because of watering eye

Activities	Number of respondents n(%)*	VR-QOL affected inn(%)**	Severe Discomfort		Mild to Moderate		No Discomfort
			Always n(%)**	Most of times n(%)**	Half of time n(%)**	Sometimes n(%)**	Never n(%)**
Blurring of vision	59 (100)	53 (89.8)	20 (33.9)	14 (23.7)	11 (18.6)	08 (13.6)	06 (10.2)
Reading	44(74.6)	37(84.1)	14 (31.8)	14 (31.8)	05 (11.4)	04 (9.1)	07 (15.9)
Driving	18(30.5)	16(88.9)	06 (33.3)	05 (27.8)	03 (16.7)	02 (11.1)	02 (11.1)
Television	47(79.7)	38(80.9)	13 (27.7)	13 (27.7)	05 (10.6)	07 (14.9)	09 (19.1)
Computer	12(20.3)	10(83.3)	02 (16.7)	04 (33.3)	01 (8.3)	03 (25.0)	02 (16.7)
Household	53(89.8)	45(84.9)	13 (24.5)	14 (26.4)	11 (20.8)	07 (13.2)	08 (15.1)
Outdoor	53(89.8)	49(92.5)	20 (37.7)	16 (30.2)	07 (13.2)	06 (11.3)	04 (7.5)
Work related	52(88.1)	49(94.2)	19 (36.5)	15 (28.8)	10 (19.2)	05 (9.6)	03 (5.8)
Interpersonal	57(96.6)	46(80.7)	09 (15.8)	16 (28.1)	11 (19.3)	10 (17.5)	11 (19.3)
Happiness	58(98.3)	47(81.0)	12 (20.7)	18 (31.0)	09 (15.5)	08 (13.8)	11 (19.0)

n: Number of respondents
***:** Numbers in bracket are percentage out of 59
****:** Numbers in bracket are percentage out of corresponding number of respondents
VR-QOL: Vision related quality of life

Table 3: Age and vision related discomfort due to watering eye

Activities	Always	Most of the times	Half of the time	Sometimes	Never	Number of respondents	P value
Blurring of vision							
≤ 50 years	09	03	05	06	03	26	
> 50 years	11	11	07	02	03	34	0.174
Reading							
≤ 50 years	04	03	00	08	06	21	0.168
> 50 years	03	01	05	06	08	23	
Driving							
≤ 50 years	04	02	03	01	00	10	
> 50 years	02	03	00	01	02	08	0.282
Television							
≤ 50 years	04	05	01	06	06	22	0.598
> 50 years	05	02	04	07	07	25	
Computer							
≤ 50 years	02	04	01	02	00	09	
> 50 years	00	00	00	01	02	03	0.073
House hold							
≤ 50 years	04	02	04	07	05	22	0.881
> 50 years	04	05	07	07	08	31	
Outdoor							
≤ 50 years	01	02	02	09	08	22	0.705
> 50 years	03	04	05	07	12	31	
Work related							
≤ 50 years	01	01	02	08	10	22	0.349
> 50 years	02	04	08	07	09	30	
Interpersonal interaction							
≤ 50 years	04	03	05	06	07	25	0.260
> 50 years	07	07	06	10	02	32	
Happiness							
≤ 50 years	03	03	03	08	08	25	0.395
> 50 years	08	05	06	10	04	33	

Table 4: Gender and vision related discomfort due to watering eye

Activities	Always	Most of the times	Half of the time	Sometimes	Never	Number of respondents	P value
Blurring of vision							
Male	11	09	04	04	03	31	
Female	09	07	05	03	04	28	0.958
Reading							
Male	04	02	02	09	10	27	0.755
Female	03	02	03	05	04	17	
Watching Television							
Male	06	03	03	05	09	26	0.521
Female	03	04	02	08	04	21	
Computer							
Male	02	02	01	03	01	09	
Female	00	02	00	00	01	03	0.627
Household							
Male	05	04	05	04	08	26	0.425
Female	03	03	06	10	05	27	
Outdoor							
Male	03	03	03	08	13	30	0.753
Female	01	03	04	08	07	23	
Work related							
Male	02	02	04	07	13	28	0.534
Female	01	03	06	08	06	24	
Interpersonal interaction							
Male	07	04	07	08	05	31	0.814
Female	04	06	04	08	04	26	
Happiness							
Male	06	04	05	09	07	31	0.994
Female	05	04	04	09	05	27	

stenosis had constant discomfort while working on the computer (Munk score 4). Another student with centurion syndrome had discomfort half of the time (Munk score 2).VR-QOL scores were similar irrespective of whether one or both sides were involved. Bilaterality does not lead to poorer VR-QOL. This has been seen in other studies.[4,6] Thus epiphora itself causes significant discomfort in routine daily work, irrespective of whether one or both eyes was involved.Nasolacrimal duct obstruction (NLDO) is the most common cause for symptomatic watering, with an incidence of 20.24 per 100,000.[15] Our set of patients, we had NLDO (64.4%) as the most common cause was lacrimal drainage obstruction in patients, this is followed by punctual block and canalicular block. Complete obstruction in a lacrimal irrigation test showed higher discomfort than partial obstruction though not statistically significant, consistent with the study by Shin et al.[16] Multiple studies have evaluated the success and failure rates of dacryocystorhinostomy based on a lacrimal irrigation test, measurement of the height of the lacrimal lake, the amount of residual fluorescein in a dye disappearance test, and measurement of the size of the bony ostium in an endonasal endoscopy. These objective measurements do not necessarily mean improvement in QOL.[17] Bakri et al retrospectively compared the benefit of endoscopic laser assisted DCR and external DCR patients using the Glasgow Benefit Inventory (GBI) which is commonly used for the measurement of surgical benefit in rhinological procedures. It did not consider ocular symptoms for nasolacrimal surgery. They showed that the GBI is a useful tool to compare and evaluate the outcome, but it did not reflect the improvement of patients discomfort.[3] NLDO-SS score was used by Smirnov G et al to question the patients about their symptoms.[18] Their score included the following parameters: tearing, discharge in the eyes, swelling around the eye, pain around the eye, Change in visual acuity, nose blockage, nasal cavity discharge, general condition. Numeric Rating Scale (NRS; 0 = no symptom, 10 = worst imaginable symptom). They concluded, it is easy to obtain reliable information from patients with this scoring system and it easy to understand and gave information which consistent with objective findings. The specific aim of their study was to evaluate the impact of primary EN-DCR on the QOL and symptoms, though they documented change in vision but did not correlate to daily activities. We have used the scoring system by Shin et al which had ten questions related to vision-related routine activity. Visual acuity is taken as an objective measure of disease severity

Table 5: Effect of severity of watering (Munk Score) on VR-QOL

Severity of VR-QOL	Munk score			P value
	Mild Watering Dabbing 1-4 times a day	**Moderate Watering** Dabbing 5-10 times a day	**Severe Watering** Dabbing > 10 times a day	
Blurring Vision				
Severe	05	05	24	0.031
Mild to moderate	06	07	06	
Never	01	03	02	
Reading				
Severe	04	08	16	0.088
Mild to moderate	03	00	06	
Never	01	04	02	
Driving				
Severe	02	02	07	0.205
Mild to moderate	03	01	01	
Never	01	01	00	
TV				
Severe	02	07	17	0.075
Mild to moderate	04	05	03	
Never	02	01	06	
Computer				
Severe	00	02	04	0.056
Mild to moderate	03	01	00	
Never	00	01	01	
Household				
Severe	04	07	16	0.335
Mild to moderate	07	05	06	
Never	01	03	04	
Outdoor				
Severe	06	07	23	0.045
Mild to moderate	05	04	04	
Never	00	03	01	
Work related				
Severe	04	07	23	0.066
Mild to moderate	06	03	06	
Never	00	02	01	
Inter -Personal				
Severe	03	04	18	0.296
Mild to moderate	05	07	09	
Never	02	04	05	
Happiness				
Severe	03	06	21	0.075
Mild to moderate	05	05	07	
Never	04	04	03	

Table 6: Association of laterality and syringing with VR-QOL due to watering eye

		VR-QOL Status			Total	P
		Normal	**Mild to Moderate**	**Severe**		
Laterality	Unilateral	1(2.5%)	2	37(92.5%)	40	0.586
	Bilateral	0	2	17(89.5%)	19	
Syringing	Patent	0	2(13.3%)	13(86.7%)	15	0.182
	Not Patent	0	2(5.6%)	34(94.4%)	36	
	Partially Patent	1(14.3%)	0(0.0%)	6(85.7%)	7	

VR-QOL: Vision related quality of life

and response to treatment, in vision-related disorders. All our patients had a good visual acuity, despite which they had vision-related discomfort. Hence the functional outcome as important as objective assessment of medical procedures and is better for assessing patients' satisfaction.[5,10]

Constant watering from the eye causes depression in these patients. A Croatian study surveyed 210 patients for the discomfort caused in daily activities. The authors divided patients into three groups: group I - patients with the watery eye of different aetiologies, group II - patients with one pseudophakic eye and the other cataract eye, group III - patients with unilateral pathology of the macular region. The study showed that the group with a watering eye expressed the highest depression levels. In this study, the group with watery eye had a significant hindrance in almost all questioned categories, and especially the outdoor activities. The group of patients with watery eye and a group with unilateral macular pathology showed comparable results. Additionally, vision-related quality of life was poorest among this group of patients.[6]Another study assessed the effect of epiphora on patient's subjective visual function using V-14 questionnaire and compared it with the degree of impairment of visual function in patients awaiting second-eye cataract surgery. Looking at the difficulties in performing various daily life activities, epiphora patients had more difficulties than second-eye cataract patients. Difficulty in performing routine activities in patients with epiphora is similar to visual handicap in patients with unilateral cataract.[19]

Our study had certain limitations. As most of participants where farmers hence significant discomfort was present for outdoor activities which may not be applicable for occupation which involves indoor activities.

5. Conclusion

Epiphora has a significant impact on VR-QOL. This leads to discomfort in daily activities, which needs to be considered in patient management. The lacrimal drainage system is the major cause of watery eyes. It is important to include the functional component in the outcome assessment of epiphora treatment. This can be done using Quality of life questionnaires which can reflect subjective components of pathological conditions and add deeper insight into objective clinical findings.

6. Source of Funding

Nil

7. Conflict of Interest

The author(s) declared no potential conflicts of interest.

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