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ICU Manual for NURSES

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CHAPTER

Eye Care

Prajakta Samir Hindlekar

Eye care is recognized as a basic nursing care procedure essential for critically ill patients to prevent complications such as eye infection or injury. Standards of care delivered in critical care units (CCU) cannot be complete without including eye care clinical practice guideline.

INTRODUCTION

Many critically ill patients have altered levels of consciousness which may impact on the protective mechanisms of the eye. When unprotected, the eye is at risk of injury, such as corneal dehydration, abrasion, perforation and infection. The reported incidence rates for corneal abrasion vary widely in the international health care literature; 3–60% intensive care patients are affected. The provision of fundamental eye care to this patient population is essential and particularly important in the first 2–7 days, when the peak incidence of iatrogenic eye injury occurs.

REVIEW ON SIGNIFICANCE OF PROTECTIVE PHYSIOLOGICAL MECHANISMS IN THE EYE

An important consideration to guiding assessment and management is to have thorough understanding of the normal physiological mechanisms that provide protection against eye injury and infection.

1. Eyelid closure and blinking provide a mechanical barrier to injury and prevent dehydration and the desiccation of the outer eye epithelium.
2. Conjunctiva, the thin protective layer of epithelium that forms a mucous membrane covering the anterior surface of the eye, protects the eye from mechanical injury and invasion from micro-organisms.
3. Tear formation is an important component of the outer eye defense mechanisms. Tears maintain a moist environment for the surface epithelium of the outer eye and form a smooth optical surface over the cornea. Tears lubricate the eyelids, wash away foreign material and cell debris, prevent adherence of organisms to the ocular surface, and transport

oxygen to the outer eye surface. In the event of injury or infection, leukocytes are transferred to the injured area in tear fluid. Additionally, proteins such as immunoglobulin, lysozyme and lactoferrin are found in tears and inhibit bacterial growth. The action of blinking facilitates the distribution of tears to the whole of the ocular surface.

ALTERED EYE PHYSIOLOGY IN CRITICALLY ILL PATIENTS

For the critically ill patient, normal protective mechanisms such as eyelid closure during sleep and an intact blink reflex may be altered because of the use of sedation and muscle relaxants or because of underlying medical conditions that alter the patient's level of consciousness. Sedation and the use of neuromuscular blocking agents affect the orbicular muscles of the eye and the eyelid may appear to be closed. However lagophthalmos (incomplete eyelid closure) may still occur, contributing to drying of the mucosal surface and desiccation of the epithelial tissues and may result in ulceration (exposure keratopathy). The resulting lesions can range from punctate epithelial erosions involving the exposed inferior third of the cornea to more extensive erosion or macro-epithelial defect. The disruption to the epithelial surface increases the risk of bacterial infection.

In addition to the alteration of normal eye protective mechanisms, the intensive care unit (ICU) environment also presents an environment rich in pathogens that may contribute to the increased exposure of the ocular surface to microorganisms.

For these reasons meticulous eye care is required to minimize the development of iatrogenic ophthalmologic complications, which, if not resolved, may result in serious visual impairment.

POTENTIAL EYE PROBLEMS FOR CRITICALLY ILL PATIENTS

1. Superficial keratopathy, which is a non-inflammatory disease of the cornea due to exposure and drying of the eye which can lead to ulceration, perforation and scarring, which though usually self-limiting, may cause permanent damage.
2. Superficial corneal abrasions which are common, due to eye exposure.
3. Keratitis which refers to any inflammation of the cornea, and in particular relates to infection. Bacterial or exposure keratitis is considered a dire complication associated with corneal exposure.
4. Inflammation of the conjunctiva, termed conjunctivitis, is also a risk and is caused by bacterial or viral infection, allergy or environmental factors.

In the ear of accreditation, corneal abrasions, conjunctival edema and infection have commonly been cited as adverse events.

INCIDENCE OF COMMON EYE PROBLEMS

Current literature suggests that the incidence of corneal abrasions ranged from 3.33% to 22% of the intensive care population. During a prospective analysis of 50 randomly selected intensive care patients, one study found corneal abrasions in 40% of patients. Another study suggested that up to 60% of ICU patients who receive sedation for longer than 48 hours may get corneal abrasions, and that the majority of these were detected in the first week of admission.

Existing Eye Care Practices

Eye care for intubated and ventilated patients receiving sedation or muscle relaxation varies greatly between intensive care units in terms of the method and frequency of eye care. Eye care has generally involved a regimen of cleaning the eyes every 2–4 hours with sterile water or normal saline and the installation of a lubricating liquid such as methylcellulose. Eye ointment is used where there is evidence of eye injury or the risk of injury is thought to be increased, for instance where conjunctival edema is present. Where there is evidence of conjunctival or corneal exposure, methods such as eye taping, padding, application of ointment, and application of polyethylene film are described, however, from the available evidence it is unclear, if any of these methods contribute to ocular surface protection separate from their contribution to eyelid closure. Because of the dearth of research about eye care in the critically ill patient population, it is also unclear which of these is most effective in maintaining eyelid closure.

Recommendations from various studies searched related to eye care in critical care unit are as follows:

Assessment Guidelines

1. Each patient is assessed for:
   - Risk factors of iatrogenic ophthalmologic complications
   - Ability to maintain eyelid closure and
   - Iatrogenic ophthalmologic complications.
2. Frequency of assessment: every 2–4 hours.

Eye Care Recommendations

1. Eye care should be part of the care provided to all people during their admission to intensive care units.
2. Ointments and drops are more effective at reducing the incidence of corneal abrasions than no eye instillations.

3. Polyethylene covers (Gladwrap) are more effective at reducing the incidence of corneal abrasions than ointments and drops.
4. Eyelid closure to be maintained if eyelid closure cannot be maintained passively; all patients who cannot achieve eyelid closure independently should receive eye care every 2 hours, i.e. cleaning with saline soaked gauze and the administration of an eye specific lubricant.
5. A timely referral is made for any suspected iatrogenic ophthalmologic complications.
6. Monitoring the rates of iatrogenic ophthalmologic complications. It is to be included as one of critical care quality indicators.

There is evidence that the eye care practice is given low priority, one need to have further studies to get in-depth information on recommendations for assessment, specific care and monitoring of ophthalmological complications together with best practice recommendations for prevention not included in previous eye care guidelines.

One needs to ensure dissemination and implementation of guidelines, which will improve eye care practices and morbidity for ICU patients. Inclusion of ophthalmological complications in quality of care performance indicators will have the dual effect of increasing awareness and highlighting areas for improvement in the practice of preventing potentially catastrophic ophthalmological complications. Early identification and prompt referral to ophthalmology experts has the potential to enhance patient outcomes.

FURTHER READING

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ICU Manual for NURSES

Salient Features

- A brief handbook for nurses
- Presents the subject matter in a lucid and easy-to-grasp manner
- Covers all the aspects of critical care medicine precisely
- Useful for the ICU nurses in their day-to-day practice
- Targeted to the students pursuing Indian Diploma in Critical Care Nursing course.

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He is a teacher/examiner of FNB and ISCCM Fellowship Course (Critical Care). He is credited with numerous publications in peer reviewed journals and has authored chapters in various textbooks. He has been invited as faculty for the Indian Society of Critical Care Medicine annual conferences continuously from 2003 to 2016. He has been elected as a Member Executive Committee ISCCM (two terms) and Secretary (one term). He is presently member in the Editorial Board of Indian Journal of Critical Care Medicine.

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