Quality of Life in Patients with Leber Hereditary Optic Neuropathy

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INTRODUCTION

- Leber's hereditary optic neuropathy (LHON) is an inherited mitochondrial optic neuropathy, causing progressive irreversible visual loss. [1]
- Anxiety and depression can accompany loss of visual function in LHON patients and adversely affect quality of life. [2]

AIMS:

1. To assess visual function using the validated visual function-14 questionnaire (VF14) and National Eye Institute Visual Function questionnaire (VFQ 25). [3],[4]
2. To screen for anxiety and depression using the Hospital Anxiety and Depression Scale (HADS). [5]

METHODS

- Patients with genetically confirmed LHON mutation were recruited from a clinical database held by the Mitochondrial research group, Newcastle upon Tyne, England.
- **Inclusion criteria:** affected patients > 18 years with an isolated visual phenotype
- **Exclusion criteria:** patients with LHON plus syndrome
- Asymptomatic family members of affected patients with a genetically confirmed mutation were invited to participate in the control group.
- A standardised telephone interview was conducted which utilised the following self reported questionnaires: VF-14, VFQ-25 and HADS.
- In total 50 affected patients and 28 unaffected carriers from 43 genealogical distinct pedigrees participated in the study.

QUESTIONNAIRES:

VF14 & VFQ25:
- VF14 and VFQ25 (visual function assessment) are both scored out of 100.
- Higher scores on VF14 and VFQ25 indicate better visual function.

HADS
- HADS questionnaire is a screening tool for anxiety and depression in the general population.
- It provides a score out of 21 for both disorders.
- Score of 0-7 is considered normal on HADS. (5)
- A recommended cut off score of 8/21 is used to screen for anxiety and depression. [6]

RESULTS

TABLE 1: Patient characteristics

Characteristics	Affected patients n=50	Unaffected carriers n=28	p-value
Age in years (range)	44.8 (20-77)	51.2 (22-69)	p=0.03
Male gender	37 (74.0%)	4 (14.3%)	p<0.001
Type of mutation			p=0.79
G11778A	34 (68%)	20 (71%)	
T14484A	5 (10%)	4 (14%)	
G3460C	5 (10%	4 (14%)	
Other	6 (12%)		
Symptom duration (years)	14.0 (±13.1)	-	-
Age of symptom onset (years)	30.7 (±17.0)	-	-

TABLE 2: Questionnaire Results

	Affected patients n=50	Unaffected carriers n=28	p-value
VF-14 score	29.4 (±24.0)	98.6 (±2.5)	p<0.001
VFQ-25 score	48.3 (±19.8)	92.9 (±4.2)	p<0.001
HADS-Anxiety (HADS-A) score	7.5 (±3.9)	7.4 (±3.7)	p=0.90
HADS-Depression (HADS-D) score	5.7 (±4.1)	4.4 (±3.1)	p=0.02

TABLE 3: Percentage breakdown of HADS-A and HADS-D scores for affected and unaffected carriers

	Affected Carriers		Unaffected Carriers	
HADS Scores	HADS –A	HADS-D	HADS-A	HADS-D
0-7	46 %	72%	50%	89%
8-11	44%	20%	32%	11%
12-21	10%	8%	18%	0%

FIGURE 1A: A comparison of VF14 scores in affected LHON patients versus unaffected carriers. P value < 0.001

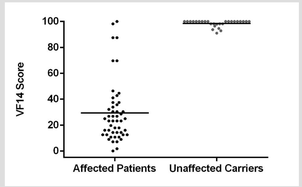
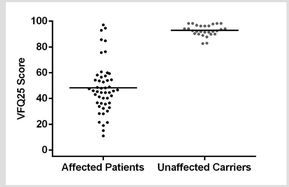


FIGURE 1B: A comparison of VFQ25 scores in affected LHON patients versus unaffected carriers. P value<0.001



VISUAL FUNCTION RESULTS:

- In affected patients, VF-14 and VFQ-25 scores are significantly negatively correlated with age of disease onset (VF-14: r= –0.43, 95%CI –0.63 to –0.16, p=.002; VFQ-25: r= –0.47, 95%CI –0.67 to –0.21, p<.001).
- Both VF-14 and VFQ-25 scores are significantly correlated with disease duration (VF-14, r= 0.49, 95%CI 0.24 to 0.68, p<.001; VFQ-25, r= 0.49, 95%CI 0.23 to 0.68, p<.001).

HADS RESULTS:

- 54% of LHON patients were found to be anxious and 28% of LHON patients were depressed on screening with HADS-Anxiety (HADS-A) and HADS-Depression (HADS-D) respectively.
- There was no significant difference in the mean HADS-A scores between affected patients and unaffected carriers (p=0.90).
- Mean HADS-A scores (7.480, SD 3.90) and HADS-D (5.720, SD 4.126) for LHON patients were greater than the normative UK population scores [7] of 6.14 (SD 3.76) and 3.68 (SD 3.07) respectively.
- A moderate negative correlation was found between disease duration and HADS-D score (r= –0.41, 95%CI –0.62 to –0.14, p=0.003) in affected patients.
- Significant negative correlations were found on both HADS–A and HADS-D with VF14 and the VFQ25 for affected patients (R = -0.3910 to -0.6515).

TABLE 4: Spearman's correlation between HADS-A or HADS-D scores and visual function questionnaire scores, for affected carriers

	AFFECTED CARRIERS				UNAFFECTED CARRIERS			
	HADS – Anxiety		HADS- Depression		HADS- Anxiety		HADS – Depression	
	R	p-value	R	p-value	R	p-value	R	p-value
VFQ14	-0.3910	0.0050	-0.5105	0.0002	-0.1235	0.5314	-0.0775	0.6952
VFQ 25	-0.5721	< 0.0001	-0.6515	< 0.0001	-0.2708	0.1634	0.2845	0.1423

FIGURE 2: Correlation between VF14 scores and VFQ25 scores for affected LHON patients. (R=07781, p< 0.001)

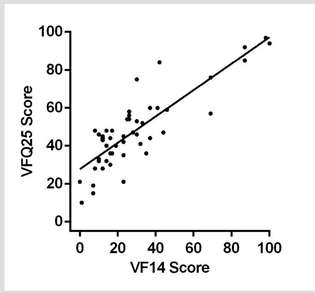
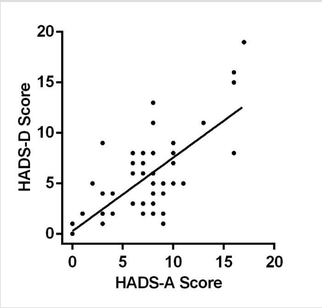


FIGURE 3: Correlation between mean HADS-A and means HADS-D scores for affected patients. (R=0.5455, p<0.0001)



CONCLUSION

- Vision-related quality of life is significantly reduced in LHON patients.
- LHON patients also have higher levels of depressive symptoms compared to unaffected carriers.
- Vision-related quality of life and depressive symptoms correlate with disease duration, suggesting that both may improve as patients adapt to chronic disability.
- HADS-A and HADS-D scores of LHON patients are higher compared to the general population, highlighting their increased risk of anxiety and depression.
- Addressing mental health concerns and promoting enabling skills and strategies that overcome role limitations may improve QoL and mood in LHON patients

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ACKNOWLEDGEMENTS

Thank you to Mr Yu Wai Man, Dr Jared Ching, Dr Benson Chen, Dr Gerard Smits, Newcastle Mitochondrial Research Group and all the families that participated in the study.