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Original Article

Ophthalmology Section

Health-Related Quality of Life (HRQoL) in Young Adults with Strabismus in India

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ABSTRACT

Introduction: Strabismus has negative psycho-social and functional effects in adults. The impact can be minimised with surgery. However, in a low-income setting, it is important to evaluate the level of impact and prioritise the target population for intervention. The Adult Strabismus (AS-20) questionnaire is a reliable tool for assessment of Health-Related Quality of Life (HRQoL) in strabismic adults.

Aim: To assess the HRQoL in young adults with manifest strabismus through psychosocial and functional scores according to gender and direction of deviation using the AS-20 questionnaire.

Materials and Methods: In this cross-sectional cohort study, 132 young adults who manifest horizontal strabismus were recruited and the AS-20 questionnaire was administered. Patient's demographic profile and type of strabismus were noted and compared with the overall mean scores of psycho-social and functional subscales. Data was analyzed using SPSS 21 and p-value less than 0.05 was considered statistically significant.

Results: The participants comprised of 70 (53.03%) males and 62 (46.97%) females with a mean age of 24.5±3.57 years (range 18 to 38 years). The overall mean AS-20 score of young adults with strabismus was 61.62±12.61. The overall mean score for male and female were 65.54±13.53 and 57.68±13.46, respectively. Similarly, the mean scores for esotropes was 57.03±11.66 and 66.19±15.30 for exotropes. The overall mean scores were statistically significantly reduced (decreased QoL) in females as compared to males (CI 95%; p=0.002) and in esotropes as compared to exotropes (CI 95%; p=0.001). However, there was no significant difference between the psychosocial and functional score for all types of strabismus and genders (for all, p>0.05).

Conclusion: The Quality of Life (QoL) is affected through psychosocial and functional factors in adults with strabismus. Females and adults with esotropia faced greater difficulties in the QoL. We recommend clinicians to consider the impact on QoL while managing adult with strabismus.

Keywords: Adult strabismus questionnaire, Esotropia, Exotropia

INTRODUCTION

The global prevalence of strabismus in adult population stands at 4% and the condition demands a public health attention [1]. Manifest strabismus is the misalignment of the two eyes in the primary position and is usually associated with a decrease of vision, diplopia and eye strain. Strabismus in adults have negative psychological and functional effects [2,3]. The young adults with strabismus have psychosocial difficulties like self-image and interpersonal relationships [4]. The presence of strabismus leads to forming preconceptions which usually have a negative impact on social and employment opportunities [5]. Furthermore, adults with manifest strabismus are more likely to suffer mental health problems [6-8].

Strabismus is reported to have a greater impact on the QoL as compared to other sight-threatening conditions like diabetic retinopathy and age-related macular degeneration [9]. Several studies have shown that QoL is compromised in individuals with strabismus [10-12]. However, to much relief, it has been reported that a surgery for strabismus can significantly improve the QoL [13-16].

It is important to correlate the demographic profile and clinical features with the QoL in adults with strabismus and identify the target population for intervention. The aim of this study was to assess the psychosocial and functional scores and its association with type of deviation and gender using the AS-20 questionnaire in young adults with strabismus in Indian population.

MATERIALS AND METHODS

In this cross-sectional questionnaire-based study, consecutive adults diagnosed with strabismus visiting Amity Optometry Clinic and Ahooja Eye and Dental Hospital in Gurgaon, Haryana, India between January to August 2016 were recruited. This study adhered to the tenets of Declaration of Helsinki and was approved by Institutional Ethical Board of Amity University, Haryana.

Subjects between the age of 18 to 40 years diagnosed with manifest horizontal strabismus (esotropia and exotropia) were eligible for the study. However, patients with pathologic nystagmus, neurological disorders, facial deformity, other ocular diseases and vertical dissociated strabismus were excluded from the study. Patients who were not able to fill the questionnaire due to reduced mental ability or lack of English literacy were also excluded.

Prior to the conduct of the study, research information sheets were provided to the subjects and informed consent was obtained stating their acceptance to voluntarily fill the questionnaire. Demographic profile and the direction of strabismus (esotropia or exotropia) were recorded. The original English version of the AS-20 questionnaire was administered and subjects were asked to fill it independently.

The AS-20 questionnaire used in this study is a reliable and valid HRQoL questionnaire to assess the psychosocial and functional concerns of QoL in adults with strabismus [17]. The AS-20 questionnaire is preferred over Visual Function Questionnaire (VQF-25) for assessment of HRQoL in adult strabismus [18-20]. It has 20 questions in two subscales: 1) Psychosocial subscale (questions 1-10); and 2) Functional subscales (questions 11-20). Each question in the AS-20 questionnaire is designed to be answered on a 5-point Likert-type scale ('never'=100, 'rarely'=75, 'sometimes'=50, 'often'=25, and 'always'=0). The

median overall score ranged from 0 (worst HRQoL) to 100 (best HRQoL) and for a normal individual, the median overall score is 95 (range 85-100) [17].

STATISTICAL ANALYSIS

A sensitivity power analysis using the G power computer program, showed that effect size between males and females was 0.63 and between the types of deviation was 0.64 with power (1 - β) set at 0.80 and α = 05, two-tailed. Therefore, our sample size was considered adequate for the study.

Statistical Package for Social Sciences (SPSS version 21) was used for statistical analysis. The descriptive test was used to analyse the demographic data. After the data were tested for normality, paired t-test and independent sample t-test were performed. Values of $p<0.05$ were considered statistically significant.

RESULTS

A total of 143 questionnaires were administered, however, responses from only 132 participants (92.3%) were considered for analysis. Others were rejected for incomplete or inadequate information. Demographic data obtained were age, gender, ethnicity, highest education and occupation. There were 59.1% (n=78) participants with exotropia and 40.9% (n=54) with esotropia. There were 70 males (53.03%) and 62 females (46.97%). The mean age of patients was 24.5±3.57 years (range 18 to 38 years). The mean age of male and female were 25.30±4.42 and 24.15±3.13 years, respectively. The summary of the demographic profile is as tabulated in [Table/Fig-1].

The overall average AS-20 score of adults with strabismus was 61.62±12.61. The mean score on psycho-social subscale and functional subscale was 61.35±10.94 and 61.89±12.61, respectively. The overall score of male was 65.54±13.53 and score of female was 57.68±13.46. The paired t-test showed that, with a difference of 7.85 (CI. 95%), the average score of males was significantly better than that of females (p=0.002). The gender-wise average AS-20 score of both psycho-social and function subscale are shown in [Table/Fig-2]. The overall average score of adults with esotropia was 57.03±11.66 and that of exotropia was 66.19±15.30. With a difference in average score of 9.16 (CI, 95%), adults with exotropia had a significantly better average score (p=0.001). The average AS-20 score of both psycho-social and function subscale according to the type of strabismus are shown in [Table/Fig-3].

Categories		Esotropia (n=54)	Exotropia (n=78)	Total (n=132)
		Number (%)	Number (%)	
Gender	Male	27 (50.0)	43 (55.1)	70 (53.0)
	Female	27 (50.0)	35 (44.9)	62 (47.0)
Religion	Hindu	39 (72.2)	53 (67.9)	92 (69.7)
	Muslim	11 (20.4)	15 (19.2)	26 (19.7)
	Christian	3 (5.6)	3 (3.8)	6 (4.5)
	Sikh	1 (1.9)	4 (5.1)	5 (3.8)
	Others	0 (0.0)	3 (3.8)	3 (2.3)
Highest education	Class 10 or below	13 (24.0)	32 (41.0)	45 (34.1)
	Class 12/ Diploma	28 (51.9)	26 (33.3)	54 (40.9)
	Bachelors degree	12 (22.2)	14 (18.0)	26 (19.7)
	Masters and above	1 (1.9)	6 (7.7)	7 (5.3)
Occupation	Unemployed	7 (13.0)	6 (7.7)	13 (9.8)
	Student	18 (33.3)	31 (39.7)	49 (37.1)
	Corporate sector	16 (29.6)	19 (24.4)	35 (26.5)
	Government job	3 (5.6)	5 (6.4)	8 (6.1)
	Business	10 (18.5)	17 (21.8)	27 (20.5)

[Table/Fig-1]: The demographic profile of the study population.

Psycho-social Subscale Score				Functional Subscale Score			
Item No.	Male (Mean)	Female (Mean)	Total (Mean)	Item No.	Male (Mean)	Female (Mean)	Total (Mean)
1	87.5	95.83	91.67	11	87.51	95.82	91.67
2	73.6	68.8	71.20	12	72.57	69.83	71.20
3	45.45	62.5	53.98	13	54.55	53.4	53.98
4	52.18	56.3	54.24	14	52.5	55.98	54.24
5	51.79	50.56	51.18	15	49.56	52.79	51.18
6	54.16	66.67	60.42	16	72.43	48.4	60.42
7	44.43	52.04	48.24	17	50.5	45.97	48.24
8	47.18	41.66	44.42	18	54.57	34.27	44.42
9	68.08	84.63	76.36	19	83.44	69.27	76.36
10	56.15	78.24	67.20	20	77.58	56.81	67.20
Mean ±SD	65.57± 13.08	57.12± 9.92	61.35 ±10.94	Mean ±SD	65.52± 14.67	58.25± 16.83	61.89± 12.61

[Table/Fig-2]: The mean AS-20 score of psycho-social and function subscale between male and female.

Psycho-social subscale score				Functional subscale score			
Item No.	Esotropia (Mean)	Exotropia (Mean)	Total (Mean)	Item No.	Esotropia (Mean)	Exotropia (Mean)	Total (Mean)
1	55.51	50.00	52.76	11	87.50	95.83	91.67
2	69.42	77.13	73.28	12	73.60	68.80	71.20
3	55.51	52.69	54.10	13	45.45	62.50	53.98
4	50.58	47.96	49.27	14	52.18	56.30	54.24
5	54.42	72.96	63.69	15	51.79	50.56	51.18
6	36.09	52.13	44.11	16	54.16	66.67	60.42
7	62.50	77.13	69.82	17	44.43	52.04	48.24
8	49.68	72.96	61.32	18	47.18	41.66	44.42
9	62.44	74.07	68.26	19	68.08	84.63	76.36
10	64.10	89.62	76.86	20	56.15	78.24	67.20
Mean ±SD	56.03± 9.42	66.67± 14.58	61.35± 10.94	Mean ±SD	58.05± 14.00	65.72± 16.75	61.89± 12.61

[Table/Fig-3]: The average AS-20 score of psycho-social and function subscale between esotropia and exotropia.

Characteristics	Subscales	AS 20 Score (Mean±SD)	p-value*
Male	Psycho-social subscale	65.57±13.08	0.994
	Function subscale	65.52±14.76	
Female	Psycho-social subscale	57.12±9.92	0.857
	Function subscale	58.25±16.83	
Esotropia	Psycho-social subscale	56.03±9.42	0.708
	Function subscale	58.05±14.00	
Exotropia	Psycho-social subscale	66.67±14.58	0.895
	Function subscale	65.72±16.75	

[Table/Fig-4]: Comparision of psycho-social and functional subscale scores between different types of strabismus and gender.
*p-value <0.05

DISCUSSION

Over the past decade, the assessment of HRQoL has emerged as a trend in healthcare as it aids in making the decision through evidence-based practice hence, the assessment of QoL in patients should be encouraged [1,21]. This study tried to assess HRQoL and its association with different types of strabismus and gender using the AS-20 questionnaire in young adults with strabismus in Indian population.

In this study, the overall mean AS-20 score in young adults with strabismus (61.62) correlates to decreased HRQoL-. The median score with the AS-20 questionnaire in a normal non-strabismic

person is between 85 and 100 [17]. The psychosocial subscale score (61.35) and functional subscale score (61.89) in the strabismic adults in this study was comparatively low for both psycho-social subscale score (94) and functional subscale score (91) reported in normal adults [17]. Strabismic individuals are equally affected both psychologically and functionally. The mean scores for both psychosocial and functional subscales showed that strabismus affected HRQoL in young adults in India. These findings were in agreement with studies conducted in developed countries [2, 11,12]. It suggests that, decrease in QoL is indifferent despite the geographical differences.

This study found a higher prevalence of exotropia and similar findings were reported in South India, China and Hongkong [22-24]. Higher prevalence of exotropes could be attributed to increasing prevalence of myopia globally and particularly in the Asian population. In a 20 year long study by Ekdawi NS et al., it was found that 90% of myopia was associated with intermittent exotropia [25]. The inclusion of only horizontal strabismus was due to that fact that, it was more prevalent and easily visible.

Consistent with earlier findings by several authors from different countries, our results indicated that, females with strabismus have lower AS-20 scores, and hence, greater impact on the QoL as compared to males with similar ocular conditions [26-30]. Women with strabismus suffered from mental disturbance, higher depression, disturbed family relationships and had less employment opportunity compared to normal women. The presence of strabismus affects facial symmetry and appearance. The reduced psycho-social scores could be because of greater appearance anxiety in females. Anxiety due to appearance is increased after viewing advertisements featuring idealized images in young females [31].

This study also demonstrated that, adults with esotropia face more psycho-social and functional difficulties as compared to exotropes. Few previous studies also reported that, individuals with esotropia were rated more negatively in terms of attentiveness, competentness, intelligence and communication skills than those with exotropia [3,32]. In a study by Nelson BA et al., it was found that, males with esotropia felt that their intelligence was underestimated and had a negative social bias in the workplace [33].

However, this finding contradicts to a few earlier reports which found that there was no significant difference in overall scores of AS-20 between individuals with manifest horizontal deviations [4,30,33]. They reported both people esotropia and exotropia faced similar difficulties in the QoL. There was no study to compare these findings in adults of Indian origin. The reason for decreased QoL reported in this study is not clearly understood and demands further research works.

This study demonstrated that, there was a significant decrease in QoL in females and esotropes in Indian population. These observations were similar to an American study which reported that QoL was negatively affected by the presence of esotropia and in females [28]. This study highlights the fact that QoL in adult strabismus is associated with gender and the direction of deviation.

LIMITATION

This study demonstrated the association of AS-20 scores between gender and type of deviation only, and nothing could be commented on the other demographic variables. The other limitation was that no control group was considered.

CONCLUSION

This study found that young adults with strabismus face difficulties in HRQoL through both functional and psychosocial factors. Individuals with esotropia and females affected more as compared to exotropes and males in Indian population.

In light of the fact that this study was carried out in the young and literate cohort of adults, we postulate that the AS-20 scores could be worse in people outside this population. Therefore, correction of strabismus in adults should no longer be labeled as 'only cosmetic'. We suggest clinicians to recognise the impact on the QoL and consider eye alignment surgeries in strabismic adults even if the functional visual prognosis is not good. Gender and type of deviation may also be considered while managing cases of strabismus in Indian population.

Ethical approval: The study was approved by the Institutional Ethics Committee of Amity University Haryana (Approval No. AUH/EC/D/2016/35).

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