

How to care for a patient's eyes in critical care settings

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Eye care is one of many important aspects of the nursing management of critically ill patients. All patients in acute care settings who have absent or compromised defence mechanisms are at risk of eye problems and ocular surface disease, due to corneal exposure has been reported to occur in a very high number of critically ill patients. Incomplete eyelid closure and lack of lubrication are the main mechanisms underlying the development of corneal damage. Unconscious, sedated and/or paralysed patients or those with a reduced Glasgow Coma score are dependent on their carers to maintain their ocular surface and prevent complications such as corneal abrasion, infection, ulceration and eventually, perforations and blindness. Meticulous nursing care is required to prevent ophthalmic complications and regular, high quality eye care for this group of patients should be part of routine nursing practice. This article aims to assist nurses in critical care areas to look after the eyes of their patients in order that any issues are detected early and that ophthalmic issues are addressed routinely so that on discharge from the critical care area, visual compromise is not added to existing issues.

Preparation and equipment

Eye health assessment should be part of routine patient assessment and should be performed on admission and at every patient handover. Initial assessment should involve relatives to identify pre admission eye problems and treatment. Ophthalmology review may be required at this time and should be considered when any change to the condition of the eyes is noted.

Procedure

Initial assessment and at each handover

- Assess eyelid closure
- Assess eye using a bright light (pen torch or ophthalmoscope) for signs and symptoms of eye infection or disease such as
 - Redness
 - Discharge
 - Conjunctival swelling
 - Haziness or cloudiness of cornea

- Patches or spots on cornea

Routine eye care

- Regular eyelid cleaning to remove debris, secretions and any dried ointment or other medications should be carried out. While the eye is not a sterile area, normal saline or sterile water and a dressing pack are often used for this procedure. It is the lids and surrounding tissue that are cleaned, rather than the eye itself.
- For all patients who are not able to maintain lid closure, 2 hourly eye care must be undertaken to prevent ocular surface defects and reduce the risk of infection (Azfar et al 2013, Demirel et al 2014). This entails:
 - Cleaning of the eye with saline and non-woven swabs or cotton wool balls (damp cotton wool or damp non-woven swabs are much kinder to friable skin than gauze and as there is no incision, fibre loss is not an issue)
 - Application of an ocular lubricant such as ointment into the lower fornix (Lenart and Garrity, 2000 So et al 2008, Masoudi Alavi et al 2014).
 - If passive closure cannot be maintained, the lid should be taped closed along the length of the lids. Care should be taken to use a tape that does not damage the skin of the patient. The tape should be applied along the length of the lid to avoid any opening
 - The creation of a moisture chamber using polyethylene wrap, over the closed lids and taped down around all edges from the brow to the cheek will help to maintain moisture levels (So et al 2008).
Polyethylene moisture chambers with adhesive edging are available.
- If infection is suspected, consideration should be given to the commencement of chloramphenicol ointment, or drops alongside normal lubricating ointment AFTER a set of bacterial swabs have been taken
- Regular assessment of the corneal epithelium should be undertaken using fluorescein drops or impregnated papers and a cobalt blue filter on the end of a pen torch
- If epithelial loss is identified, lubrication should be enhanced and response monitored
- Ophthalmic opinion should be sought if patients are not responding to enhanced lubrication or if any clouding, marking or haziness of the cornea is noted (Marshall et al 2008).
- All eye care and findings should be documented

Prevention of issues

The critical care area is a high risk area for eye infection after corneal epithelial loss due to a high incidence of respiratory pathogens, high gas flow, and the use of open suction techniques (need to generalise due to suction used for both oral and tracheal care). Prone positioning can damage the eyes if they are not cared for in particular. Patients often have other infections and surface wounds so cross infection is a possibility.

- Adequate hand washing is a key feature of infection prevention and control
- The possibility of splashes and aerosol contamination of the patients eyes from suction debris should be considered and, just as the nurse should use

personal protective equipment, the use of this for the patient (for example, an eye shield or goggles) should be considered

- Suction catheters should be kept well away from the patients face and eyes. When passing equipment across the patient, care should be taken to avoid the face and eyes so that neither aspirate nor equipment impact on the ocular surface

Evidence base

The eyes are not a sterile area and, with the rest of the surface of the body, are open to the air and all the contaminants within it. While the skin maintains an impermeable barrier, the surface of the eye is rather more delicate. The epithelium of the cornea, the main refracting surface of the eye is the main barrier to intraocular infection and maintains extremely tight cell junctions which effectively prevent bacterial ingress. The conjunctiva contains conjunctival associated lymphoid tissue which is part of the mucosal immune system and the tears contain antibodies and lysosyme which again, helps to deal with any pathogens impacting on the eye (Snell and Lemp 2013)

The integrity of the corneal and conjunctival epithelium is maintained by an adequate tear film containing, a critical mixture of watery fluid, mucin and oil. Deficiencies in the quality or quantity of the tear film result in dryness. Corneal and conjunctival epithelial tissue which dries out becomes non- viable, resulting in epithelial loss thus, in the cornea, the tight junctions are missing as cells are lost and pathogen ingress into corneal tissue and then deeper into the eye tissues can take place. This can result in severe loss of vision

It is critical therefore to maintain a moist corneal and conjunctival surface to avoid ocular infection (NEI 2016).

In a critical care environment, the eyes are very vulnerable. If the patient can maintain eye closure the cornea is protected to an extent, but blinking does not occur (which is a critical part of tear film production and distribution over the eye surface) so for long period of time there is no new tear film produced and stasis of what is there can encourage bacterial colonisation (Snell and Lemp 2013). If the patient cannot maintain lid closure, the ocular tissues will dry out, epithelial tissue will be lost (exposure keratopathy) and pathogen ingress is much more likely (Nei 2016). Mela et al (2010) found that the ocular surface of long-term sedated patients was found to be colonised by various bacterial species and their isolation was closely associated with the length of hospitalisation. Rosenberg et al's (2008) meta-analysis suggested that up to 42% of patients in the intensive care unit develop exposure keratopathy.

A number of ways have been suggested to prevent exposure keratopathy. Gel based dressings, placed over the lids have been used to prevent corneal epithelial loss however, Ezra et al (2005) found that 90% of their patients on whom these dressings were used developed exposure keratopathy and this tended to be more severe than in other treatment groups. This is because gel dressings do not keep the eyelids closed, appear to cause lid tissue oedema and can dry out if not cared for and as they need to be moist to work. As they are open to a bacteria laden atmosphere, they can harbour potential pathogens.

Taping the lids closed has been shown to be an effective strategy but on its own tends to fail to keep the eye lubricated and prevent epithelial loss (Lenart and Garrity 2000, Masoudi Alavi et al 2014)

Lubrication with ointment (whether containing antibiotic if the epithelial surface is compromised, or simply a lubricating ointment is effective (Lenart and Garrity, 2000 So et al 2008, Masoudi Alavi et al 2014) and should be repeated regularly to ensure

that lubrication is maintained. Passive lid closure, along with lubrication ensure that the lubricant stays where it is needed and the tissue does not dry out despite lubrication.

Moisture chambers made of a polyethylene material have been found to be very effective in preventing corneal exposure (So et al 2008) and may be more effective than lubrication (Zhou 2014). The additional benefit of a moisture chamber is that it acts as an eye shield for the patient, stopping any contamination from open suction, aerosol effects and atmospheric bacteria from contaminating the ocular surface.

What is very clear is that regular, evidence based, protocolised eye care can significantly reduce the complications of exposure keratopathy and its consequences for vision (Azfar et al 2013, Demirel et al 2014) and education programmes to enhance knowledge of the reasons for eye care and the evidence behind it are important in introducing and maintaining this change in practice (Demirel et al 2014)

Literature

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Further reading

Australian Critical Care Institute (2013) *Eye care for Critically Ill Adults* ACI

Reflective activity

How do you think this article will change your practice?

How could you use this resource to educate your colleagues?