THE VALUE OF VISUAL EVOKED POTENTIAL TESTING IN OPERATED CASES OF PRIMARY CONGENITAL GLAUCOMA

Mohamed Saad Morsy, Nader Hussein Lotfy Bayoumi, Mai AbdElnabi Mohamed Elbehwash, Nashwa Shehata Mohamed Zeater

Department of Ophthalmology, Faculty of Medicine, Alexandria University

INTRODUCTION

PCG is a hereditary childhood glaucoma that is not associated with other ocular, systemic congenital anomalies or acquired conditions it accounts for 26–29% of childhood blindness in Egypt.

Glaucoma defined according to CGRN classification as the presence of two of these factors: elevated IOP> 21, optic disc cupping and corneal findings.

PCG commonly presents bilaterally. The classical triad of symptoms is epiphora, photophobia and blepharospasm and the most common presenting sign is Cloudy cornea.

Treatment include medical treatment which role is known to be only supportive to decrease the corneal opacity before surgery or as an adjunct to achieve maximum IOP reduction postoperative. Surgical treatment in the mild form of congenital glaucoma is generally successful, no matter which procedure is chosen but in the moderate and severe forms combined trabeculotomy - trabeculectomy with adjunctive mitomycin C results in better IOP control. Flash VEP is used in uncooperative patients and its latencies are more variable than the pattern reversal type. Therefore, it only tests continuity of the visual pathways from the optic nerve to the occipital cortex.

AIM OF THE WORK

The aim of this study was to report on the results of VEPs testing of the eye in operated cases of primary congenital glaucoma and to compare that to age-matched normal children.

SUBJECTS AND METHODS

SUBJECTS: A total of 36 eyes of 26 patients operated for PCG and controlled and 30 eyes of 22 age matched healthy control children were enrolled in the study

METHODS: The study was conducted as a cross sectional study. The procedure was explained and consent form was signed by the parents of eligible subjects.

The study was conducted in the ophthalmology department of Alexandria Main University Hospital on 36 (19 Right and 17 left) operated PCG eyes of 26 (19 males and 7 females) children attending for follow up and 30 (17 Right and 13 left) eyes of 22 (12 males and 10 females) age matched control children attending for routine ophthalmic examination.

All study participants were subjected to:

Thorough history taking from the care providers including age, gender, diagnosis, type and date of surgical procedure.

Thorough ophthalmic examination, office examination under anesthesia with emphasis on corneal diameter, IOP measurement and disc examination.

Electrophysiological testing in the form of flash VEP was conducted using the RETI-port/scan 21 from the Roland Consult Stasche and Finger GmbH.

RESULTS

Table 1: Comparison between the two periods according to IOP in patient group

IOP	Preoperative (n = 36)		Postoperative (n = 36)		Test of Sig.	p
	No.	%	No.	%		
Method						
P	36	100.0	36	100.0	–	–
Value						
Min. – Max.	8.0 – 31.0		0.0 – 13.0		Z= 5.235*	<0.001*
Mean ± SD.	18.47 ± 5.28		5.22 ± 3.27			
Median (IQR)	18.0 (15.0 –21.50)		5.50 (2.50 –7.0)			

Table 2: Descriptive analysis of the cup disc ratio in two studied periods in the cases

Cup disc ratio	Preoperative (n = 31)	Postoperative (n = 35)	Z	p#
Min. – Max.	0.30 – 1.0	0.0 – 1.0	4.588*	<0.001*
Mean ± SD.	0.69 ± 0.22	0.30 ± 0.32		
Median (IQR)	0.80 (0.50 – 0.85)	0.20 (0.0 – 0.40)		

Table 3: Comparison between the two studied groups according to visual evoked potentials

|	Visual Evoked Potentials	Patients	Control	Test of Sig.	p
Total affected eyes	P2	(n = 36)	(n = 30)		
	Min. – Max.	75.10 – 162.5	90.20 – 124.0	t= 1.511	0.138
	Mean ± SD.	117.1 ± 24.42	110.5 ± 9.06		
	Median (IQR)	110.4(98.2 – 138.6)	112.3(104.3 – 117.4)		
	N1-P1	(n = 36)	(n = 30)		
	Min. – Max.	0.38 – 53.40	0.29 – 40.20	U= 366.50*	0.025*
	Mean ± SD.	8.31 ± 9.81	5.01 ± 7.54		
	Median (IQR)	5.0(3.0 – 11.0)	2.85(1.1 – 5.4)		
	N2-P2	(n = 36)	(n = 30)		
	Min. – Max.	1.80 – 67.70	5.70 – 78.60	U= 385.0*	0.047*
	Mean ± SD.	17.91 ± 12.48	24.32 ± 15.18		
	Median (IQR)	17.35(10.0 – 23.3)	21.85(12.8 – 32.6)		
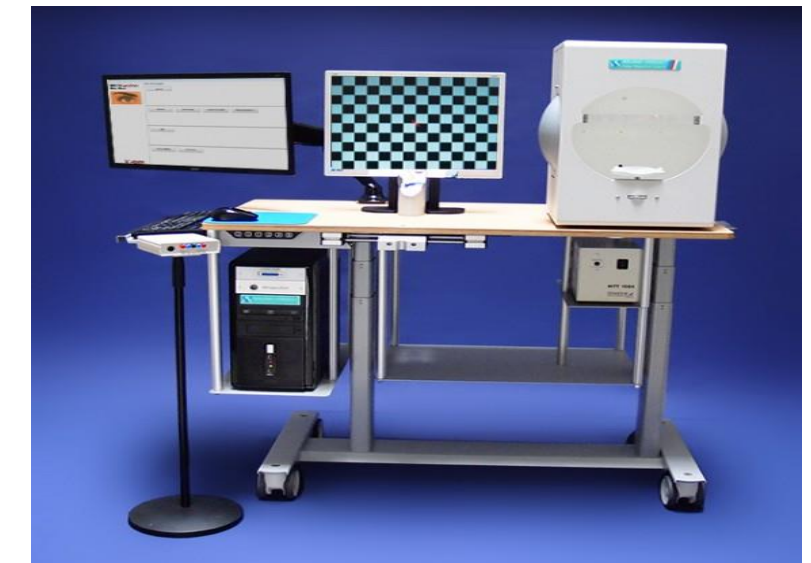
Figure: The RETI-port /scan 21 from the Roland Consult Stasche and Finger GmbH.

Clinical data of all the studied eyes revealed that PCG was controlled by surgery at the time of the VEP testing, as evidenced by reduction of IOP and decrease in cup disc ratio.

The Mean of P2 of total affected eyes was 117.1 for patients and 110.5 for controls which was statistically insignificant (p=0.138).

The Mean of N1P1 of total affected eyes was 8.31 for patients and 5.01 for controls which was statistically significant (p=0.025).

The Mean of N2P2 of total affected eyes was 17.91 for patients and 24.32 for controls which was statistically significant (p=0.047).

CONCLUSION

Operated controlled PCG eyes have VEP parameters that match their normal fellow children thus providing an objective evidence of potentially intact optic nerve function in operated controlled PCG and absence of a deleterious effect of the disease on the optic nerve function.

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