Are there more exotropes than esotropes in Hong Kong?

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Yes, but are Asian children more likely to be exotropic than white children?

I
t is well known that there are marked differences in the prevalence of certain ocular disorders among various ethnic groups. These differences probably reflect the unique genetic make-up of these ethnic groups coupled with a variety of environmental influences. Ethnic variations are particularly marked for the prevalence of myopia and hyperopia. While population based studies from the United States and Australia have reported a prevalence of myopia ranging from 15–26% in adults, the prevalence has been reported to be significantly higher in Singapore (35%). Asian countries in particular have also been experiencing a dramatic increase in the prevalence of myopia. For example, 82% of all ethnic Chinese Singapore military recruits screened between July 1996 and June 1997 were myopic.

In this issue of the BJO (p 854), Yu and coworkers report that the incidence of exotropia is twice as common as esotropia in the strabismus clinic at the Hong Kong Eye Hospital, whereas studies based in Europe and North America have reported a much higher percentage of esotropes than exotropes. In addition, Yu and coworkers report that the ratio of exotropia/esotropia in Hong Kong has increased dramatically over the past decade. How can these differences be explained?

Firstly, the increased incidence of exotropia in Hong Kong may reflect a difference in the prevalence of certain refractive errors among Chinese children that are risk factors for the development of various types of strabismus. The Refractive Error Study in Children, a population based study sponsored by the World Health Organization, elucidated some important differences between the refractive errors of Asian and white children. The study compared the prevalence of refractive errors among children 5–15 years of age in China, Nepal, and Chile. Interestingly, the prevalence of myopia did not differ markedly between 5 year olds in these countries (China <1%; Nepal <2%; Chile 3.3%); however, the prevalence of myopia was much higher in Chinese 15 year olds (males 2%; females 1%) and Chile (males 20%; females 15%). Conversely, the incidence of moderate or high hyperopia (>2 D) in children 5–7 years of age was much higher in Chile (Nepal 1.1%; China 8.5%; Chile 21.6%). The higher percentage of moderate and high hyperopes in Chile would suggest that white populations are more likely to be hyperopic than Asian populations. Since a close linkage between accommodative esotropia and hyperopia has been established, it is not surprising that a higher percentage of white than Asian patients would become esotropic, particularly since the majority of esotropic children have accommodative esotropia. It is less clear if the increasing incidence of myopia in Asian children can account for the increasing ratio of exotropes to esotropes in Hong Kong.

Esotropia is probably higher in white than in Asian children because white children are more likely to be moderate or high hyperopes

While a linkage between myopia and intermittent exotropia in children may exist, the linkage is largely inferential. Kushner reported a mean initial refractive error of 0.0 (SD 1.40) D in a group of children with intermittent exotropia when 4.4 years of age, whereas 4 year old non-strabismic children in Boston had a mean refractive error of +1.13 (0.85) D, and 5 year old children in Chile a mean refractive error of +1.3 D. In addition to being less hyperopic when initially diagnosed, intermittent exotropes tend to become more myopic over time compared to age matched controls. After a 5 year follow up, the intermittent exotropes in Kushner’s study had a mean refractive error of −1.40 (2.80) D and after a 10 year follow up a mean refractive error of −2.41 (2.20) D, whereas boys in Chile had a mean refractive error of +1.1 D when 10 years of age and +0.2 D when 15 years of age. Since most children with intermittent exotropia became symptomatic by the age of 5 years, the low incidence of myopia even in Chinese children when 5 years of age, would argue against the increasing incidence of myopia in older children being a significant factor accounting for the increasing incidence of exotropia in Hong Kong. More likely, a decreasing incidence of moderate or high hyperopic refractive errors has resulted in fewer patients developing accommodative esotropia, thereby increasing the ratio of exotropes to esotropes. This may also explain why Yu and coworkers found an increasing proportion of non-accommodative to accommodative esotropes in Hong Kong over the past decade.

A second possible factor to explain the higher ratio of exotropes to esotropes in Hong Kong relative to the North American and European studies cited may be the demographics of the patients studied. Yu and coworkers included in their study all patients 19 years of age or younger presenting to their clinic with strabismus, whereas the studies cited from North America and Europe included only patients who were 7 years of age or younger. Since two of the most common types of esotropia (accommodative and infantile) almost never present after the age of 7 years, whereas both intermittent and sensory esotropia may develop in older children, there would be an inherent bias in Yu’s study to have an increased ratio of exotropes to esotropes. However, it seems unlikely that this can fully account for the high ratio of exotropes to esotropes in Yu’s study since Ing and Pang have reported an increased prevalence of exotropes compared to esotropes in Asian children 7 years of age or younger.

In conclusion, esotropia is probably higher in white than in Asian children because white children are more likely to be moderate or high hyperopes. It is less clear if the prevalence of exotropia is more common in Asian than in white children. Careful population based studies would be the best means of elucidating true differences in the prevalence of different forms of strabismus among Asian and white children. While the recently completed Refractive Error Study in Children included an ocular motility evaluation, only cursory data are provided which do not allow a meaningful comparison to be made between Asian and white children. So are there more exotropes than esotropes in Hong Kong? Yes. But are Asian children more likely to be exotropic than white children? We’ll have to wait to find out.

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REFERENCES
POAG. In the population based Rotterdam Study, different commonly used criteria for the diagnosis of POAG resulted in prevalence figures ranging from 0.1% to 1.2%. Millions of people all over the world are treated for glaucoma—in the United States more than one million. Bohn et al have shown that in almost half (44.7%) of 544 patients who were treated for POAG, the only parameter used for diagnosis was IOP. As long as there are no accepted criteria for glaucoma diagnosis the correct time for first medical intervention is unclear and studies are difficult to compare. The same problem arises as we try to compare various screening methods and calculate their sensitivity and specificity. Furthermore, no method can detect all glaucoma cases. The sensitivity and specificity is falsified, as some people who have glaucoma and who are detected with one method will not be detected by another method and vice versa. Actually, what we are measuring is the ability of a method to detect the patients who were classified as having glaucoma with another method, which is inaccurate in itself, but not the overall ability to detect the pathology. To minimise those problems a classification and definition system should be agreed upon.

A final remark, over the years it has been suggested that the diagnostic tools enable us to detect glaucoma much earlier. Is it not time to implement these methods and to do new population based incidence and prevalence studies of glaucoma with the new diagnostic devices? I would expect a shift to the left of the age distribution. Glaucoma is ready for an update.


REFERENCES

A few remarks about glaucoma

A Wegner

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