5.3 Refractive error

5.3.1 Age or ageing and refractive error

Papers published from 1997 to 2006 and included in this review show that myopia increases with ageing in people under the age of 30 and over the age of 70 (Group 1). Patterns of myopia development with ageing are very dependent on location (eg in Nepal almost none; in Singapore up to 90%; see Chapter 6).

Hyperopia also appears to increase with ageing until age 70. After this age, it is unclear whether the condition stabilises and then further increases with extreme old age, or whether there is a shift to myopia between 70 and 85 (Group 2). It is also not clear whether age affects the incidence of astigmatism or merely changes the type of astigmatism present (Group 5). Another form of refractive error is presbyopia, which is, by definition, caused by ageing. Hyperopia may predispose individuals to early development of presbyopia (Group 2).

5.3.2 Diabetes and refractive error

Papers published from 1997 to 2006 and included in this review show that diabetes can cause transient hyperopia. This effect is corrected when hyperglycaemia is corrected (Group 2). Diabetes does not appear to be a risk factor for myopia (Group 4). No relevant studies were found in the search period for an association between diabetes and astigmatism or presbyopia.

5.3.3 Heredity and refractive error

Papers published from 1997 to 2006 and included in this review show that high myopia may be linked to genetic factors, but more research is needed. There may also be a genetic predisposition for astigmatism (Group 2). No relevant studies were found in the search period for heredity and hyperopia or presbyopia.

See Chapter 6 for further information on the relationship between heredity and refractive errors.

5.3.4 Computer or TV use

Papers published from 1997 to 2006 and included in this review found that extended use of visual display units may cause a tendency toward hyperopia (Group 2). There does not appear to be an association between computer and television use and myopia (Group 4). No relevant studies were found in the search period for these risk factors and astigmatism or presbyopia.
5.3.5 Reading or near-vision work and refractive error

Due to conflicting results, it is not clear whether myopia is associated with reading or other near vision work (Group 5). No relevant studies were found in the search period for these risk factors and hyperopia, astigmatism or presbyopia.

5.3.6 Ocular disease and refractive error

Papers published from 1997 to 2006 and included in this review found that cataract and glaucoma may increase the risk of myopia. Untreated retinopathy of prematurity can also lead to high incidence of myopia in adults (Group 2). Grave’s ophthalmopathy may be associated with greater with-the-rule (horizontal) astigmatism. However, given the low prevalence of Grave’s ophthalmopathy, it is unlikely to be a significant risk factor for astigmatism in the general population (Group 2). Glaucoma appeared to be associated with a decrease in hyperopia (Group 6). No relevant studies were found in the search period for ocular disease or presbyopia.

5.3.7 Trauma and refractive error

Papers published from 1997 to 2006 and included in this review show that, although rare, a wound can lead to secondary problems such as lenticular astigmatism. No papers were found in the search period for trauma and myopia, hyperopia or presbyopia.

5.3.8 Other risk factors and refractive error

No relevant studies were found in the search period for an association between refractive error and alcohol consumption, eye infections, UV damage, antidepressants, antihistamines or warm climate (Group 7).

See Chapter 6 for further information about the effect of light on development of myopia.

5.3.9 Diet and refractive error

Papers published from 1997 to 2006 and included in this review found that the link between a high glycaemic diet and myopia remains a theory, but would be an interesting area for future research.

See further information in Chapter 6 about the relationship between myopia and diet.

No relevant studies were found in the search period for an association between diet and hyperopia, astigmatism or presbyopia (Group 7).

5.3.10 Fatty acids and refractive error

Papers published from 1997 to 2006 and included in this review found no relevant studies for an association between fatty acids and myopia, hyperopia, astigmatism or presbyopia (Group 7).
5.3.11 Obesity and refractive error

Papers published from 1997 to 2006 and included in this review found that obesity may be a risk factor for hyperopia, although more research is required in this area.

No relevant studies were found in the search period for an association between obesity and myopia, astigmatism or presbyopia (Group 7).