



“FLUORESCEIN DYE DISAPPEARANCE TEST IN PATIENTS WITH EPIPHORA FOR ASSESSMENT OF NASOLACRIMAL DUCT OBSTRUCTION AND ITS CORRELATION WITH SYMPTOMATOLOGY”

Ophthalmology

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ABSTRACT

Introduction: Fluorescein dye disappearance test (FDDT) is a noninvasive, relatively objective and quantitative test for identifying a disorder of the lacrimal drainage system. It is useful for patients with poor compliance, including infants.

Fluorescein dye disappearance test is the most simple methods for assessing functional nasolacrimal duct obstruction (FNDO) clinically
AIM:

1-To assess the role of FDDT in patients with epiphora for pre and post operative assessment of nasolacrimal duct obstruction .

2-To evaluate the correlation of FDDT with symptomatology at different time points

method: All patient presenting to out patient department with complaint of epiphora were included in the study. All subjects underwent FDDT before surgery ,and on day 1, 2nd, 4th and 8th week of surgery. The tearing symptom score (TSS), were evaluated simultaneously at these five time points based on questionnaire.

Result: Total of 54 patients were enrolled in study . There was statistically significant difference between mean values of FDDT and TSS between study group and control preoperatively . There was significant differences in mean values of FDDT and TSS in pre and postoperative assessment in study group

KEYWORDS

Fluorescein Dye Disappearance Test, Epiphora

INTRODUCTION

More than one-third of patients visiting the ophthalmic clinic have tearing or complicated problems associated with tearing (Jones 1966).¹ The cause for the excessive tearing can be related to hyper secretion of tears or from a disorder of the lacrimal drainage system which can be assessed clinically.² Epiphora can be assessed by various methods like irrigation, probing fluorescein dye disappearance test (FDDT), nasal endoscopy, endocanalicular endoscopy, dacryocystography and dacryoscintigraphy.³ Fluorescein dye disappearance test is a noninvasive, relatively objective and quantitative test for identifying a disorder of the lacrimal drainage system. It is useful for patients with poor compliance, including infants.⁴

Nasolacrimal duct obstruction (NLDO) is a disorder in which the symptoms and objective findings do not correlate well. Patients frequently report symptoms of visual blurring, difficulty reading, driving, embarrassment and poor mood due to both functional (FNDO) and primary acquired (PANDO) nasolacrimal duct obstruction.⁵

In the 1994 American Society of Ophthalmic Plastic and Reconstructive Surgery [ASOPR] survey^{5,6} the term "functional" was first used in reference to patients with symptoms of tearing with no obvious mechanical obstruction indicated by normal syringing at a time when the approach to such watery eyes was ill-defined. Irrigation and probing are invasive methods and have difficulty in diagnosing a functional obstruction, although they have been widely used to evaluate NLDO. In particular, FNDO differs from primary acquired nasolacrimal duct obstruction (PANDO) in that FNDO has an anatomical patency of the lacrimal drainage system. Thus, FNDO requires additional tests with irrigation and probing to demonstrate the symptoms of patient objectively.¹ However, if we use only irrigation and probing as a diagnostic test to assess nasolacrimal drainage obstruction, we may miss out many symptomatic patients with functional obstruction who can be benefitted by dacryocystorhinostomy.⁷

Demorest and Milder (1955) demonstrated functional block in a patient with chronic epiphora an indication for dacryocystorhinostomy (DCR) and reported that patients respond just as dramatically as those with an anatomic blockage.⁸ Sahlin and Rose reported a retrospective study of patients with symptomatic epiphora and patent tear ducts, with at least two year follow-up after DCR.⁹ FDDT is the most simple methods for assessing FNDO clinically.^{1,4,10} There are only few studies to assess whether the values of the FDDT changes significantly pre and postoperatively and how FDDT correlates with symptoms.¹¹⁰ With this

background we plan to evaluate FDDT in patients with epiphora for pre and post operative assessment of nasolacrimal duct obstruction and to study its correlation with symptomatology at different time points.

MATERIAL AND METHODS

This was a hospital based cross sectional study. All patient presenting to out patient department with complaint of epiphora were included in the study. Patients with proximal obstructions of the lacrimal drainage system such as punctal stenosis and canalicular obstruction, reflex hyper secretion from eyelid diseases and ocular surface disease (dry eye), traumatic history or surgery of the nasolacrimal apparatus and patient not giving consent were excluded from the study. Patient who fulfilled the eligibility criteria were enrolled in the study after taking informed consent.

All enrolled patients underwent irrigation (syringing) and FDDT. Based on the finding of irrigation, and FDDT, the study group was divided into PANDO and FNDO. All patients underwent the external dacryocystorhinostomy surgery. Few patients attending ophthalmic outpatient for some other problem, who did not had epiphora nor any proof of anatomical obstruction based on irrigation and FDDT were enrolled as controls.

All subjects underwent FDDT before surgery, and thereafter on day 1, 2nd, 4th and 8th week of surgery. The tearing symptom score (TSS), were evaluated simultaneously at these five time points based on questionnaire. The questionnaire regarding tearing symptom consisted of five items. Each item was graded in three levels. Level 1 represented 'mild, level 2 represent 'moderate' while level 3 represented 'severe' (Table 1).

The points for each item (0.33,0.66,1 for mild ,moderate and severe respectively)were summed up and mean was taken as a score.

The values of each parameter (FDDT and TSS) were compared pre and postoperatively and between the types of NLDO (PANDO and FNDO). The values of FDDT and TSS were evaluated to assess if any correlation exist between the two at different time points pre and postoperatively.

The FDDT was performed by placing a drop of 2% Fluorescein dye in the lower fornix of each eye, leaving it for 5 min and grading it in terms of color intensity. No decrease in color intensity is defined as a

residual amount of 4+ based on the Zappia & Milder (1972) classification¹¹, while 1+ or 0 represented minimal or no residual amount of the dye. A residual amount of 2+ to 4+ will be considered as an indication for inadequate lacrimal excretion.

Table: 1 Showing questionnaire for tear symptom score (TSS)

S. no	Questions		Patient's response			
			No	IF YES, HOW MUCH IT BOTHERS		
				A little? (mild)	moderate amount?	great deal? (severe)
1	Does your watery eye interfere with your	Sight				
2		Routine work				
3						
4		Occupational work				
5		Mood				
5	Does your watery eye become socially embarrassing?					

RESULTS

A total of 83 patients were enrolled in study, of which 54 were in study group and 29 control. Among study group 41 belong to primary acquired nasolacrimal duct obstruction (PANDO) and 13 belong to functional nasolacrimal duct obstruction (FNDO). FDDT was positive in 54 patients and syringing was positive in 41 patients. The age and sex between individual subgroups as well as between the study and control groups were comparable. (Table 2)

Table:2 Showing demographic profile of patients

	STUDY GROUP		CONTR OL GROUP	P value (study v/s control group)
	PANDO	FNDO		
EYES(n)	41	13	29	
SEX(M:F)	9:32	5:8	10:19	0.45
P value : 0.35				
MEAN AGE	49.29 ± 9.21	50.38 ± 4.95	48.93 ± 8.37	0.75
P value : 0.68				

The mean preoperative value of FDDT was 2.71 ± 0.46 and 2.61 ± 0.51 in PANDO and FNDO respectively which showed a statistically significant difference (<0.0001) with values in control 0.69 ± 0.47. Similarly mean pre operative values of TSS were 4.48 ± 0.597 and 4.77 ± 0.21 in PANDO and FNDO respectively which showed a statistically significant difference with values in control group 1.08 ± 0.41.

The values of FDDT and TSS in study group (N=54) as well as subgroup (PANDO and FANDO) is described in table 3. There was no significant differences in the mean values of the FDDT and TSS between the subgroups of the study group ; p value > 0.05. On multiple comparison (one way ANOVA TEST), postoperative values of mean FDDT and TSS showed statistically significant difference from the preoperative values at each follow up ; p < 0.05. In addition improvement in epiphora associated symptoms (TSS) were found to be co-related with improvement in FDDT with co-relation coefficient 0.733.

Table:3 showing values of FDDT and TSS in study group and its subgroups at different point of time, pre and post operatively

	PREOP	1 DAY	2 WEEK	4 WEEK	8 WEEK
STUDY GROUP (n=54)					
FDDT	2.68	2.09	1.6	1.08	0.91
TSS	4.55	2.94	2.2	1.79	1.09
SUB GROUPS					
PANDO (n=41)					
FDDT	2.71	2.17	1.6	1.08	0.91
TSS	4.48	2.92	2.16	1.74	0.95
FANDO(n=13)					
FDDT	2.62	1.3	1.38	0.84	0.63
TSS	4.77	2.99	2.33	1.97	1.59

DISCUSSION

Irrespective of syringing and probing FDDT is physiological and non invasive test which can be used in cases of non compliant patients

including children. Guzek et al¹² has described that there is always an obstruction when FDDT results are abnormal but it is always not patent when FDDT results are normal. However our study has not shown any false negative case similar to study by Joon Ho Roh from Korea¹ There was no significant difference in FDDT and TSS values between two subgroups of nasolacrimal duct obstruction. This suggest discrimination between two groups is insignificant from management point of view, however if syringing alone is used for diagnosis of nasolacrimal duct obstruction a significant numbers of patients may be overlooked. In present study FDDT had positive correlation with TSS (co- relation coefficient of 0.73) which quantify severity of symptoms with nasolacrimal duct obstruction

CONCLUSION

FDDT is a simple non invasive cost effective method for diagnosis , pre and post operative assessment in patients with nasolacrimal duct obstruction and. FDDT correlate well with symptoms.

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