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Amblyopia treatment reevaluated

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Amblyopia is the condition of acquired deficit in the visual maturation during childhood. Mostly it is unilateral. The amblyopic (lazy) eye displays a lower visual acuity than the other eye as well as a crowding phenomenon. It is one of the most common causes of monocular visual impairment in children to middle-aged adults.

Causes of amblyopia include strabismus, anisometropia, isoametropia, and visual deprivation due to obstruction of the light pathway via ocular media. It has long been advocated that the treatment should be applied as soon as the condition was detected. If left untreated, the visual disability would be permanent. The results from a well-conducted systematic review published in 1997 has raised a question whether the belief was true since there was insufficient evidence to conclude the effectiveness of amblyopia treatment.[1] Moreover, there is diversity on the recommendation of treatment modalities.

Generally, treatments of amblyopia are primarily to force the use of the worse eye after correction of any correctable causes, and to limit the use of the better eye by either mechanical occlusion (patching) or defocusing by using long acting cycloplegic eye drop (penalization). The interest in prescribing systemic medications such as levodopa/carbidopa and citicoline which are targeted to improve the neurotransmission at the cortical level, and hopefully, to restore the vision in the amblyopic eye has faded quickly due to the unpromising results.

Although occlusion has been the mainstay of treatment of this condition for decades, there were few good trials with robust conclusion regarding the time period of treatment to achieve effective outcome. Most guidelines recommend the dosage of treatment to be full-time patching for one week per year of the patient's age in the first visit, but still, in real life, expert opinions vary on the issues of when, how, and for how long the amblyopic eye should be occluded. Another question is about the effectiveness of penalization in comparison with patching.

Recently, several clinical trials concerning patching regimen were published, for example: two papers from the Pediatric Eye Disease Investigator Group (PEDIG) in the United States who studied moderate [2] and severe [3] amblyopia in children younger than 7 years old with the most common causes of amblyopia, i.e. strabismus, anisometropia, and combined; a study from the United Kingdom that recruited children aged 3 to 5 years who were detected by preschool vision screening.[4] Interestingly, the results pointed towards the same direction, i.e. successful treatment can be achieved with lower dosages of patching than previously recommended.

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Mild amblyopia (20/30 to 20/40) may not need immediate treatment.[4] Moderate amblyopia (20/40 to 20/100) responded to a 2-hour patching daily in the same magnitude as to a 6-hour patching regimen.[2] Severe amblyopia (20/100 to 20/400) needed only 6 hours of patching per day to obtain a similar result as the entire day occlusion.[3]

Another PEDIG study compared patching for at least 6 hours with penalization by using atropine sulphate in children with moderate amblyopia.[5] After 6 months, by either way of limiting the use of the sound eye, the visual acuity in the amblyopic eye can be raised to a satisfied level. However, with patching, the results tend to be achieved sooner.

The preliminary results from the study published earlier this year evaluated amblyopia treatment in children of 10 to 18 years old and showed that with at least 2 hours of patching for 2 months, vision can be improved.[6] Further ongoing studies from the PEDIG relating to occlusion include a recurrence observation study to identify recurrence rate after successful treatment and a trial comparing glasses to glasses plus patching. We expect the results to come out serially in the near future.

In summary, with the recent evidences we have, the concept of the amblyopia treatment is virtually unchanged but with the dosages more refined.

Conflict of interest: none

References

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