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REFRACTIVE ERRORS: MAGNITUDE OF THE NEED

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The results of blindness surveys are usually presented as data on best corrected visual acuity. This is true whether we look at population-based surveys, surveys of outpatients, examinations of children in institutions, or figures from private practice or blindness registrations. We seem to assume that everybody wears their most appropriate spectacles all the time, and so the only visual impairment we are really concerned about is that which remains after the provision of best correction!

Dr Cathy McCarty and her team in the Centre for Eye Research Australia have examined a population-based sample of some 5,000 people in Victoria; the Visual Impairment Project.1 I was astounded to review this data on the causes of visual impairment

- The fourth most important cause of blindness by the WHO definition (<3/60) was refractive error; it caused 8% of blindness after age-related macular degeneration (AMD) 46%, glaucoma 17% and cataract 14%. For these people the appropriate correction would have improved their vision to be better than this category.
- The legal definition of blindness in Australia is vision <6/60. Twenty three per cent of those who functionally were legally blind had this level of visual disability purely because of undercorrected refractive error. This was the second leading cause just behind AMD that was responsible for 27% of blindness at this level.
- The WHO definition of low vision is vision of <6/18. Fully 33% of those with low vision in Australia were due to refractive error.

It is particularly important for us to recognise how people actually function day to day and what level of vision they use for these activities. We should therefore look at the presenting visual acuity when we try to assess the magnitude of visual disability in the community.

In developed countries, and in the urban areas in the developing world as well, the ability to drive a car has almost become the defining criterion for independent living. In Australia, vision of 6/12 or better is required to hold a driver's licence. In over half

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(53%) of those with less than driving vision, undercorrected refractive error was the cause.

These findings are particularly noteworthy in a country such as Australia. Australia has a universal health care system and there is access to free eye care for all residents as well as the subsidised provision of glasses to the poor. Undercorrected refractive error was found more commonly in the elderly; interestingly, in those with underlying ocular disease, and in those who had not had a recent examination. People with higher education were less likely to have undercorrected refractive error. Gender, ethnic background and employment were not found to influence this.

It is astonishing that we could alleviate a quarter of the blindness and half the low vision just by providing an appropriate pair of glasses! To achieve this, we do not need a breakthrough in molecular biology, the development of new laser surgical techniques or other high powered research breakthroughs. What we need to do is make sure we have regular screening of those groups of people at risk, particularly school children and the elderly. We need health promotion activities to encourage people to have eyes checked if they notice a change or decrease in their vision, and we need the provision of accessible and affordable spectacles.

Jill Keeffe and her team in our Centre have developed simple screening tools to assess vision and visual function under a variety of circumstances.[2] Using the pinhole test they can go some way in sorting out those who have undercorrected refractive error from those with other causes of vision loss. Having developed the visual testing kit for WHO, they have developed material for use in home testing and also for the assessment of the elderly.

Our data from Melbourne relate to distance correction but the problem with near vision is probably even more marked, especially in the elderly. The widespread distribution of ready-made reading glasses offers a very cheap and effective method to address this problem.

Undercorrected refractive error, particularly myopia, is especially a problem in school children. Poor vision and the inability to read material written on the blackboard can have a serious impact on a child's participation and learning in class and this can adversely affect a child's education, occupation and socio-economic status for life.

People who are blind or visually impaired not only lose their vision but they also suffer a number of physical and social consequences. In the Beaver Dam Study in Wisconsin, USA, Ron and Barbara Klein found that these people were twice as likely to fall and four times as likely to suffer a fractured hip.[3] In Salisbury, Maryland, USA, Sheila West and colleagues found that these groups were twice as likely to report difficulties with routine activities of daily living, social functioning, or participation in religious activities.[4] In the Blue Mountains of Australia, Paul Mitchell showed there was a 12% increase in the use of community support services for every line of vision lost.[5] The Beaver Dam Study showed that those with even moderate vision loss (20/40 or worse) had a 57% increased risk of dying compared to those without vision loss. All these statistics come from developed countries! In developing areas of the world, from both East and West Africa for example, we know from a number of studies that people who are blind may have a three to four-fold increase in mortality rate, compared to

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sighted control villagers. There are no data to separate the effect of visual impairment or blindness due to refractive error from other causes, and it can be assumed that the impact of uncorrected refractive error is comparable.

Clearly, there is a major need to assess vision and to improve it by whatever means are needed. It is remarkable that such a large proportion of vision loss can be rectified with the simple provision of an appropriate pair of spectacles.

References

1 Weih LM, VanNewkirk MR, McCarty CA, Taylor HR. Age-specific causes of bilateral visual impairment. Arch Ophthalmol 2000; 118: 264–9

2 Keeffe JE, Lovie-Kitchin JE, Maclean H, Taylor HR. A simplified screening test for identifying people with low vision in developing countries. Bull WHO 1996; 74: 525–3

3 Klein BEK, Klein R, et al. Performance-based and self-assessed measures of visual function as related to history of falls, hip fractures, and measured gait time. The Beaver Dam Eye Study. Ophthalmology 1998; 105 (1): 160–4

4 West S K, Munoz B, Rubin G S, et al. Function and visual impairment in a population – based study of older adults. The SEE Project. Invest Ophthalmol Vis Sci 1997; 38: 72–82

5 Wang JJ, Mitchell P, et al. Impact of visual impairment on use of community support services by elderly persons: The Blue Mountains Study. Invest Ophthalmol Vis Sci 1999: 40: 12–19 p

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