



Study on Ocular Surface Disorders in Intensive Care Unit Patients

KEYWORDS

Gait, Emotions, data set, 3D model.

Dr.Somesula Anuradha

M.S, Professor of ophthalmology,

Dr. Puspa latha

M.S, senior resident Kurnool medical college

Dr.K. Bharani kumar reddy

M.S, Assistant professor of ophthalmology, Kurnool medical college

Dr.B Latha

Assistnat Professor of Ophthalmology, Kurnool Medical College

ABSTRACT *The aim of our study was to determine the ocular surface disorders in intensive care units patients, identifying predisposing factors, assessing the effectiveness of eye care being practiced in intensive care units.*

A prospective study was done at intensive care, government general hospital, on 200 consecutive patients from May 2011 to October 2012. Of these, 65 patients had ocular surface problems. These were treated with simple measures like lid taping, topical application of lubricants and new method of preventive eye care that is usage of polyethylene covers as eye goggles which is most cost effective, to avoid complications like exposure keratitis, corneal ulcer etc.

Introduction

Intensive care units cater to patients with most serious injuries and illnesses, most of which are life threatening and need constant, close monitoring, support from specialised equipment and medication in order to maintain bodily functions. They are staffed by highly trained doctors and critical care nurses who are specialised in caring and treating the patients. Also intensive care unit setups are nidus for nosocomial infections.

Ocular surface problems are frequent in intensive care unit patients due to impaired ocular defence mechanisms, metabolic derangements and impaired mental status etc. All these may lead to a wide array of eye problems like dry eye, conjunctivitis, chemosis, keratitis, corneal erosions, corneal ulcerations and exposure keratitis.

Materials and methods

Source of data: Study was done from May 2011 to October 2012, on 200 patients, who were admitted to medical, surgical, paediatric and neurosurgery intensive care units of Kurnool medical college. These patients were referred to department of ophthalmology either for ocular complaints or for routine ophthalmologic evaluation. The study protocol was cleared by ethics committee of the institution. Data was collected from patients, relatives and from medical records which included demographic details like name, age, etc, details of intensive care unit admission like date of admission and number days of stay, diagnosis, reason for ophthalmic consultation. General examination was done and special attention given to level of consciousness using Glassgow coma score, mechanically ventilated or not and presence or absence of sedation. A detailed bedside ocular examination was done including visual acuity testing, anterior segment examination, Schirmer's test, examination of the cornea after fluorascin staining with direct ophthalmoscope using blue filter, microbiological investigations and fundus examinations in required patients.

The presence of conjunctival xerosis, chemosis, congestion and mild mucopurulent discharge are considered as mild ocular surface disorders. Presence of corneal involvement is considered as severe ocular surface problem.

After assessment of ocular condition, treatment was prescribed based on severity. Lubricants were prescribed to conjunctival and corneal xerosis, antibiotics and lubricants for conjunctival congestion and keratitis, lids were taped with micro adhesive tape plaster and lubricants were prescribed in cases of inadequate lid closure with no conjunctival congestion and discharge. In case of inadequate lid closure with conjunctival congestion and keratitis polyethylene covers were used as eye goggles along with antibiotics and lubricants. Patients with severe ocular surface disorder were followed up daily and others once in two days and progress monitored until they were discharged and for one month after discharge.

Discussion

200 patients were studied, who were admitted in medical, surgical, paediatric and neuro surgery intensive care units of Kurnool medical college. Their ages range from 1 to 80 years. Mean age 21.09 years and a standard deviation of 20.50 years. In our study the cause of admission into intensive care units ranged from acute infections, complications related to systemic illnesses, trauma and related surgical causes and poisoning. 20% of patients in our study were found to be ventilated and sedated. The level of consciousness of patients were assessed by the Glassgow coma scale, with a minimum score of 0- 3 (unconscious patient) to a maximum score of 15(patient is conscious). Of 200 patients 55 were found to have systemic illness, of which 10 patients were diabetic, 21 had hypertension, 16 had a combination of diabetes and hypertension, 6 patients had a seizure disorder and 2 were known asthmatics., 46 patients were found to had inadequate lid closure with exposure of cornea and conjunctiva. In our study 65 patients

who were found to have ocular surface disorder, 22 patients had a mild ocular surface disorder and 43 had a severe ocular surface disorder. The results were higher when compared with the studies of H Imanaka et al, shows the difference in Indian scenario and lack of awareness regarding basic preventive eye care in our intensive care units.

The following variables were statistically analyzed with the severity of the ocular surface disorder to assess their strength of association: 1.Number of days of stay in intensive care unit 2. GCS Score 3.ventilatory status sedation4. adequacy of lid closure and 5.presence of systemic illness like diabetes and hypertension. The incidence was 21.11% in those with Glassgow coma score of <11and 46.5% in those with score of <5 as noted by earlier studies.The incidence was 64.1% in ventilated and sedated patients as compared to 24.84% in non-ventilated and non-sedated patients, the results were comparable with studies by Mercieca et al. , as these patients are subjected to frequent tracheal suctioning, if proper precautions are not taken during suctioning, these secretions are likely to contaminate the eyes resulting in ocular surface disorders. In our study the incidence was 78.2% in patients with inadequate lid closure as compared with 25.3% in those with adequate lid closure,as constant corneal exposure leads to impairment of defense systems of the eye. The incidence was found to be 47.2% in patients with associated systemic illness like diabetes, hypertension probably due to poor corneal sensitivity due to neuropathy. The incidence was high in patients admitted in neuro surgery intensive care unit, probably the priority being given only to improve the general condition of the patient. And it was discovered that no routine evaluation of the ocular status was being performed nor preventive measures adopted in our intensive care units.

Among the 65 patients who were found to have ocular surface disorder, only 6(9.23%)patients had been diagnosed and given treatment by the primary physician,20(30.76%) were diagnosed but not treated adequately,39(60%)patients still remain undiagnosed, reflecting the gross inadequacy in promptly recognizing and managing ocular surface problems in critically ill patients.

Among 200 patients studied, 50 patients expired, 22 were discharged against medical advice, 18 were shifted to general wards and110 were discharged after they were improved. Among 110, 65 patients turned for follow up. A majority of these patients had no ocular surface disorders during their stay in intensive care unit and the others were those who were treated adequately. Thus when managed adequately, by simple measures like lid taping, topical antibiotics and lubricants can prevent ocular complications in critically ill patients, which can otherwise be vision threatening.

SUMMARY AND CONCLUSIONS:

The study was conducted for 1 year and 5 months and aimed to analyze the pattern of ocular surface disorders among critically ill patients, to identify predisposing risk factors and also attempted to evaluate the effectiveness of the eye care regimen being followed in our Intensive Care Units. It was found that the commonest ocular surface disorders detected were conjunctival manifestations like xerosis, congestion and muco purulent discharge and corneal manifestations like corneal xerosis and ulceration. The incidents of ocular surface disorders in our study was 32.5% The high incidence and severity were found to be

associated with inadequate lid closure, a lower Glassgow score, presence of systemic illnesses , presence of ventilation and sedation. We also found that use of polyethylene covers (used as goggles) in patients with exposure keratitis would be more helpful than lid taping as these goggles would help us asses the ocular movements and pupil reactions through them in addition to maintain a protective moist chamber for the eyes.

Preventive eye care has been an overlooked aspect of care of critically ill patients. Frequent inspection of eyes for prompt and adequate management is of utmost importance, even when survival of the patient is in doubt. Various preventive measures have been advocated by different authors > for the prevention of ocular disorders in critically ill patients, which included periodic examination of eyes, topical lubricants, polyacrylamide gels, taping of eye lids and moist chambers.

The following measures would help in preventing ocular surface complications in critically ill patients:

Regular inspection of the ICU patients, taping of the lids with micro-adhesive tape plaster or moist chamber to be provided to prevent exposure complications. Topical antibiotics should be used in patients with conjunctival congestion, discharge and keratitis. Unconscious and sedated patients would receive 2 to 4 hourly eye care. Hand hygiene and wearing of gloves by the attending staff before performing eye care to prevent cross infections. Tracheal suctioning should take place from the side of the bed and should be done only after covering the patient's eye and referral in a timely manner for any iatrogenic ophthalmic complications.

The following conclusions are drawn from our study:

Ocular surface disorders are common in critically ill patients admitted in Intensive Care Units, The most frequently encountered ocular surface problems in these patients are conjunctivitis and exposure keratitis, occur more commonly in those patients who are unable to close their lids completely, who are mechanically ventilated and sedated, in those with low levels of consciousness, and in those with severe systemic illness. When detected on time and managed promptly and adequately, ocular surface problems can be easily cured by simple and effective techniques like use of lubricants, antibiotics, taping of the eye lids and use of polyethylene goggles. But when neglected and left untreated, these seemingly minor problems can lead onto serious complications like corneal ulceration, perforation and endophthalmitis resulting in significant visual loss. The key to the effective management is preventive eye care to be practiced by the medical and nursing staff of the intensive care units, in coordination with the ophthalmologists. Preventive eye care includes routine and frequent examination of eyes of all patients admitted in intensive care units and adoption of measures like frequent application of ocular lubrications, taping of the eye lids and use of polyethylene goggles in patients with inadequate lid closure. Use of polyethylene covers over the eyes would provide humid environment and a moist chamber, there by reducing the risk of dryness. Also simplicity of application and easier maintenance (i.e. need not be applied every 2 to 4 hrs as with lubricants) makes it the method of choice for preventive eye care in Intensive Care Unit patients. These would also help visualization of the anterior segment and pupil reactions if there is gross exposure. We would suggest refinements like creating a chamber with in polyethylene covers to place a wet cotton swab to provide a moist

environment to prevent dryness and related complications. Temporal tarsorrhaphy also has a definite role in preventing exposure keratitis in required cases.

Table 1: Ventilatory status and sedation verses Ocular Surface Disorders

Ventilatory status	Ocular Surface	Order		Total
	Nil	Mild	Severe	
Non ventilated	121	11	29	161
Ventilated	14	11	14	39
Total	135	22	43	200

[Chi-Square (X²) = 24.9,probability (P)<0.001]

Table 2: Ocular Surface Disorder Vs ICU admitted

	Ocular Surface	Order		Total
	Nil	Mild	Severe	
MICU	83	10	28	121
NSICU	8	1	7	16
PICU	33	9	6	48
SICU	11	2	2	15
Total	135	22	43	200

[Chi square (X²) =10.8 ; P = 0.095]

REFERENCE

1. Gixti A, Sadri M, Edgar J, Datta AV.Common ocular Surface disorders in patients in intensive care units. In: The Ocular Surface volume 10, Issue 1, Jan2012, 26-42. | 2. Desalu, F. Akinsola, O. Adekola, O. Kushimo, A. Adefule-Ositelu: Ocular surface disorders in intensive care unit patients .The Internet Journal of Emergency and Intensive care Medicine | 3. Gupta JS, Jain IS, Kumar K: Lid retraction secondary to contralateral ptosis. Br J Ophthalmol 48:626-627,1967. | 4. Mercieca F, Suresh P, Morton A, Tullo A B. Eye care for the critically ill. Intensive care Med. 2000 Nov; 26(11):1714. 5. Kocacal Guler E, Eser I, Egrilmez S. Effectiveness of polyethylene covers versus carbomer drops to prevent dry eye syndrome in critically ill. Jour of Clin Nurs 2011 jul; 20(13-14):1916-22. 5. Bates J, Dwyer R, O Hegarty N. Corneal protection in critically ill patients. Clinical Intensive Care. 2004. 6. Rosenberg JB, Eisen LA. Eye care in the intensive care unit. Critical care medicine 2008 Dec; 36(12):3151-5