Article Title: Cataract management and its impact on patients’ quality of life

Abstract

This article discusses the epidemiology of cataract, normal and altered physiology of the lens, causes and risk factors of the disorder. The aims of modern cataract surgery are outlined and the main surgical approaches are discussed. The effects of ‘cataract blindness’ on the patient’s quality of life are addressed with particular reference to the negative impact caused by the onset of depression. The role of the nurse in promoting quality of life is discussed with reference to the value of psychosocial theory in the care and health promotion of older patients with cataracts.

Key Words: cataract blindness, quality of life, depression, health promotion, cataract surgery, improved vision

Introduction

Cataract is a common and important cause of visual impairment throughout the world (RCO 2010). It is defined as opacity of the lens. It is estimated that there are about 18 million people who are bilaterally blind from cataract (Ecosse et al 2011). This represents almost half of all causes of world blindness. Cataract is the most common cause of treatable blindness (James et al 2007).

*Epidemiology*

WHO (2004) estimates that there are 180 million visually impaired people globally. About 50% of these cases are caused by cataracts (Chew et al 2012). People with bilateral cataracts experience difficulty with performing vision-specific daily activities. Between 40- 45 millions of these are without useful vision (Asbell et al 2005). They are unable to walk about without assistance. Globally the burden of blindness is increasing due to growth and ageing of the population. Since cataract is primarily an age- related disorder, the prevalence could double by 2020. By the age of 70, 9% of people have moderate or more severe visual loss, and this increases to 30% for people over 80 years of age (Watkinson, 2011). While the incidence of blindness due to cataract is relatively low in developed countries, it can be as high as 72% in the developing nations ( Jobling and Augusteyn 2002).

The structure of the lens

In this section an overview of the anatomy and physiology of the lens will be presented with reference to a cross-section view of the eye (see Figure 1).

 Figure 1: A cross-section view of the eye.



From [www.fightforsight.org.uk](http://www.fightforsight.org.uk) (Last accessed: February 2014.)

The lens is a transparent biconvex structure approximately 5 mm thick with a diameter of approximately 9 mm (Field and Tillotson, 2008). It is positioned directly behind the iris (see Figure 1).

Figure 2: The anatomical layers of the lens.



The lens has 3 main anatomical layers; these are the capsule, cortex and nucleus (see Figure 2). Behind the anterior capsule is the anterior epithelium which gives rise to new fibre layers, known as the cortex. As the lens fibres grow, the central fibres become compacted to form the nucleus (Riordan-Eva and Cunningham, 2011).

The lens is made up of crystallins. It is composed of about 65% water, 35% protein, glucose, mineral salts and vitamins common to other body tissues (Riordan-Eva and Cunningham, 2011). Potassium is more concentrated in the lens than in most tissues. There are no pain fibres, no blood vessels or nerves in the lens. Its function is to focus light onto the retina. The lens is flexible and its curvature is controlled by the oculo-motor nerve. Changing the curvature of the lens allows focus on objects at different distances, a process known as accommodation. The lens is encased in a capsule and suspended within the eye by suspensory fibres. The capsule also plays a key role in the alterations which occur in the shape of the lens during near and far vision. The entry of water and electrolytes are controlled by both the capsule and the sodium and potassium ATPase pumps situated in the anterior epithelium. The capsule is resistant to chemicals and toxins (Marsden 2006). The lens is avascular and its metabolic needs are met by the aqueous humour through the permeable lens capsule (Kanski and Bowling 2012). Glucose and vitamin C are essential nutrients. Gluthathione is a key ingredient in a healthy lens as this protects against oxidative stress (Kanski and Bowling, 2011). The lens refracts light rays entering the eye so that a clear image is focussed on the macula. The lens has a stronger dioptric power in the very young, and has a power of plus 15 dioptres (Kanski and Bowling 2011). However, in adulthood, the dioptric power diminishes to about plus 8, and in older people, it is about plus 3 dioptres.

When the transparency of the crystalline lens decreases sufficiently to disturb vision, a cataract exists (Pavan-Langston 2004). The aging lens loses its clarity. It increasingly absorbs more ultraviolet and visible light which denatures the lens proteins, thus causing lens discoloration (Kanski and Bowling 2011). Cataracts may be broadly classified as shown in Table 1.

Table 1: Classification of cataracts and possible risk factors

|  |  |
| --- | --- |
| Classification of cataracts | Possible risk factors |
| Congenital  | Genetic tendency, Rubella |
| Trauma | Blunt trauma, chemical burns |
| Metabolic | Diabetes mellitus  |
| Toxic | Medication side effects e.g. steroids |
| Secondary to ocular inflammation | Uveitis, scleritis |
| Complication cataract  | Following intra-ocular surgery e.g. vitrectomy, retinal detachment surgery |
| Age-related cataract  | Ageing process and general debilitation  |
| Nutritional cataract  | Vitamin A deficiency , malabsorption of food |

 Age-related cataract

With increasing age, the lens becomes cataractous. Figure 4 shows an age-related cataract.

Figure 4: Age-related cataract



Source: from University of West London Library 2014.

The aetiology of age-related changes in the lens is not fully understood and is likely to be multifactorial (Asbell et al 2005). Field and Tillotson (2009) give three classifications of age-related cataract (see Table 2).

Table 2 – Types of age-related cataracts

|  |  |
| --- | --- |
| Nuclear cataract  | New layers of fibres are added. The lens nucleus is compressed and becomes harder with associated yellowing of the lens. It is associated with index myopia. It seldom interferes significantly with vision. |
| Sub-capsular cataract | These cataracts are granular opacities occurring mainly in the central posterior cortex just under the posterior capsule. It is commonly associated with a complaint of glare, such as night driving. It tends to reduce near vision more than distance vision. |
| Cortical cataract  | Discrete opacities develop within the cortex of the lens. They do not cause visual symptoms unless they involve the visual axis of whole cortex, in which case the lens becomes white and mature. As it progresses, it causes astigmatic type changes in the vision and monocular diplopia. |

In health, the lens maintains its clarity by controlling its water and electrolytes balance through a selective semipermeable capsular membrane and an active sodium and potassium pumps in its anterior cells. These pumps are energised by adenosine triphosphate. The ageing process and formation of oxidative radicals play a key role in damaging these pumps (Kanski and Bowling 2011). The lens fibres become swollen with water. Faulty pumps will allow sodium and chloride to enter the lens cells. Calcium and sodium intake are increased while potassium ion is diminished in the cells. The antioxidant glutathione and vitamin C are absent in a cataractous lens. The biochemistry is thus finely regulated in a healthy lens. Three stages are noted in ageing cataract (Field et al 2009)

* Immature cataract – this is the early stage when water is entering the lens. The lens fibres become swollen and disorganised. Part of the lens are becoming opaque
* Mature cataract – the whole lens is opaque and swollen
* Hypermature cataract – the lens has become dehydrated due to water. The lens is opaque and has a wrinkled capsule. Alternatively, the lens cortex may become soft and milky so that the nucleus sinks to the bottom of the capsule. Lens matter may leak out

Signs and symptoms

Cataracts develop slowly over years causing a gradual blurring of vision, which is not improved by wearing glasses. In some people vision can rapidly deteriorate. Developing cataract can cause glare, difficulty with night driving and multiple images in one eye which can severely affect the quality of vision (Williamson and Seewoodhary 2013). Some patients complain of spots in their vision, seeing haloes around bright lights, and not being able to see well in a brightly lit room or in sunshine (Kanski 2007). The colour vision may become washed out or faded. Some patients will experience reduced contrast sensitivity as the disease progresses (Kanski 2007). In the early stage of cataract, the effect on vision is quite minimal and wearing glasses might improve the patient’s vision, but in advanced cataract the patient may only perceive counting fingers or hand movements.

Cataract management

Cataract management is a multi-professional process involving ophthalmologists, optometrists, nurses and technicians (RC0 2012) and all patients are managed using the Cataract Care pathway. The aim of pre-assessment is to ensure that the patient is safe for surgery and able to manage post-operative care (Afanu, 2009). Assessment and investigations are carried out to ensure the patient’s eyes are otherwise healthy (RCO, 2012). These include:

* Patient’s general health
* Recording of visual acuity
* Thorough history taking
* Intraocular pressure measurement to ensure there is no glaucoma
* Vital signs recording
* Biometry and Keratometry (tests carried out to ensure the best corrective intra-ocular lens for surgery).

Electrodiagnostic tests may sometimes be useful in the assessment of retinal or visual dysfunction (RCO 2012). Tests for contrast sensitivity and glare are not of proven value according to Royal College of Ophthalmologists (RCO 2012). They also state that pre-operative medical testing (blood tests and ECGs) for patients having local anaesthesia have not been found to reduce the incidence of intraoperative or post-operative medical complications. The aims of cataract surgery are given in Table 3.

 Table 3: The aims of cataract surgery

|  |
| --- |
| * Restoration of vision to meet the patient’s needs
* Achievement of the desired refractive outcome
* Improvement in quality of life
* Ensuring patient safety and satisfaction
 |

(Royal College of Ophthalmologist Guidelines, 2010)

Cataract surgery

Cataract surgery is performed by the surgeon using a small incision on the cornea. Most cataract surgery is now performed under local anaesthetic. The popular surgical technique used is known as phacoemulsification. It involves using ultrasound to soften the hardened lens, which is then broken up and flushed out using fine instruments and special fluids. The surgeon splits the anterior capsule by a procedure known as capsulorrhexis. This involves making circular tear in the anterior capsule to allow phacoemulsification of the lens nucleus during cataract surgery (Kanski and Bowling 2011). An intra-ocular lens is placed in the capsular bag. The back membrane of the lens is left behind and this holds the intra-ocular lens in place. The whole procedure may take up to 10-15 minutes with modern cataract surgery (RCO 2010). It is suture less, and healing is fast. Figure 5 illustrates the phacoemulsification procedure.

Figure 5: Phacoemulsification procedure



Technological advances in cataract surgery

Cataract surgery is continuously evolving In future; the technology used could be even more sophisticated and précised to provide a much better visual outcome. Another technique which is gaining popularity among some surgeons is the use of Femtosecond laser. The laser produces incisions within the peripheral cornea which helps in correcting existing astigmatism. The results so far are promising (Nagy et al 2009). Laser cataract surgery has been designed to provide better visual outcomes and reduces surgical complications such as posterior capsular rupture. Table 4 lists the complications of surgery.

Table 4: Complications of cataract surgery

|  |
| --- |
| * Wound leakage
* Large corneal abrasion
* Increased intra-ocular pressure
* Uveitis
* Iris prolapse
* Posterior capsule rupture
* Dislocated lens
* Posterior capsule opacity
* Macular oedema
* Retinal detachment
 |

(Adapted from Riordan-Eva and Cunningham, 2011)

Impact on quality of life: the nurse’s role

Cataract visual impairment can have a major negative impact on the quality of older people’s lives (Williamson and Seewoodhary, 2013). Performing activities of daily living such as washing, dressing, cooking, reading, watching television, and even walking can become increasingly more difficult to undertake due to impaired vision. More significantly, tripping over due to an inability to detect ground-level hazards such as steps, kerbs and pavement cracks, and the subsequent risk of falls with associated injuries such as a hip fracture, can often result in an increased likelihood of eventually being placed in a nursing home. In addition, reduced participation in social activities can lead to a sense of isolation and loneliness and the possibility of the gradual onset of depression (Watkinson, 2011). The impact of such visual impairment clearly warrants surgical intervention to improve vision and restore the older person’s quality of life. The nurse’s role is therefore important in providing patients with help and support during the pre-assessment, and pre-and post-operative stages of cataract surgery. Some of the main responsibilities of this role include the provision of information through effective communication and interpersonal skills, and the promotion of health through exploration of health beliefs and attitudes. Specifically, the role of the nurse as a health educator can be enhanced by the effective utilisation of psychosocial theory.

Information-giving and effective communication

The experience of diminished sight has been documented as deeply unsettling, stressful and anxiety-provoking, resulting in loss of confidence, independence and freedom (Razavi, 2008). Thus the provision of accurate and relevant information to older patients needing to undergo surgery plays a pivotal role in promoting their independence, reducing anxiety, improving morale, and promoting their empowerment (Nursing and Midwifery Council (NMC), 2008). The nurse should have a real influence on the quality, effectiveness and efficiency of the older patient’s journey through cataract surgery (Watkinson and Awelewa, 2014).

Pre-assessment and pre-operative stages

Effective communication and information-giving during the pre-assessment and pre-operative stages are essential to help alleviate surgery-related anxiety, and promote the patient’s understanding and confidence as a basis for gaining their informed consent. Every patient has a right to receive information about their condition (NMC, 2008) thus patient education about ocular health is important (Royal College of Nursing (RCN), 2012). Both verbal and written information should be provided to the patient and their family or carer, to help increase their knowledge and understanding of cataract as an ocular disease, the proposed surgical procedure and possible risks, duration of stay in hospital, fasting instructions, time of arrival, likely time of discharge, and the importance of concordance with prescribed post-operative eye medications to restore ocular health effectively (Watkinson and Awelewa, 2014). Both patient and family members, or carer, must be shown how to instil eye drops correctly and safely, and how to clean the eyelids daily as part of good eye care. Moreover, the importance of hand washing before and after these procedures to prevent any cross-infection should also be emphasised (Watkinson and Seewoodhary, 2008). Encouraging the participation of family members will help to provide continuity of care following surgery, and this is particularly important where the older patient may suffer from physical disabilities such as arthritis.

Discharge planning

Discharge planning should start at the pre-assessment stage. All social aspects and the well-being of the patient should be documented and the appropriate needs identified. These may include:

* Booking transport for patients who meet the criteria
* Contacting social services if the need arises
* Arranging for other community care services, or arranging a district nurse or primary care physician
* Making arrangements for all eye drops to be dispensed by the pharmacy.

Dealing with such issues will facilitate a smooth discharge home and lead to a speedy recovery and patient satisfaction (Watkinson and Awelewa, 2014).

Post-operative stage

Post-operatively, the patient and family members, or carer, should be advised and shown how to observe the eyes daily for signs of excessive redness, swelling or stickiness indicating the presence of infection. Pain around the eye or sudden reduced vision necessitates contact with the eye unit for advice. These symptoms may signal the onset of ocular complications such as secondary glaucoma, uveitis or retinal detachment. A cartella shield must be provided to wear at night time while sleeping to prevent any ocular trauma. The length of time required, however, may vary from the first post-operative night only to up to 2-4 weeks. The cartella shield is re-washed and used again at bed time. To allay any fears the patient should also be reassured that adjustment to a new lens can take weeks or months for some people. Essentially, however, good unaided distance visual acuity is a realistic expectation following intra-ocular lens implantation. Nevertheless, for patients with cataracts in both eyes, the period between having the first and second operation can be difficult. Surgery creates a refractive imbalance and the need for correction of any short or long sight the patient may have. Normally, people are encouraged to wait until they have a second operation before getting new glasses. This avoids the need to buy new glasses which would only be useful in the short time between the operations. Some patients find they can manage with their old reading glasses, but this may not be possible for everyone. The gap between the two operations is usually around six weeks to three months. Although most patients can manage, some may experience difficulty with reading and performing ordinary tasks.

Health promotion

Health promotion advice includes the need for an annual visit to the optician, and if driving is essential, the patient should be verified safe to drive by an ophthalmologist and the Driver and Vehicle Licensing Agency (2014) guidelines should be followed. A self-help discussion is advisable to stress the benefits of maintaining a healthy diet, taking daily exercise, resuming participation in social activities, adhering to the recommended guidelines for daily alcohol intake, and highlighting the risks of smoking. It should also be acknowledged that patients with learning difficulties have increased health needs compared to the wider population (Royal College of Nursing (RCN), 2012). A number of studies have reported low uptake of health promotion or screening activities among people with learning difficulties, for example, assessment for hearing or visual impairments (Royal College of General Practitioners, 2012). Indeed, both sight and hearing problems are far more common in this group of people and, as such, support is needed to access regular examinations (RCN, 2013).

There is a higher risk of developing diabetes in this group of patients than in the wider population……weight problems……………diabetic retinopathy………..blood glucose control/b/p control/weight control…..reducing obesity……………

Communication difficulties

Any communication difficulties can be a potential barrier particularly during the process of pre-operative assessment. Such difficulties include the negative impact of being in a strange, noisy environment, anxieties, poor concentration, hearing loss, forgetfulness, or cognitive impairment such as mild dementia or depression; these will all impede the ability to communicate effectively. This means that communicating using jargon-free language, being prepared to repeat any information given, and allowing time for the patient to ask questions at any stage during conversation are all critically important. Written information should then be given to support the verbal input. In the case of patients from ethnic groups, language barriers may make communication problematic thus causing more anxiety and stress (Watkinson and Awelewa, 2014). To overcome some of these associated difficulties it will be necessary to provide written information in the appropriate language as required and according to Hospital Trust policy. Interpreting services must also be available for access both at the pre-operative and post-operative stages.

Older patients with learning difficulties

Communication with patients with learning difficulties should always be considered on an individual basis and appropriate support provided. The nurse should consider using simple everyday language, avoid abstract words or concepts, and use concrete terms wherever possible. In advance of engaging with patients it is helpful to think of easier ways of saying a word, for example, using ‘sad’ instead of ‘depressed’. When trying to communicate new information it is advisable to use no more than two information-carrying words in a sentence and provide an explanation to support this. The use of photographs, pictures and symbols can also be useful in helping the communication process (RCN, 2013).

Obtaining informed consent from older patients with learning difficulties raises the important ethical issue of making a decision in the best interests of patients who lack the capacity to do so (Mental Capacity Act, 2005) and must be managed judiciously. The aim must be to take particular care to give patients the time and support they need to maximise their ability to make decisions for themselves (General Medical Council (GMC), 2008). Again, reference to Hospital Trust policy for the management of this situation is required. Essentially, however, making arrangements to provide the necessary support might include using an advocate or interpreter, asking those close to the patient about the patient’s communication needs, or giving the patient a written or audio record of any discussions undertaken and any decisions made (GMC, 2008). Importantly, all the communication problems outlined above should be addressed at the pre-operative assessment stage.

Psychosocial theory and the health educator role

Knowledge and understanding of psychosocial theory and its utilisation in ophthalmic practice is invaluable in the nurse’s role as an effective health educator (Seewoodhary and Watkinson, 2011). This is particularly beneficial where older people need encouragement and the confidence to make an informed decision about the need for cataract surgery to improve their vision and restore quality of life. Clearly, modern day cataract surgery has proved to be very successful in restoring patients’ sight and quality of life. However, for some older people there is the misconception that sight is less important in old age and that the restrictive effect of vision loss should be accepted as part of growing old (Polack, 2008), and there may be a reluctance to seek medical advice and treatment.

Health beliefs and attitudes

Health beliefs and attitudes appear to have a significant influence on whether a person will consent to have treatment. This perspective is encompassed in the Health Belief Model (Becker, 1974), which may be used effectively here. This model suggests that whether or not a person is prepared to modify their beliefs and change their behaviour will be influenced by an evaluation of its feasibility, and the benefits weighed against the costs (cost-benefit analysis). This model was expanded to include Bandura’s (1977) concept of self-efficacy. The latter suggests that individuals must believe they are capable of carrying out change and that they must feel threatened by current health behaviour to become sufficiently motivated to change.

The nurse needs to explore with the patient their perceptions of the likelihood of cataract blindness and the perceived severity of it alongside the perceived efficacy of consenting to cataract surgery and complying with prescribed treatment to protect them from the implications of progressive loss of vision. These implications have previously been identified. More importantly, the persistent experience of such implications may lead to decreased motivation and the onset of depression. Encouraging self-belief for self-help is therefore important as patients must be encouraged to believe they are capable of changing their attitude and behaviour. This will subsequently incentivise them to make the required changes to undergo surgery and manage the situation to prevent further sight loss and promote their quality of life.

Depression and sight loss

Many older people with cataract vision experience depression which consequently affects their quality of life (Williamson and Seewoodhary, 2013). This implication should not be underestimated and reinforces the need for the nurse to be able to recognise the symptoms of depression. Core symptoms include persistent sadness, anhedonia (loss of pleasure) and fatigue. Associated symptoms include sleep and appetite disturbance, poor concentration, agitation, low self-confidence, suicidal thoughts and/or acts, and guilt (WHO, 2011). However, patients may not complain of depression and are more likely to refer to physical symptoms (WHO, 2011).

The use of psychosocial theory can again be effective in supporting patients to overcome feelings of depression. For example, the Health Action Model (Tones et al, 1990) identifies self-esteem as a key component in an individual’s motivation system. Utilising this model may help the nurse to understand that how individuals view themselves and how this will be a major influence on their readiness to take a health decision. It is about perceived control and has developed from Social Learning Theory (Rotter, 1954). The latter theory suggests that the ways in which individuals explain their own life events is a product of their childhood experiences. Perceived control is reflected in the concepts of ‘internal’ and ‘external’ locus of control. Individuals with an internal locus of control are willing to take responsibility for their health-related behaviour whereas those with an external locus of control are not, believing that their actions are limited by external factors such as powerful others, chance, fate and luck (Rotter, 1954). In the case of patients with cataracts, the inevitability of growing old and its consequences is the overriding limiting external factor.

Appropriate questioning is an important aspect of psychosocial care. The nurse should explore with the patient issues such as lack of motivation, lack of self-esteem, feelings of helplessness, anxieties, fears, inability to sleep and lack of appetite. Initially, two useful questions to ask in detecting depression are whether during the past month the patient has been bothered by feeling ’down’, depressed, or hopeless, and whether the patient has been having little interest or pleasure in doing things. If ‘yes’ responses are given, the nurse may provide further assessment using the Geriatric Assessment Scale and also assist with the Zung Self-Rating Depression Scale to support her judgment. These assessment tools should be promoted and used in the pre-assessment clinic. On-going monitoring of the course of the depression may subsequently require referral to appropriate healthcare professionals for help and treatment (NICE, 2010). Meanwhile, patients can be encouraged to become more hopeful about the benefits of a sighted quality of life through gaining more knowledge and understanding of what cataract surgery involves and how it can help to promote a longer term sight-related quality of life (Watkinson, 2011). Involvement in their own health situation, particularly for those who believe they are powerless to take any action, can encourage participation in decision-making for themselves. This will promote self- empowerment, thus increasing and maintaining motivation and adherence to planned treatment. This can be achieved through on-going informal dialogue and the use of open-ended questions (Mc Cabe and Timmins, 2013).

Conclusion

This article has provided an overview of age-related cataract with reference to normal and altered physiology of the lens, aetiology and risk factors. The main aims of cataract surgery were presented and the key surgical approaches discussed. Phacoemulsification can provide patients with hope of sight restoration. Clearly, cataract blindness does impact on quality of life and leads to depression in many patients. The nurse’s role in promoting quality of life was discussed as being significantly enhanced by using psychosocial theory and applying appropriate social cognitive models. Furthermore, nurses play an important role as health educators providing cataract patients with the relevant information, help and support required to regain sufficient control over the management of their sight loss. Consequently, this helps to maintain patients’ self-esteem and confidence, and re-establish quality of life in the longer term.

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