

Convergence Insufficiency Small Element with Big Problem

Dr. Madan Mohan Mahapatra

Professor Ophthalmology, IMS & SUM Hospital, Bhubaneswar

Convergence insufficiency is one of the most common cause of ocular discomfort and in fact is the most common cause of muscular Asthenopia, therefore it is of considerable clinical significance.

Aetiology :

There is frequently an aetiological connection associated with accommodative difficulties as following.

- i. It may be due to disuse of accommodative convergence mechanism caused by uncorrected high hypermetropia more than 5-6 D and myopia. In this high hypermetropia patient makes little or no effort to accommodate and in myopia there is no need to accommodate.
- ii. While using glasses for the first time in presbiopia the relief of sustained accommodative effort decreases the accommodative convergence effort and a previous exophoria that has been controlled by accommodative convergence may become manifest as convergence Insufficiency. In other patients without refractive problem the condition may arise without obvious cause.
- iii. Previously some ophthalmologists were thinking convergence insufficiency to be neurogenic, but with proper evaluation and therapy there was improvement of near point of convergence and fusional convergence amplitude. So the neurogenic cause was not fully acceptable.
- iv. Rarely instances of acquired convergence insufficiency may occur on organic basis secondary to sub dural hematoma.
- v. Anatomical Factors- Factors like large pupillary

distance or a divergent position of anatomical rest may be a cause.

- vi. Developmental (phylogenetic factor) convergence is the most recently developed aspect of binocular vision and can most readily break down under stress.
- vii. Squint:- Divergent squint in early part of life may be a cause. But recent survey shows that convergence insufficiency is present in both convergence and divergent squint.
- viii. Disuse of Eye:- Disuse of any one of the eye for any length of time like amblyopia can also induce convergence insufficiency and may be a factor for squint.
- ix. General Debility:- ill health, metabolic disorder, toxic conditions, local infection are causes of convergence insufficiency.

Clinical Features :

Symptoms: Symptoms arising from convergence insufficiency were described by Vongraffe in 1855. Symptoms were associated with near vision and consist of tired eyes, eye strain and sensation of tension in and around the globe. After brief period of reading the letters will be blurred and run together and may experience crossed diplopia. Sometimes patients will either close or cover one eye to get relief of pain. There may be ocular headache.

Signs & Examination Procedures: Anterior segment examination may be orthophoric, exophoric or esophoric not exceeding 2-4 prism diaptor for distance and usually exophoric for near vision. This condition is

not really a type of exophoria although it may coexist with any heterophoria. Patients with true convergence insufficiency may have a convergence near point that is more remote than 20-25 cm.

Most of the time convergence insufficiency may be associated with certain amount of refractive error which has to be assessed properly.

Near point of convergence to be determined by an accommodative target ideally by the RAF Gauge or the point an ordinary pencil. Observe the starting point of diplopia when the target is brought nearer to his nose on midline.

Do a cover/uncover and alternate cover test to detect phorias. Measure the patient's fusional ability.

Convergence tests which help for major diagnosis are near point of convergence which is normally less than 10 cm

Jump convergence : The patient is asked to look at a distance object and then asked for fixation to a target held at 15 cm from the eye on the median line. The eyes are observed if the change of convergence is performed satisfactorily. Normally prompt and smooth convergence movement from distant fixation to near fixation is seen.

Range of convergence can also be assessed in a synoptophore by using the foveal fusional slides. Normal convergence is 25-35 degree and divergence is 5-7 degree.

Management: Convergence insufficiency seldom becomes a clinical problem until the patient reaches the teen age years. Aim of the treatment is to make the patient symptom free, recognise diplopia when convergence falls and be able to maintain convergence for several seconds when the target is slowly brought closer from 50 cm to about 6-8 cm near to nose.

Basic orthoptic exercise at home :

Gradual Convergence-: Here a small target of interest from about 50cm distance (about arms length) is brought near till onset of diplopia and then he is asked to fuse the images for few seconds at this point. If diplopia gets early the target may be pushed little farther for fusion.

Jump convergence : The patient is taught to change fixation from near target to a distant fixation target and viceverse.

Correction of any refractive error is necessary and sometimes base in prism can be given if it is of accommodative convergence excess. 5-6 sitting of convergence exercise in the synoptophore can improve convergence insufficiency satisfactorily.

Surgery is indicated only if there is exophoria for distance. Resection of both medial rectus may be done in intractable patients.

Reference :

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