INTRODUCTION AND REVIEW

Anisometropia

Definition:

Anisometropia is the term applied to that condition wherein the total refractions of the two eyes are unequal. This difference may be as low as 1 D. and may reach up to 35 D., the difference up to 3 D. is common (Hefni, 1972).

Classification:

Joseph (1936), proposed the following classification:-

(A) Absolute anisometropia:- which may be :-

1- Simple :- One eye is emmetropic and the other is hypermetropic or myopic.

2- Compound :- Both eyes are unequally myopic or hypermetropic.

3- Mixed :- One eye is hypermetropic and the other is myopic.

4- Simple astigmatic:- One eye is emmetropic and the other is astigmatic.

5- Compound astigmatic:- Both eyes are unequally astigmatic.

(B) Relative anisometropia=- Wherein the total refractions of the two eyes is equal or approximately so, but the component elements in each show large differences.

Aetiology of anisometropia:-

Anisometropia is clearly genetically determined and the hereditary factors which act on the two eyes determining the differing refractions are as abscure as those which in other subjects dictate that the refractions will be similar.

As far as the actual components of refractions are concerned, the axial length is the most significant factor in determing anisometropia.

Both the cornea and the lens exert less influence and of the two the lens is the more important, but in some cases the cornea may even counteract the anisometropic influence of the axial length (Duke Elder, 1970).

The incidence of anisometropia:-

In the clinical sense the two eyes are usually very much alike considering the variability of the optical components in the refractive system.

In higher degrees of refractive errors differences up to 3 D are common and disparities up to 36 D have been recorded (Oliver, 1921).

McNeil (1955), examined 1220 children of all ages referred by their schools for routine examination. He found 109 children to be anisometropic (8.93%). Here were included cases with a difference of 2 D or more in a spherical or sphero-cylindrical error and 1.50 D or more in an astigmatic error.

In a study on the incidence of refractive errors in Egypt, Gawdat (1976), examined 1401 patients, the age group extending between 18 years old up to 40 years. He found that the incidence of anisometropia more than 4 D is 0.908% and it was more common in females than males (69.78%).

Ingram et al. (1979), refracted a sample of 186 1-year-old children under a cycloplegic. They delayed reporting their findings in order to have some indication of how effective the procedure might be in terms of predicting visual problems. They found that 7.0% of the children had anisometropia at age of 1 year, (considered anisometropia as 1 D in spherical or cylindrical difference), but what is more important, they found that anisometropia both "disappeared" and "appeared" between the ages of 1 and $3\frac{1}{2}$ years. Of the percentage of children who had anisometropia at age of 1 year, 7 no longer had it at age of $3\frac{1}{2}$ years. Eight children who did not have anisometropia at age of 1 year had anisometropia at $3\frac{1}{2}$ years. Five of them did not have amblyopia. They do not know whether the 3 who were amblyopic had anisometropia before the age of 1 year.

Vision in anisometropia:

(1) Binocular vision:- It is the rule in the smaller degrees of the defect. Each 0.25 D difference between the refraction of the two eyes causes 0.5% difference in size between the two retinal

images, and a difference of 5 per cent is the limit which can be tolerated. Moreover, since the power of accomodation acts equally in both eyes and is not dissociated, the image of one eye is always blurred and the patient tries to combine the two images to obtain a stereoscopic effect. With the higher grades of error, fusion is impossible.

(2) Alternating vision:- This is especially apt to occur when both eyes have good visual acuity and when one is emmetropic or moderately hypermetropic and the other is myopic. In these circumstances the patient uses the former for distant vision and the latter for near work.

(3) On the other hand, if the defect in one eye is high, it may be excluded altogether from vision at an early stage in life. The more ametropic eye tends to become amblyopic, the image from it being suppressed. This amblyopia from disuse (amblyopia ex anopsia is in most cases a preventable condition,

since useful vision may be retained if the error in the defective eye encouraged early enough in life and the use of the eye encouraged at that time by suitable exercises (Duke-Elder, 1978).