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# INHERITANCE OF STRABISMUS

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF

THE MASTER DEGREE IN

GENETICS

BY

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

مَا لَوْ سَجَّافَتْ لَعَلَّمْنَا بِمَا عَالَمُنَا  
رُفَاتٍ أَنْتَ الْعَالِمُ الْحَكِيمُ

مَدَقَاتُ الْعُضْمِ

سُورَةُ الْبَقَرَةِ - آيَةُ ٣٢



**TO MY MOTHER . . .**

**TO MY BROTHER MOHAMED....**

**AND MY SISTER LOLA ....**

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## DEFINITIONS

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Visual line of the eye;(or axis): Is an imaginary line that connects an object in space [fixation point] with the fovea centralis. In normal eyes, the two visual lines intersect at the fixation point and there is binocular fixation [Newell, 1978].

Ductions: Monocular rotations [other eye is covered]

Adduction: Inward rotation.

Abduction: Outward rotation.

Infraduction: Downward movement.

Supraduction: upward movement.

Fusion: The cortical integration of the image received simultaneously by the 2 eyes.

Heterophoria: (or phoria): A deviation of the eyes corrected by the fusion mechanism. [Latent squint] .

Esophoria: Tendency for one eye to turn inwards.

Exophoria: Tendency for one eye to turn outwards.

Hyperphoria: Tendency for one eye to deviate upwards.

Hypophoria : Tendency for one eye to deviate downwards.

[Gonzalez,1983]

Heterotropia: (or tropia) manifest strabismus or "squint"; deviation of the eye not corrected by the fusion mechanism.

Esotropia: "Crossed eyes"; convergent strabismus (one eye deviates in).

Exotropia; "Wall eyes"; Divergent strabismus [One eye deviates out].

Hypertropia: Deviation of one eye upwards.

Hypotropia: Deviation of one eye downwards. By common usage one usually refers to a vertical deviation in terms of hypertropia rather than hypotropia.

Orthophoria: The absence of any tendency of either eye to deviate when fusion is suspended. This state is rarely seen clinically. A small degree of phoria is "normal" [Vaughan and Asbury, 1980].

Comitance: This refers to equal deviation in all directions of gaze [Newell, 1978].

Torsions : Wheel-like motion of the eye on its anteroposterior axis.

Intorsion: (incycloduction); torsion of superior limbus toward the nose.

Extorsion: (excycloduction); torsion of superior limbus away from the nose.

Vergences : (disjunctive movements); movement of the 2 eyes in opposite directions.

Convergence: The eyes turn inwards.

Divergence: The eyes turn outwards.

Versions : Binocular voluntary movement of the eyes in conjugate gaze .



Dextroversion: Movement of the eyes to the right.

Levoversion : Movement of the eyes to the left.

Supraversion: Movement of the eyes up.

Infraversion: Movement of the eyes down.

[ Vaughan and Asbury, 1980].

Amblyopia : Decreased vision in an otherwise normal eye that cannot be improved with glasses.

The term " an otherwise normal eye" means an eye that ophthalmoscopically seems to be perfectly normal.

Habitual suppression of one eye results in amblyopia [Hamming and Apple, 1980].

## INTRODUCTION

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Strabismus is misalignment of visual axes of the eye which can be horizontal or vertical. The deviation can be kept latent by fusional mechanisms or become manifest as a heterotropia [Isenberg, 1983].

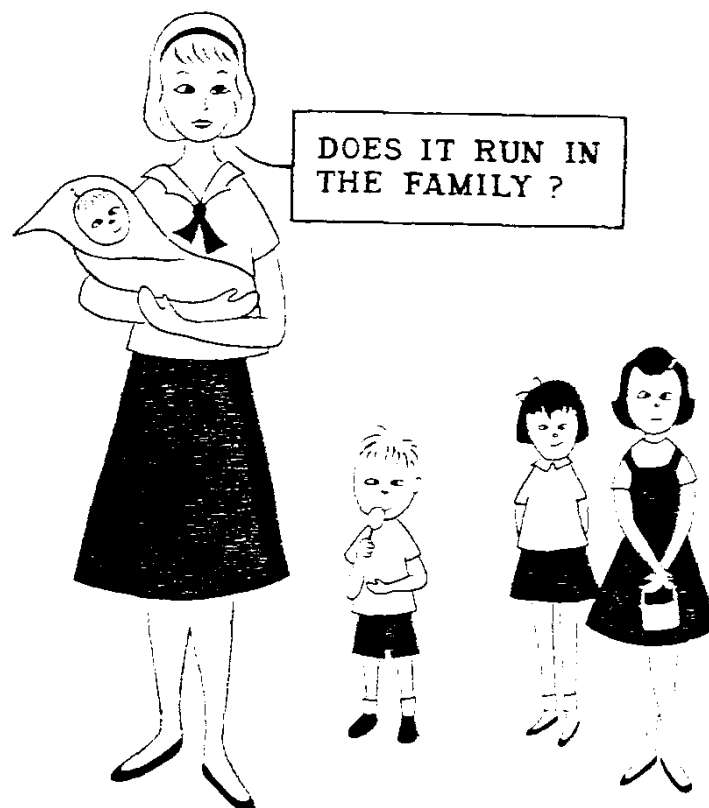
Strabismus is a common childhood disorder which is underdiagnosed and undertreated. Early detection and treatment will enable normal binocular functions to be achieved in many children [Elston and Lee, 1985].

Patients informed of the hereditary nature of strabismus may be able to bring subsequent children for earlier medical care, thereby avoiding the development of severe suppression amblyopia Fig.(1) [Havener, 1979].

When examining a population with strabismus which is not secondary to another ocular or non-ocular cause, it is often difficult to provide genetic counselling because of the lack of a clear genetic pattern.

For cases of strabismus which can be categorised into a more specific strabismic or systemic syndrome more predictable inheritance pattern is available . [Isenberg, 1983].

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[Fig.1] Patients informed of the hereditary nature of strabismus may be able to bring subsequent children for earlier medical care, thereby avoiding the development of severe suppression amblyopia.

## AIM OF THE WORK

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early detection  
and prevention

Our aim is to throw more light on the genetic aspects of strabismus in Egypt in order to offer better counselling to the affected families , guided by the pedigrees constructed for some patients.

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**REVIEW  
OF  
LITERATURE**

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