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Prevalence of Different Types of Intermittent Exotropia among Exotropic Children at Ain Shams University Ophthalmology Outpatient Clinic

Thesis

Submitted for Partial Fulfillment of Master Degree in Opthalmology

By

Rehab Ahmed Mohamed Sallam

M.B.B.Ch, Ain Shams University

Under supervision of

Prof. Dr. Mohammad Ahmad Rashad

Professor of Ophthalmology

Faculty of Medicine - Ain Shams University

Dr. Ahmed Taha Ismail

Assistant Professor of Ophthalmology

Faculty of Medicine - Ain Shams University

Dr. Noha Mohsen Mahmoud

Lecturer of Ophthalmology

Faculty of Medicine - Ain Shams University

Faculty of Medicine

Ain Shams University

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قال الله تعالى
إِنَّمَا يَخْشَى اللَّهَ مِنْ عِبَادِهِ الْعُلَمَاءُ
إِنَّ اللَّهَ عَزِيزٌ غَفُورٌ
[فاطر : 28]

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Dedication

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List of Contents

List of Tables

List of Figures

Fig. No.	Title	Page No.

List of Abbreviations

Abb.	Full term
AC/A	Accommodation convergence to accommodation.
ARC	Abnormal Retinal Correspondence.
APCT	Alternate Prism Cover Test.
BCVA	Best corrected visual acuity.
BSV	Binocular single vision
Dcc	Distant angle with glasses.
Dsc	Distant angle without glasses.
EOM	Extra ocular muscle.
Ncc	Near angle with glasses.
NRC	Normal Retinal Correspondence.
Nsc	Near angle with glasses.
PD	Prism Diopter.
TPF	Tenacious Proximal Fusion.
VA	Visual acuity.
X(T)	Intermittent exotropia.
XT	Constant exotropia.

INTRODUCTION

Intermittent exotropia X(T) is a disorder of binocular eye movement control, in which one eye intermittently turns outwards, the deviation is most likely to occur at far viewing distances (Divergence excess), when the oculomotor convergence drive is weakest, and occurs most often when the patient is tired, ill, under stress, or in particular test situations ***(Von Noorden and Campos, 2002).*** Intermittent exotropia can also occur at near fixation (convergence insufficiency). Intermittent exotropia is usually diagnosed in early childhood. It is the commonest form of exotropia, with an incidence of 1% in children under 11 years old ***(Hutchinson, 2001).***

In X(T), during the phoric phase, the eyes are perfectly aligned and the patient has bifoveal fusion with excellent stereoacuity. A minority of patients with X(T) do not develop normal bifoveal fusion with good stereopsis. The poor fusion in these cases is associated with a predominance of the tropia phase ***(von Noorden and Campus, 2002).***

Intermittent exotropia has been divided into four groups according to the classification system proposed by Burian**.**This system is based upon the concept of fusional convergence and divergence and relies on measurements of the distance and near deviations.It is classified to basic X(T) which is present when the deviation at distance is within 10 prism diopters (PD) of the near deviation, Divergence excess which is present when the

distance deviation is 10 PD or more than the near deviation. Simulated or pseudo-divergence excess, when the patient has a larger deviation at distance than near but the near deviation increases within 10 PD of the distance deviation after 30-60 min of monocular occlusion, true divergence excess is present when the divergence excess persists even after prolonged binocular dissociation by monocular patching, and convergence insufficiency which is present when the near deviation is 10 PD or more than the distance deviation ***(Burian, 1966).***

The prevalence and subtypes for X(T), in preschool children aged 3 to 6 years in eastern China,were estimated among 166 children with X(T), the "basic type" was the most common type of X(T) (74.7%), the "divergence excess" was the second (19.9%), whereas the "convergence weakness" was the rarest (5.4%) ***(Pan et al, 2016).***

Aim of the Work

The aim of this work is to assess the prevalence of intermittent exotropia and each type among exotropic children attending Ain Shams University ophthalmology outpatient clinic.

Chapter 1

PHYSIOLOGY OF EYE MOVEMENTS

Types of Eye Movements

Types of eye movements are uniocular eye movements "Ductions", binocular conjugate eye movements "version" and binocular disconjugate eye movements "vergence". In uniocular movements "ductions" only one eye is open, the other is covered/closed, it is tested by asking the patient to follow a target in each direction of gaze. Binocular movements "versions" are binocular, simultaneous, conjugate movements in the same direction, where both eyes are open, attempting to fixate a target and moving in same direction. Types of versions are dextroversion, levoversion, elevation, depression, dextroelevation, dextrodepression, Levoelevation & levodepression. Vergences are binocular, simultaneous, disconjugate movements. Convergence is simultaneous adduction and divergence is outward movement from convergent position ***(Karatas, 2009).***

Vergence system

The vergence system is disjunctive eye movements responsible for the convergence and divergence movement of the eyes allowing the visual system to fuse stimuli moving in depth. This disjunctive movement of the eyes is facilitated by the medial and lateral recti muscles which rotate the globes