DIAGNOSIS OF AMBLYOPIA

THESIS

Submitted in partial fulfilment

of the requirements for the

Master Degree in Ophthalmology

By

Medhat Moh. Nur El Din Nagger

M.B.B.CH.

Supervised by

Professor Dr.

Wafik Nefky

Chairman of Ophthalmology departements

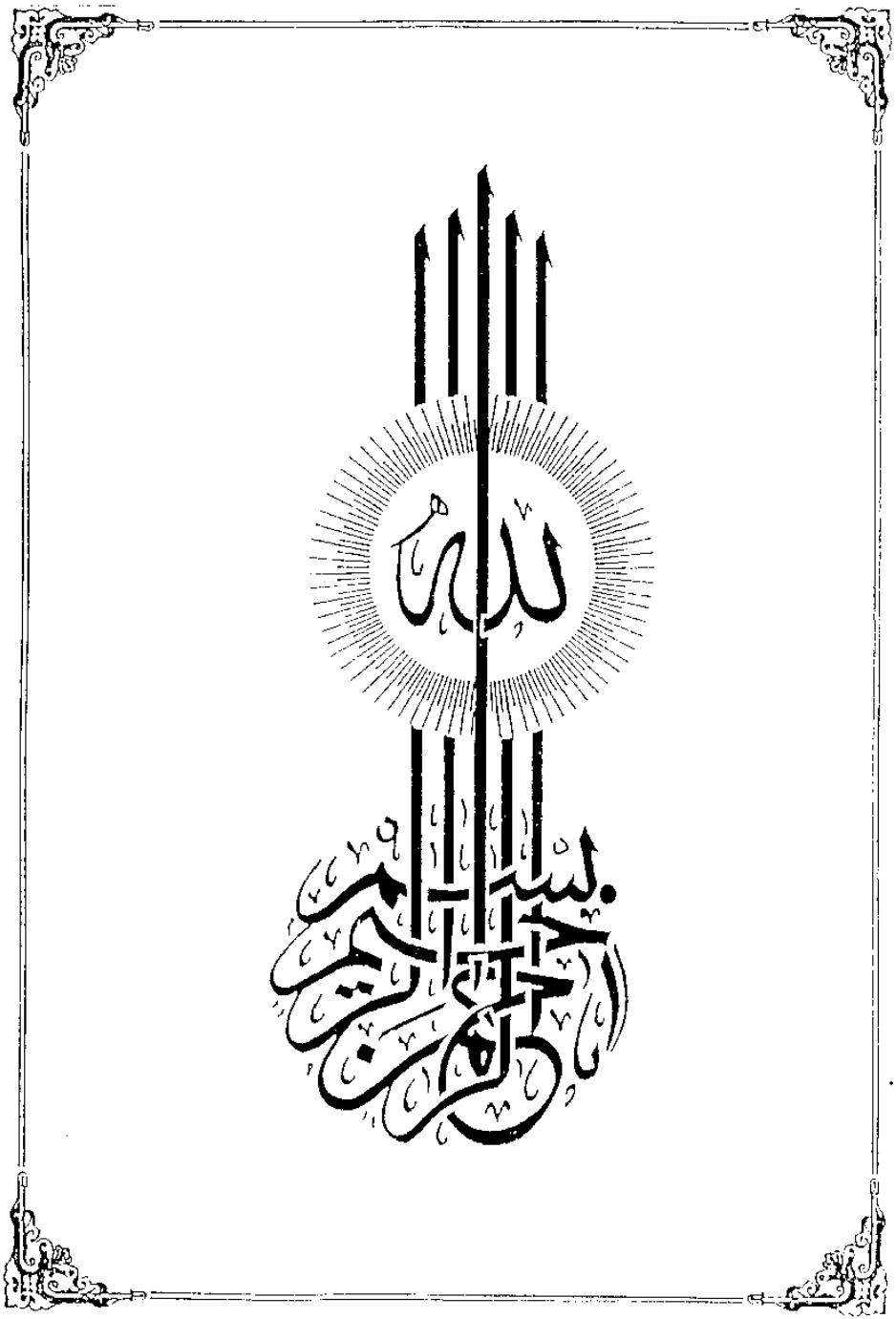
Faculty of Medicine

Ain Shams University

-1982-

Acknoledgement

I wish to express my great indebtedness & sincere appreciation to Prof. Dr. Wafik Nefny Chairman of Ophthalmology departement , Faculty of Medicine , Ain Shams University who kindly suggested the subject & who personally supervised the work & for his kind help , indispensable advice & continuous encouragement which made this work possible .



CONTENTS

DIAGNOSIS OF AMBLYOPIA

Definition of amblyopia

According to Plenk 1788 , amblyopia is derived from Greek word "amblys" which means trouble & "ops" which means eye .(Thomas 1966)

Amblyopia means defective vision without any organic detectable aetiology in the eye , visual pathway ,or visual cortex . It commonly develops during the first five years of life before the visual apparatus is completely developed . (Von Noorden 1974) .

Amblyopia is also considered as a state of vision between normal vision & amaurosis .

Amblyopia also can be defined as reduction of vision in an eye in absence of any detectable ophthalmoscopically retinal anomaly or any disorder of the afferent visual pathways which might cause the defect .(Duke Elder 1973)

Classification & different varieties of amblyopia :-

Amblyopia can be classified to :-

(1) Organic type :- due to presence of an organic lesion in the eye .

(2) Functional type :- in which the ocular apparatus is completely normal while ocular function is impaired .

To differentiate between organic & functional amblyopia , a dark filter is put infront of the amblyopic eye . In cases of organic amblyopia , the visual acuity will be diminished in contrast of that of functional amblyopia .

Amblyopia can be classified according to its cause to:-

(1) Strabismic amblyopia :-

- It occurs due to the presence of ocular deviation , the squinting eye forms a blurred image causing dissimilar images to be presented to the two foveae . Then ,facultative suppression of the blurred image develops to prevent

the resultant diplopia . After sometime , this suppression becomes obligatory & amblyopia results .

- It can be classified to two types :-

(a) amblyopia of arrest occuring as aresult of squint since birth or early childhood before any useful vision is attained . But this term is not correct because many children below the age of six months show good visual acuity if it is properly measured .

(b) amblyopia of extinction occuring later in life & is accompanied with loss of all or part of vision developed before the onset of squint .

(2) amblyopia exanopsia :-

- It represents any diminution of vision developing in early life whether caused by visual inhibition e.g. in congenital cataract , ptosis or corneal opacity leading to lack of formation of retinal images in early life. This type of amblyopia is also called stimulus deprivation

amblyopia & it occurs due to disuse of the eye . (Noorden 1968 & 1971) . Corneal transplantation in children is necessary to be done early if opacity is present to restore vision . (Gordon Y.K. 1979)

(3) anisometropic amblyopia :-

- Anisometropia includes cases in which there is difference in refraction between the two eyes which may be as low as 1 D & may be up to 35 D .

- The difference up to 3 D is common (Hofny 1972)

- Gupta (1973) also considered that if the difference in refraction between the two eyes is 3 D. or more ,there is anisometropia .

- Anisometropia is classified to :- (Hofny 1972)

(a) Simple where one eye is emmetropic while the other eye is either hypermetropic or myopic .

(b) compound where both eyes are either hypermetropic or myopic to different degree .

(c) mixed where one eye is myopic while the other eye is hypermetropic .

(d) simple or compound astigmatic anisometropia .

- Vision in anisometropia may be binocular , uniocular or alternating .

- Binocular vision is present in small degrees of anisometropia with difference in size of retinal images up to 5% (2.5 D difference) . If difference is in excess of this , binocular vision becomes difficult & diplopia results . Thus to escape from such situation suppression of one eye occurs especially if occurs at an early age & comfort is attained through uniocularvision. (Refuy 1972)

- The process is due to central suppression of facultative type which gradually becomes fixed or obligatory leading to constant amblyopia .

- In cases of mixed anisometropia , alternating vision results where hypermetropic eye is used for distant vision

while myopic eye is used for near vision .

- Anisometropia of more than 2 to 3 D is sufficient to cause amblyopia . (Duke Elder 1973)

(4) Toxic amblyopia :-

- A heterogeneous collection of organic substances , some of them in common use industrially , therapeutically or in everyday life , may cause considerable visual damage by their action on the ganglion cells of the retina or the optic nerve fibres .

- These toxic substances can be classified to toxins producing central scotoma e.g. tobacco , ethyl alcohol & iodoform , toxins producing constriction of peripheral field of vision e.g. overdose of quinine , salicylates & barbiturates , & toxins producing optic atrophy e.g. methyl alcohol , lead , arsenic & filix mas (used as anti-helmentic) .

- tobacco amblyopia :-

It occurs due to exessive use of tobacco either by smoking or chewing for many years (Musemann 1894) . Cigarette smokers are rarely affected (Van Millinger 1888 & Mayerhoff 1921) . Also by tobacco dust absorption in tobacco factories . Avitaminosis of vitamin B_1 & B_{12} is common . The pathogenesis of this type of amblyopia is due toxic decomposition products of nicotine on ganglionic cells but now it is thought to be due to poising of the ganglion cells with cyanide in tobacco smoke associated with deficiency of vitamin B_{12} . It is characterized clinically by bilateral impairement of central vision with development of centrocaecal scotoma initially for red & green with an intact peripheral field & without ophthalmoscopic abnormalities . It is characterized by pathological degeneration of ganglion cells in the macula & the fibres of optic nerve particularly associated with papamacular bundle.

(Duke Elder 1954)

- Quinine amblyopia :-

Quinine is used for ttt. of malaria & as abortifacient . Small doses as 7 gmmay lead to blindness . Its toxicity is characterized by tinnitus , deafness , followed by marked reduction of vision , pupils are dilated & fixed , fundus shows narrowing of retinal vessels with marked pallor of disc , retinal oedema in early stages has been described & cherry red spot is seen i.e. picture similar to central retinal artery occlusion . There is also marked peripheral field contraction & tubular field may occur . Its fate may be by partial recovery with tubular vision or complete blindness with atrophy may result . (Duke Elder 1967)

- Methyl alcohol amblyopia :-

It occurs due to inhilation of its fumes , rarely by skin absorption or by ingestion of methyl alcohol (wood alcohol) which is common in countries during prohibition

& also occur sporadical from drinking methylated spirit .

It is characterizes by nausea , vomiting , headache , giddiness , coma & then death occurs in acute cases .

But in chronic cases there is diminution of vision very rapidly with contraction of visual field leading to absolute central scotoma with blindness . The vision may improve but relapses usually occur leading to progressive optic atrophy of primary type . It is due to breakdown of methyl alcohol in the body by oxidation to form formaldehyde & formic acid causing acidosis & anoxia leading to wide spread degeneration of ganglion cells & nerve fibres (Uhoenberg 1914)

(5) Nutritional amblyopia :-

- It occurs due to deficiency of many nutrients in the diet .

- It may occur due to deficiency of one or more members

of vitamin B group , or of protein or perhaps may be due to deficiency of both .

- The majority of writers believe that it is due to vitamin B_1 deficiency but others believe that it is due to nicotinic acid or riboflavin deficiency . There is recent evidence that this condition is associated with deficiency of vitamin B_{12} .

- The patient is always malnourished & may be suffering from or having a history of Beri-Beri or pellagra .

- In some cases , nutritional amblyopia is the only sign of deficiency . There may be a history of malaria or dysentry . The main symptom is failing of vision gradually but occasionally suddenly with a complaint of inability to read or to recognize people , headache or pain may occur but not a constant symptom .

- By examination , visual acuity may drop to 6/60 or less . The changes in the fundus vary greatly . The

most constant but not inevitable , is pallor of the disc especially on the temporal side & the degree of pallor is not associated with degree of visual impairement .

The fundus also may be normal , some workers described narrowing of vessels , the macula is occasionally affected .

There is usually central scotoma but often paracentral .

The greater area of scotoma is usually on the temporal side . (Sorsby 1972)

(6) Congenital amblyopia :-

- It is applied to the type which occurs from birth in the apperent absence of retinal or central nervous lesions , a circumstance which points to the presence of an undetectable lesion .

- The sudden arrest of visual impairement after a certain point during ttt , sugnest that organic damage to the retina & visual pathway is the determining cause .