Care of patients undergoing intra-vitreal therapy


Summary
This article discusses the role of the ophthalmic nurse in the care of patients with wet age-related macular degeneration who are undergoing intra-vitreal therapy. It provides an overview of the condition, its classification, clinical features, aetiology, diagnosis and treatment, and explains the implications for future nursing practice. A proactive, evidence-based and holistic approach to nursing care is emphasised throughout the article.

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Age-related macular degeneration, eye disorders, nursing management, visual impairment

IN THE UK, 243,000 people have wet age-related macular degeneration (AMD) and 26,000 new cases are predicted each year (National Institute for Health and Clinical Excellence (NICE) 2008). It is important for nurses to exercise an increased awareness of the signs and symptoms of AMD to optimise its diagnosis and treatment. The aim is to prevent sight loss and promote longer-term, sight-related, quality of life.

There is a paucity of literature on the nurse’s role in the care of patients undergoing intra-vitreal therapy for AMD. The article aims to address this gap in knowledge and to promote good practice.

Age-related macular degeneration
AMD is the term applied to ageing changes that occur without any obvious cause in the macula (the central area of the retina), in people aged 50 years and above (Royal College of Ophthalmologists (RCO) 2009). Figure 1 shows a healthy retina with a normal macula, and blood vessels entering and leaving at the optic disc. Figure 2 shows degenerative changes occurring in the macula caused by choroidal neovascularisation. The macula is the most sensitive area of the retina and is 5.5-6mm in diameter. Vision is sharpest in the fovea (the central area), which is 0.25mm in diameter, is the narrowest part of the retina and contains only cone cells. Cone cells are responsible for daylight vision and for detecting colours (Marsden 2006). Overall, the macula provides for fine visual discrimination, optimal visual acuity and colour vision (Riordan-Eva and Whitcher 2008).

AMD is characterised by the growth of new blood vessels beneath the retina – a process known as choroidal neovascularisation (NICE 2008) (Figure 3). Box 1 lists the general signs and symptoms of AMD.

AMD is the leading cause of irreversible blindness in the developed world (Riordan-Eva and Whitcher 2008). Given the predicted increase in the ageing population as a result of demographic changes over the coming years, the incidence of AMD will continue to rise (NICE 2008).

AMD can be classified as either ‘dry’ (non-exudative or non-neovascular) or ‘wet’ (exudative or neovascular) (NICE 2008).

Dry AMD This is the most common form of AMD, usually with an insidious onset and rate of progression (Kanski 2007). Visual loss results from a progressive degenerative process, which leads to cell death and atrophy of the retinal pigment epithelium (Riordan-Eva and Whitcher 2008). The retinal pigment epithelium that nourishes the macula and removes its metabolic waste starts to age and become less efficient, allowing fatty, yellow, metabolic waste products, known as drusen, to accumulate in the retina (Kanski 2007).

The cells in the macula break down, causing central loss of vision but leaving peripheral vision unaffected (Kanski 2007). This form accounts for approximately 90% of cases of people with AMD and leads to a mild-to-moderate loss of sight.
(Kanski 2007). Over time, it can cause profound vision loss.

Currently, there is no treatment for dry AMD (Kanski 2007). However, nurses can still help patients through counselling, and referral to a low vision hospital clinic, the visually impaired team, social services and the rehabilitation team. Box 2 lists the specific signs and symptoms of this form of AMD.

**Wet AMD**

This type of AMD can lead to severe sight loss within months (Kanski 2007) and accounts for 80-90% of patients with AMD who are registered blind (Congdon et al 2004).

Progressive diffuse thickening of Bruch’s membrane (the inner layer of the choroid) reduces the ability of oxygen to diffuse through to the retinal pigment epithelium and photoreceptors, leading to local hypoxia. The latter gives rise to the release of growth factors and cytokines, which stimulate the growth of new choroidal blood vessels. These vessels leak serous fluid or blood into the macula, resulting in distortion and reduced clarity of central vision (Riordan-Eva and Whitcher 2008). Peripheral vision is, however, retained.

Choroidal neovascularisation can be subdivided into classic and occult forms according to its appearance on investigation by fluorescein angiography. The main difference between the two is that the classic form (leaking) is associated with a more abrupt and rapid progression of visual loss than the occult (quiescent) form (NICE 2008). Table 1 shows the specific symptoms of wet AMD.

**Aetiology**

The exact aetiology of AMD is unknown, but there are thought to be several risk factors, of which age seems to be the most strongly associated with the condition (Chopdar et al 2003). Other general and ocular risk factors are shown in Table 2.

The risk of developing AMD is 3.6 times greater for current and former smokers than for those who have never smoked (NICE 2008). Diet and nutrition may play an important part in AMD and in maintaining eye health. Boseley (2009) reported evidence from a randomised controlled trial, highlighting that the administration of an antioxidant supplement (containing vitamins C and E, zinc, lutein, and the carotenoids lutein and zeaxanthin) to a group of 400 people with AMD in one eye, and at risk of sight loss in the other eye, slowed the degeneration and sharpened vision. A systematic review and meta-analysis, however, showed that vitamins A, C and E, zinc, lutein, zeaxanthin, alpha and beta carotene, cryptoxanthin, and lycopene have little or no effect in the primary prevention of early AMD (Chong et al 2007).
Excessive sun exposure has been highlighted as a possible risk factor but, as yet, this is unsupported by published studies (Khan et al 2006).

**Diagnosis**

An Amsler grid (AMD.org 2010) is a useful tool for diagnosing AMD and enabling the patient to self-assess vision at home on a weekly basis. It also alerts the patient to any changes or worsening of the condition. Diagnosis is, however, based mainly on an ophthalmoscopic examination using stereoscopic slit-lamp biomicroscopy with fundal examination, optical coherence tomography and fluorescein dye angiography. Optical coherence tomography is an advanced, non-invasive procedure that produces high-resolution, cross-sectional imaging of the retinal layers (Riordan-Eva and Whitcher 2008).

**Posterior segment optical coherence tomography** enables a detailed analysis of the optic disc, retinal nerve fibre layer and macula. Microscopic changes in the macula can be imaged and measured (Riordan-Eva and Whitcher 2008).

**Treatment**

The treatment of wet AMD has been advanced by the emergence of new anti-vascular endothelial growth factor (VEGF) intra-vitreal drug therapies. VEGF is a potent inducer of vascular permeability (a disruption of the vascular barrier function in diseased tissues, thereby allowing seepage of fluids and macrophage migration) and stimulator of angiogenesis (growth of new blood vessels). It may also be pro-inflammatory. All these effects may contribute to the progression of wet AMD (NICE 2008).

The aim of this treatment is to prevent sight loss. At present anti-VEGF intra-vitreal drugs available are bevacizumab, ranibizumab and pegaptanib. These are all antibodies that target and neutralise VEGF. This article focuses on ranibizumab, as this is the drug used in the author’s unit.

Treatment is initiated with a loading phase of one 0.5mg injection of ranibizumab into the visual cavity, every month for three months. This is followed by a maintenance phase in which the patient’s visual acuity is monitored monthly. If the patient experiences a loss of more than five letters on a LogMAR chart, or one line on a Snellen chart, a further dose of ranibizumab should be administered. Patients are then followed up for two years to assess visual progress and monitor treatment outcomes.

**Role of the nurse**

The nurse should take a full patient history, documenting presenting ocular symptoms and medication regimen, other current medication, medical history, social history, allergies and any family history of eye problems. Other procedures performed include:

- Recording visual acuity using a LogMAR or Snellen chart.
- Measurement of intraocular pressure to check and monitor the intraocular pressure in patients with existing glaucoma. If the intraocular pressure is found to be elevated, appropriate treatment is administered.
- Checking for rapid afferent pupillary defect to exclude the possibility of damage to the optic nerve.
- Dilating the pupil with tropicamide 1% and phenylephrine 2.5% eye drops to ensure a good view of the retina and to observe for the pulsating of the central retinal artery.

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**Box 1**

**Signs and symptoms of age-related macular degeneration**

- Objects appear to change shape, size or colour.
- Objects may appear to move or disappear.
- Centrally blurred vision.
- Lines may appear distorted and/or wavy.
- Dark spots may appear in central vision.
- An area of blindness may block out several words at normal reading distance.
- Difficulty experienced seeing in bright sunlight.
- Glare.

(Kanski 2007)

**Box 2**

**Specific signs and symptoms of dry age-related macular degeneration**

- Presence of soft drusen (discrete lesions consisting of lipids and protein deposited under the retina).
- Areas of increased pigment or hyperpigmentation (in the outer retina or choroid).
- Areas of depigmentation or hypopigmentation of the retinal pigment epithelium.
- Deterioration of central vision (when the atrophy is bilateral and involves the macula of both eyes).
- Difficulty with reading, initially the smaller sizes of print and later larger print.

(Royal College of Ophthalmologists 2009)
Performing fluorescein dye angiography.

Optical coherence tomography performed by a specialist nurse or technician.

**Psychological support** Feelings of hopelessness, anxiety, depression and thoughts of suicide are often expressed by patients with AMD. It is common for patients to feel a deep sense of shock, anger or denial (Lewis and Southwell 2006). Patients with AMD are twice as likely to experience clinical depression and emotional distress compared with people with normal vision (Blyth 2006). Significant loss of vision has a substantial effect on quality of life and living independently, particularly for people who live alone.

Patients may experience Charles Bonnet syndrome, in which visual hallucinations are experienced, resulting in anxiety and profound distress. Reassuring patients that such experiences are purely a visual symptom, not a mental health problem, and that hallucinations seem to abate, usually after 18 months for 60% of people (Ricard 2009), can help relieve some of the distress. Suggestions for controlling the hallucinations include creating a brighter environment or a distraction, and looking directly at the images or making some form of eye movement (Ricard 2009).

The prospect of sight loss is daunting, and building a therapeutic relationship with the patient is imperative. An injection directly into the eye always provokes extreme anxiety, which persists throughout the pre and post-injection stages. Having insight into patients’ feelings and fears of blindness is integral to the ophthalmic nurse’s role, and counselling skills, active listening and positive responses are crucial to the delivery of quality care. Patients may be able to cope with their emotions better when the nurse spends time allaying apprehensions and fears.

A quiet environment is critical for breaking bad news to patients newly diagnosed with wet AMD. The nurse should allow patients to explore their feelings and thoughts as a basis for participation in their own care and future self empowerment. Placing quality at the heart of patient care and service delivery is essential (Catton and Bullock 2009).

Referring the patient to other support services such as the Macular Disease Society, AMD Alliance International, the Royal National Institute of Blind People, the trust’s rehabilitation team, social services, local hospital patient support groups and counselling services, (especially in the event of unsuccessful treatment), may help in meeting a wide range of needs.

**Preparation for intra-vitreal therapy** To ensure successful outcomes a multidisciplinary approach is needed. The ophthalmic nurse assists the medical

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**TABLE 1**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>Clouding, flickering, flashing lights, hallucinatory forms</td>
</tr>
<tr>
<td>Metamorphopsia</td>
<td>A distortion of central vision – straight lines appearing bent</td>
</tr>
<tr>
<td>Scotoma</td>
<td>A blind spot in the visual field</td>
</tr>
<tr>
<td>Decreased visual acuity</td>
<td>A decrease in the ability to distinguish between letters such as ‘o’ and ‘c’</td>
</tr>
<tr>
<td>Decreased contrast sensitivity</td>
<td>A decrease in the ability to distinguish between, for example, individual steps when going up and down stairs</td>
</tr>
<tr>
<td>Decreased colour vision</td>
<td>A decrease in the ability to see colours</td>
</tr>
</tbody>
</table>

(Ricard 2002)

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**TABLE 2**

<table>
<thead>
<tr>
<th>General factors</th>
<th>Ocular factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>Presence of soft drusen (small, yellow lipid deposits arising from Bruch’s membrane in the retina)</td>
</tr>
<tr>
<td>Elevated cholesterol</td>
<td>Macular pigmentary change</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Choroidal neovascularisation in the other eye</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td></td>
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<tr>
<td>Race – Caucasians are more likely to have choroidal neovascularisation</td>
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<tr>
<td>Family history</td>
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(Age-Related Eye Disease Study Research Group 2000, Chopdar et al 2003)

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**NURSING STANDARD**

- NURSING STANDARD
hospital interpreter, will be asked to attend and assist with the information-giving process. **Management of the procedure** The ophthalmic nurse stays with the patient throughout the procedure to gain his or her confidence, enhance safety and maintain comfort and full co-operation. The nurse holds the patient’s hand during the procedure to provide reassurance if needed by the patient. Patient dignity and communication preferences are always respected and prioritised. Promoting partnership with the patient is central to the philosophy of providing high-quality patient-centred care and to maintaining a ‘culture of excellence’ (Department of Health 2008).

Following the injection, the patient is monitored for 15 minutes for any adverse reactions, which are not commonly experienced. Occasionally, a patient may feel faint, and – very rarely, in the worst case scenario – anaphylactic shock may occur. **Ocular preparation** Tropicamide 1% and phenylephrine 2.5% eye drops are instilled into the affected eye approximately 15 minutes before the procedure, to maximise pupillary dilation. Best practice also consists of instilling copious tetracaine hydrochloride 1% (a topical anaesthetic) eye drops over five to ten minutes to minimise pain (RCO 2009). Studholme (2008) suggested that most patients remember the experience of pain when the needle is inserted. Maximum topical anaesthesia is therefore vital to optimise comfort during the procedure.

The appropriate eye is marked to ensure the correct patient receives treatment to the correct site. Informed consent is obtained before every intra-vitreal anti-VEGF therapy procedure, once a firm diagnosis has been established. It is imperative that patients are given time to comprehend the information on treatment modalities and the prognosis for maintenance of their sight. The patient’s identity is confirmed using a checklist against which the individual’s details are verified verbally, as per local policy. **Health promotion** Providing clear and accurate information to ophthalmic patients is an intrinsic part of the consultation process. Diagnosis and treatment are insufficient as a strategy if the patient is not fully involved in, and informed about, all aspects of care.

There is a theoretical risk of infection following the intra-vitreal injection. Patients are prescribed chloramphenicol 0.5% eye drops both before and after the treatment. It is imperative that patients wash their hands before and after this treatment. Demonstration of eye drop instillation followed by supervised practice will help all new patients to maintain concordance. It is also imperative for patients to continue to instil any prescribed glaucoma eye drops. Prescribed eye drops must be kept refrigerated. If the patient is going out for the day, he or she must take the drops with him or her.

Other advice that the patient should be offered includes:

- The eye may be red and feel gritty for approximately 24 hours post-surgery. Patients should take appropriate analgesia (such as paracetamol) to relieve the symptoms.
- It takes approximately three to four hours before the pupil size returns to normal. Focusing may be difficult during this time, and it is vital that patients are fully informed of this, especially if the non-procedural eye is non-functional.
- Patients are advised to refrain from rubbing the treated eye because of the risk of sustaining a corneal abrasion following topical anaesthesia.
- Patients may notice small black or transparent dots in their visual field. These represent little drops of ranibizumab, or small air bubbles, in the vitreous humour. Generally, symptoms disappear within one or two days, and the brain adjusts to the situation.
- Patients should wear dark glasses in sunny weather to avoid direct ultra violet rays. An Amsler grid should be provided to self-monitor any deviation in vision.
- Appropriate telephone numbers should be given to patients to use in the event of any deviation from the normal. A 24-hour emergency service is operational in the author’s trust.
- If patients experience excruciating pain, sudden loss of vision or any further deterioration, they must attend the eye emergency department immediately, without an appointment. This is particularly important if endophthalmitis (a potentially serious infection and inflammation of the internal coats of the eye) is suspected (RCO 2009).
- A quiet day following the procedure is advisable.
- Avoid swimming and splashing water into the eye for five days to prevent any infection.
- Patients are advised to attend all follow-up appointments and to complete the course of treatment.

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Implications for future practice

Wet AMD negatively affects patients’ quality of life. Nurses are in a key position to recognise the symptoms and make immediate referrals for specialist care. This aspect of care is most important and great vigilance is crucial.

Clinical direction and leadership are essential to the professional role of the ophthalmic nurse. Critical reflection will help to influence and shape the future direction of intra-vitreal AMD therapy services. Patients need to feel assured of a high standard of evidence-based nursing care, and fostering this approach is essential in the clinical setting (Cleary-Holdforth and Leufer 2008). Without a clear vision, it will be impossible to sustain the fast track intra-vitreal therapy service envisaged for all units in the future.

Demographic changes and the predicted increase over the coming years in the number of older people with AMD needing to access services will inevitably affect clinic capacity. Proactive strategic planning is required to maximise effective management of AMD clinics. Ongoing audit will be necessary to ensure the maintenance of standards of care and to monitor patient satisfaction. It is also important to instruct other healthcare professionals about AMD and the need for fast tracking patients through the referral pathway – that is, within 24-48 hours.

Conclusion

The ophthalmic nurse’s role in the care of patients with wet AMD undergoing intra-vitreal therapy is crucial and continues to evolve. Key elements in the provision of this service are the use of effective counselling skills, good communication and a team approach to help patients to adjust to visual loss and its effect on quality of life. Updating clinical knowledge and skills to deliver effective health education and demonstrating vision and dynamic leadership are also important. The aim is to promote the patient’s independence in self-management, leading to the maintenance of vision and longer-term, sight-related, quality of life.

The primary challenge is to take a collaborative approach to raise public awareness about the nature of AMD. This will help prompt referral and diagnosis and help initiate immediate treatment, as required. Demonstrating compassion, empathy and insight into patient fears about going blind is an equally significant future challenge.

References


