By looking for early signs of cataracts when conducting holistic patient assessments, nurses can help affected patients manage any loss of vision until surgery is appropriate.

Nurses’ role in early detection of cataracts

In this article...
- Prevalence rates of cataract
- Predisposing factors and early warning signs and symptoms
- Cataract symptoms and differential diagnoses


Abstract Cataracts are a common problem but can have a significant negative impact on an person’s functional abilities and emotional wellbeing. This article provides nurses with an insight into how age-related cataracts develop and clarifies which symptoms to look out for when conducting holistic patient assessments. Many symptoms go unnoticed for years but early detection could help patients learn to manage gradual loss of vision, thereby maintaining a good quality of life for as long as possible.

Cataracts have a significant impact on NHS resources and patients’ independence and quality of life. Despite their high incidence, however, their impact is rarely considered outside ophthalmology.

Minassian et al (2000) stated that in the UK adult population there were 225,000 new cases of visually impairing cataracts per year. The NHS performed 345,038 procedures to treat cataracts in 2012-13 (Health and Social Care Information Centre, 2014), with a further 20,800 performed in the independent sector (HSCIC, 2012); the number of procedures rose the following year to 371,240 (HSCIC, 2015). Worldwide it is estimated that 18 million people are “cataract blind”, representing half of all cases of blindness (Lansingh, 2011). This article focuses on age-related cataracts and nurses’ role in their early detection.

Impact of cataracts
There are several cataract types (Table 1); with some, patients may have “normal” vision in certain light conditions despite having cataracts. However, visual impairment due to cataracts can reduce functional status and wellbeing to a degree comparable to those with a major medical condition (Chia et al, 2004). The decline in visual acuity is insidious and patients may not notice for some time; although it is likely to have been deteriorating for several years, they often report a sudden loss in visual acuity.

Diminishing visual function can cause a range of problems. Patients may find it difficult to:
- Recognise faces;
- Watch television;
- Read;
- Drive.

As a result, leisure, employment, activities of daily living, socialisation and safety can be negatively affected. A diminishing appreciation of colours may also hinder contrast and affect employment.

Pathophysiology of cataracts
The lens is an asymmetric spheroid located behind the iris in the anterior segment of the eye that possesses no nerves, blood vessels or connective tissue. It has three parts:
- An elastic capsule, made up of collagen fibrils that envelop the whole lens;
- Lens epithelium, which is confined to the anterior surface;
- Lens fibres, which make up the main mass of the lens.

Over time, some lens fibres lose their nuclei and start to produce crystallins; these water-soluble proteins are thought to increase the refractive index and transparency of the lens (Yanoff and Duker, 2008). These crystallins concentrate over time in the central portion of the lens, increasing its density, making it less pliable.

Prevalence rates of cataract
- Half of all cases of blindness in the world are attributable to cataracts
- Women are much more likely than men to develop cataracts
- Cataracts can reduce a person’s ability to perform everyday tasks and negatively affect their quality of life
- As vision deteriorates gradually, many people have cataracts for years before they notice any loss of vision
- Nurses in all settings can look for early warning signs and symptoms of cataracts

Patients should be referred to an ophthalmic unit in cases of suspected cataracts.
Patients’ safety can be compromised if they cannot see to avoid potential hazards, even in familiar environments. Davey et al (2011) noted that patients with cataracts who have had a procedure experienced fewer falls at home (18% compared with 25% of those who have not had a procedure), and fewer bone fractures (3% compared with 12%); this clearly shows that rehabilitation of vision from cataract surgery has wider benefits for patients.

Some cataracts are associated with visual glare at dusk or dawn; this can make driving difficult or dangerous, putting patients at risk of committing an offence if they are unable to comply with the eyesight requirements of the Road Traffic Act 1988. They may lose mobility and independence by giving up driving.

In the UK, the only test of visual ability to be able to drive is the registration mark or number plate test – drivers must be able to read a registration plate with letters and figures measuring 79mm high and 57mm wide at a distance of 20.5m. This forms part of the practical driving test but a driver arrested on suspicion of driving without the required visual acuity may be required to take it – refusal to do so is an offence. Drivers with cataracts may not meet this legal standard, and any practitioner who suspects that a patient cannot do so should advise them to have an ophthalmic assessment of their visual fitness to drive via an optometrist or, if in hospital, the hospital eye service.

**Predisposing factors**

Although age is a primary cause, aetiological epidemiological studies have identified a number of risk factors for cataracts.

**Age**

In the UK the average age of patients undergoing cataract procedures is 74 years (Health and Social Care Information Centre, 2015). Hammond et al (2000) estimated the heritability of age-related cataracts to be 48-59%.

**Gender**

The prevalence of cataracts is higher in women, with a female: male ratio of 1.22:1 (Royal College of Ophthalmology, 2010).

**Diabetes**

Diabetes is linked to a fivefold higher prevalence of cataracts (Obrosova et al, 2010). The risk of cataracts increases with the length of time patients have had diabetes and the severity of hyperglycaemia (Naghaban and Chern, 2002). Transient loss or blurring of vision in patients with diabetes could result from poor glycaemic control. Those with bilateral blurring of vision not known to have diabetes should have serum glucose levels checked.

**Sunlight**

A meta-analysis by Zigman (1993) found a link between excessive exposure to sunlight and cataracts, concluding that UVB radiation is more likely to cause cataracts. Several studies have confirmed this, including Roberts (2011), who suggested people over the age of 50 should wear UV protective eye-wear. The eyes should be protected when outdoors, especially on sunny days, by peaked or brimmed hats and/or sunglasses that meet British and European standard code BS EN ISO 12312-1:2013. This standard has a 0-7 category range, with 0 being no or insufficient protection and 7 being full protection. Lens tints are on a 1-4 range; 4 is the darkest and is not suitable for driving.

**Prolonged steroid use**

The prolonged use of topical, inhaled and systemic steroids (usually in patients with long-term conditions such as rheumatoid arthritis and chronic obstructive pulmonary disease) is associated with axial cataracts, which tend to develop more quickly and more densely than other types, with colour, contrast and acuity failing more rapidly. Jobling and Augustyen (2002) suggested steroids do not directly act on the lens but affect the balance of ocular cytokines and growth factors, but the mechanisms are not fully understood.

Nurses should be mindful of the risk of corticosteroid-induced cataracts when caring for patients with conditions requiring long-term steroid treatment (Wang et al, 2013), such as long-standing respiratory problems and inflammatory disorders like systemic lupus erythematosus.

**Smoking, alcohol and obesity**

There is conflicting evidence on whether there is an absolute link between cataract formation and smoking, alcohol consumption or high body mass index. Cumming and Mitchell (1997) demonstrated an increased link in the development of cataracts in people who both smoke and drink alcohol. Kelly et al (2005) found a fourfold increase in the development of nuclear cataracts in smokers, but no link between passive smoking and cataract formation.

Cumming and Mitchell (1997) reported that drinking alcohol in itself was not thought to cause cataracts; this was supported by Klein et al (2003). However, Hiratsuka and Li (2001) noted that long-term habitual alcohol consumption, particularly of spirits and wine, could be associated with cortical cataract formation. People with a high BMI are at increased risk of developing posterior subcapsular, cortical and nuclear cataracts (Hillier et al, 1998).

The other conditions associated with smoking, alcohol and obesity may mean nurses are less likely to recognise if patients have poor visual acuity. Asking patients whether they have experienced any loss of vision while conducting the nurse assessment could help to identify those with cataracts at an earlier stage.

**Diagnosis**

Symptoms of cataracts develop gradually and painlessly, but can vary depending on the location, size and whether the patient has unilateral or bilateral cataracts (National Institute for Health and Care Excellence, 2010). Table 2 lists the main symptoms and diagnoses.

**Assessing visual function**

Assessment of visual function and confirmation of cataracts to the exclusion of a differential diagnosis must be performed by a qualified professional. However, recognising patients with a visual impairment is the first step to diagnosis; all

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**TABLE 1. COMMON TYPES OF CATARACTS**

<table>
<thead>
<tr>
<th>Cataract type</th>
<th>Main symptoms</th>
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<tbody>
<tr>
<td>Nuclear sclerotic</td>
<td>Near vision can improve to begin with, patients can manage without reading glasses for a while. Distance vision worsens.</td>
</tr>
<tr>
<td>Cataract</td>
<td></td>
</tr>
<tr>
<td>Cortical</td>
<td>Light is scattered quickly throughout the lens, causing blurring of vision. Associated with glare, loss of contrast and depth perception.</td>
</tr>
<tr>
<td>Posterior subcapsular</td>
<td>More common in the younger age range. Haloes and glare common during dusk, dawn or night-time, especially when driving.</td>
</tr>
<tr>
<td>Post capsular</td>
<td>Visual acuity is worse when the pupil is constricted, such as in daytime and when reading.</td>
</tr>
<tr>
<td>Axial</td>
<td>An opacity on the visual axis in the lens.</td>
</tr>
</tbody>
</table>

TABLE 2. DIFFERENTIAL DIAGNOSIS OF PAINLESS LOSS OF VISION

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Differential diagnosis</th>
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<tbody>
<tr>
<td>Difficulty reading</td>
<td>Uncorrected refractive error</td>
</tr>
<tr>
<td>Difficulty recognising faces</td>
<td>Some types of corneal disease, eg Fuchs' endothelial dystrophy</td>
</tr>
<tr>
<td>Difficulty watching television</td>
<td>Presbyopia</td>
</tr>
<tr>
<td>Difficulty seeing in bright light</td>
<td>Age-related macular degeneration</td>
</tr>
<tr>
<td>Reduction in colour intensity</td>
<td>Primary open-angle glaucoma</td>
</tr>
<tr>
<td>Gradual reduction in contrast</td>
<td>Chemicals or medication, eg methanol, chloroquine, hydroxychloroquine, isoniazid, thiazolidine, isoretinoin, tetracycline or ethambutol and statins</td>
</tr>
<tr>
<td>Frequent changes of spectacles (refractive change)</td>
<td>Pituitary tumour and papilloedema (particularly if chronic)</td>
</tr>
<tr>
<td>Double vision in one eye (monocular diplopia)</td>
<td>Chronic uveitis</td>
</tr>
<tr>
<td>Reduced need for reading glasses: cataract increases the converging power of the lens, making patients short-sighted</td>
<td>Diabetic retinopathy</td>
</tr>
<tr>
<td>Difficulty driving at night or in the day, due to glare</td>
<td>Diabetic maculopathy (type 2 diabetes may present with chronic visual loss from maculopathy)</td>
</tr>
<tr>
<td>Reduced need for distance spectacles</td>
<td>Long-sighted eyes may become focused in the distance as a result of myopia</td>
</tr>
</tbody>
</table>

nurses can contribute to this by considering visual acuity during holistic patient assessments.

Patients who have difficulty reading, or who avoid reading, should be asked about their ophthalmic history, including:
- Increasing frequency of changing lens prescription;
- Changing to large-print books;
- Loss of colour appreciation.

If visual assessment charts are unavailable, ask the patient to read a newspaper article. If the patient could previously read text of that size but now cannot their eyesight should be discussed further.

If visual impairment is suspected to be caused by cataracts, patients can be referred to a local ophthalmic unit for assessment; community optometrists can also refer. Domestic visits from community optometrists and ophthalmic services are available for patients in long-stay settings or who find it difficult to leave home.

Treatment

Treatment is by surgical extraction of the cataract and insertion of an artificial intraocular lens. This is done only when vision loss affects the patient’s ability to function normally. The Royal College of Ophthalmology (2010) recommends surgery is not performed if:
- Tolerable refractive correction provides vision meeting the patient’s needs;
- Surgery is not expected to improve visual function, and no other indication for lens removal exists;
- The patient cannot safely undergo surgery due to coexisting medical or ocular conditions;
- Appropriate post-operative care cannot be arranged;
- The patient or surrogate decision maker cannot give informed consent for non-emergency surgery;
- Indications for second-eye surgery are the same for the first eye (with consideration given to needs for binocular function).

Conclusion

Nurses in all settings can help identify patients experiencing loss of visual acuity and refer them to local ophthalmic services. This could increase the number of cataracts diagnosed at an early stage, allowing patients to be helped to access and develop skills to compensate for their reducing vision until surgery is appropriate.

REFERENCES


For more on this topic go online...

Patient support to reduce risk of diabetic retinopathy

Bit.ly/NT-CataractRole

Michelle Mello