Effectiveness of preschool vision screening

The ninth systematic review (Snowdon and Stewart-Brown 1997) from the NHS Centre for Reviews and Dissemination concludes that the lack of good evidence about the effectiveness of preschool vision screening justifies the withdrawal of the programme. The authors are concerned about the ethical correctness of inviting very young children to an implicitly beneficial examination when there is little to justify the intervention. The following article discusses the issues associated with vision screening of children aged three and four years old.

Sarah Snowdon MS (Oxon), MPhil, RGN, is a Research Officer at the Health Services Research Unit, University of Oxford and Sarah Stewart-Brown FRCP, FPHM, PhD, is the Director of the Health Services Research Unit, Department of Public Health and Primary Care, University of Oxford.

The screening of three- and four-year-old children was introduced as part of the child health surveillance programme during the late 1960s. By the 1980s, a variety of screening measures were in use, mainly of the standard letter or geometrical shape variety. These measure visual acuity or the limit of spacial discrimination and for children these are adapted appropriately. Several defects in visual acuity may be observed in children:
- Amblyopia is the reduction in visual acuity not explained by other organic defects
- Refractive errors produce a blurred image on the retina either through hypermetropia (long sight) or myopia (short sight)
- Squints in which the two eyes are aligned differently.

BACKGROUND

In the past, vision screening of preschool children has incorporated a number of tests undertaken at various ages. In some areas, orthoptists have either invited all children or those known to be at risk to attend for vision screening or have accepted referrals from GPs, clinical medical officers and health visitors. In other areas, these same professionals undertake vision screening themselves. In 1989 a UK national working party investigating the effectiveness of these programmes, recommended that the evidence to support screening at any preschool age was questionable.

QUESTIONS POSED BY THE REVIEW

This review attempted to identify the natural history, prevalence, uptake and effects of screening for the three conditions targeted by visual screening tests, that is, amblyopia, refractive error and the types of squint which are only detectable on testing. The review also attempted to gauge the degree of disability caused by these disorders. A combination of electronic and hand searching was used to locate cohort, placebo, comparison, experimental and epidemiological studies published in all languages since 1966.

RESULTS

Prevalence of visual disorders

Despite the paucity of material relating to the prevalence of visual defects, the material that was available indicated beyond doubt that visual defects are sufficiently common to justify screening programmes.

Disability caused by vision defects

Although experimental studies suggest that people with good vision in only one eye might be expected to be disabled in a number of ways, this was not borne out in the one study of the performance with people with amblyopia. Only one strong and consistent relationship emerges from studies of visual defects and reading, that children with myopia perform better in reading tests than their peers. The authors concluded that the quality of the literature on visual defects and disability is insufficient to offer advice to parents about the impact of untreated visual defects in their children.

RESULTS OF THE REVIEW

Uptake, detection and referral for preschool screening

The authors conclude that preschool vision screening programmes can be provided in the UK with acceptable uptake and referral rates. One study concluded that orthoptists were more effective in identifying children with some visual defects than health visitors or GPs and that hospital referrals may be reduced as a result. The only prospective controlled trial of
screening identified found that detecting children with amblyopia in their preschool years did not reduce the prevalence of this condition in seven-year-olds. No studies were found that enabled the benefit of identifying refractive errors in preschool children to be assessed.

**Treatment for defective vision in preschool children**

There were no trials of treatment for amblyopia or squint which included a control group of children who received no treatment. Given the lack of evidence on the natural history of these conditions, other types of study did not prove that treatment works. Studies of compliance with treatment suggest that orthoptic treatment may cause problems for children and their families. The immediate effect of spectacle correction of refractive errors on visual acuity is sufficiently well established for a trial of treatment to be superfluous. Questions remain, however, about the significance of reduced visual acuity in preschool children.

**The effectiveness of screening programmes**

The review found no randomised controlled trials (RCTs) of screening programmes for three to four year olds.

One prospective controlled trial compared visual outcomes of seven year olds who were screened at three by orthoptists, GPs or health visitors. This study suggests that while orthoptic screening led to earlier treatment it did not reduce the prevalence of amblyopia in seven year olds (Clarke 1997).

**The costs of screening**

No studies were designed with the primary aim of evaluating the costs of screening.

**CONCLUSION**

The authors conclude that, in the absence of good evidence that the visual defects which preschool screening aims to identify are disabling and that the available treatments do more good than harm, health authorities should stop purchasing preschool vision screening programmes. An invitation for screening carries with it the assumption that children will benefit from being identified. At present, there is insufficient evidence for clinicians to explain to parents the benefits of preschool vision screening or the treatment of visual defects detected in this way, to enable them to make informed choices.

The evidence that side effects of screening programmes can outweigh the advantages is mounting. Children who are prescribed spectacles often do not wear them, suggesting that the benefits of correction are not as important as social acceptability.

The authors recommend that in the absence of reliable evidence and sound ethical arguments in its favour, preschool vision screening should be discontinued.

**REFERENCES**


