



International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

ISSN:2347-6567

IJAMSCR |Volume 5 | Issue 1 | Jan - Mar - 2017
www.ijamscr.com

Research article

Medical research

A study of incidence of dry eye in critically ill patients in intensive care unit

Kalpana Ramamoorthy^{*1}, Kanmani Kothandaraman²

¹Resident, Department of Ophthalmology, Saveetha Medical College and Hospital, Chennai, Tamilnadu, India.

²Professor and HOD, Department of Ophthalmology, Saveetha Medical College and Hospital, Chennai, Tamilnadu, India.

*Corresponding Author: Kalpana Ramamoorthy

ABSTRACT

Aim

To evaluate the incidence of dry eye in critically ill patients hospitalized in the Intensive care unit.

Materials and methods

A Prospective case control study of 40 patients, aged between 19-55 years who were hospitalized in the Intensive care unit in a tertiary care hospital for more than 7 days, of which 16 patients were ventilated and 24 patients were not ventilated. All patients were subjected to Tear secretion assessment by Schirmer's test 1 and Ocular surface damage assessment by corneal staining using fluorescein dye.

Conclusion

Prevalence of dry eye was more in the older age and the Schirmer's test value in patients with dry eye among those who were ventilated and not ventilated was 7.2+/-4.7 (p value<0.005) and 8.4+/-7.2(p value<0.005) and they were treated empirically. Conjunctival chemosis, Conjunctival hyperaemia, purulent or mucopurulent secretion, Corneal staining and Keratitis were observed in 20%, 22.5%, 12.5%, 7.5%, 5% of the patients respectively and were treated accordingly. Incidence of dry eye was 10% on 8th day and 17% on 14th day. The parameters did not show statistically significant difference according to mechanical ventilation or not. As patients in the Intensive care unit are more susceptible to develop dry eye, keratopathy, and ocular infections, they should be consulted by an ophthalmologist for early diagnosis of ocular surface disorders.

Keywords: Keratopathy, Ocular surface damage.

INTRODUCTION

Dry eye, a multifactorial disease of the tear film and ocular surface, due to reduced tear production or excessive tear evaporation that causes potential damage to the ocular surface [1]. The patients in the intensive care unit who are unconscious and on mechanical ventilation, sedation or muscle

relaxants due to inadequate eyelid closure and impaired ocular defence mechanism or due to the low relative humidity in the ICU are more prone for dry eyes, keratopathy or ocular infections and various studies have reported that [2], the incidence of ocular surface disorder was more in the patients in the Intensive care unit [3]. ICU medical staff are primary concerned with life threatening conditions,

therefore failure to recognize the ocular signs and symptoms will lead to complications like corneal ulceration, perforation [4], opacities and permanent ocular damage. Hence the aim of our study is to know the incidence of dry eye in critically ill patients hospitalized in the Intensive care unit [5].

MATERIALS AND METHODS

A Prospective case control study of 40 patients in the Intensive care unit of Saveetha Medical College and Hospital of which 16 patients were ventilated and 24 patients were not ventilated were taken up for the study after applying the following inclusion and exclusion criteria to study the incidence of dry eye [6].

Inclusion Criteria

Study included critically ill patients, aged 15 to 70 years with no gender bias, who were hospitalized in the Intensive care unit for more than 7 days [7].

Exclusion criteria

- Primary and secondary Sjogren's syndrome
- Primary and secondary Lacrimal gland deficiencies
- Lacrimal obstructive diseases, Chemical or Thermal injuries, Post-radiation fibrosis.
- On systemic medications known to cause dry eyes or chronic use of topical medications.
- Reflex hyosecretion in chronic contact lens users, diabetes, post refractive surgeries, V or VII cranial nerve damages, post infective (herpes simplex and zoster)
- Disorders of lid aperture and lid/globe congruity (craniostenosis, proptosis, endocrine exophthalmos)
- Vitamin A deficiency [8].

After obtaining an informed consent from the relatives of the patient, patient's name, age, sex, occupation, systemic comorbidities, drug history and past surgical history and the duration of the

hospital stay were recorded. Detailed anterior segment examination was done with a portable slit lamp on the 8th day and 14th day of hospitalization. The following examination was done [9].

- Eye Lids, eye lashes-chemosis, infections, crusting and lid closure.
- Conjunctival sac-debris, purulent or mucopurulent discharge.
- Bulbar Conjunctiva- hyperaemia, dry lustreless appearance.
- Cornea- dry, lustreless, hazy look, irregular surface, filaments, keratitis, ulcers and scars.

Schirmer's test I was performed to determine the rate of tear secretion without applying topical anaesthesia by inserting a Schirmer's test strip into the inferior fornix, at the junction of middle and lateral one third of the lower eyelid margin for 5 minutes. After 5 minutes the strip was carefully withdrawn and the length of the wet strip was noted in millimetres (mm). Tear secretion value of less than 10mm was regarded as abnormal. Ocular surface damage assessment done by using a blotting paper containing fluorescein dye after applying a topical anaesthesia 0.5% proparacaine and the corneal epithelium damage was evaluated using a cobalt blue filter of the slit lamp. Patients who were detected with dry eye were started on empirical treatment which included ocular lubrication with artificial tear drops every 6 hours and ointments twice a day and in case of ocular infections antibiotics were prescribed. The study was analysed using SPSS software by Student T test and the analysis of non-parametric values were done by Mann Whitney U test. P value of less than <0.005 was considered significant.

RESULTS

Among 40 patients there were 25 men and 15 women who were included in the study of which 6 male and 4 female patients had dry eye (Fig -1) and the prevalence was more in the older age (Fig-2)

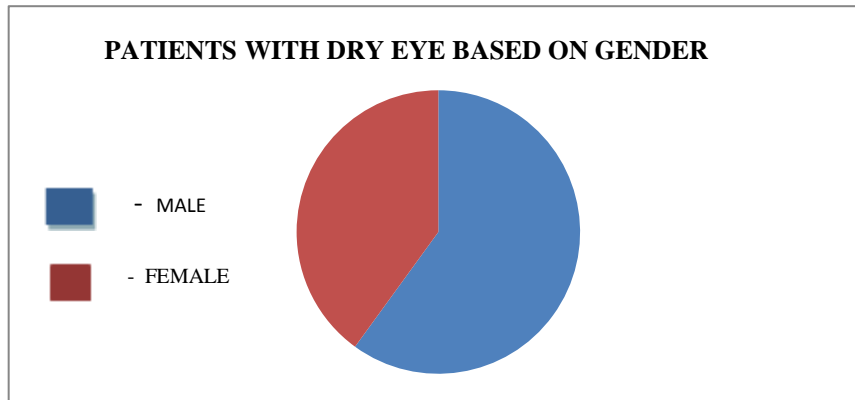


Figure-1

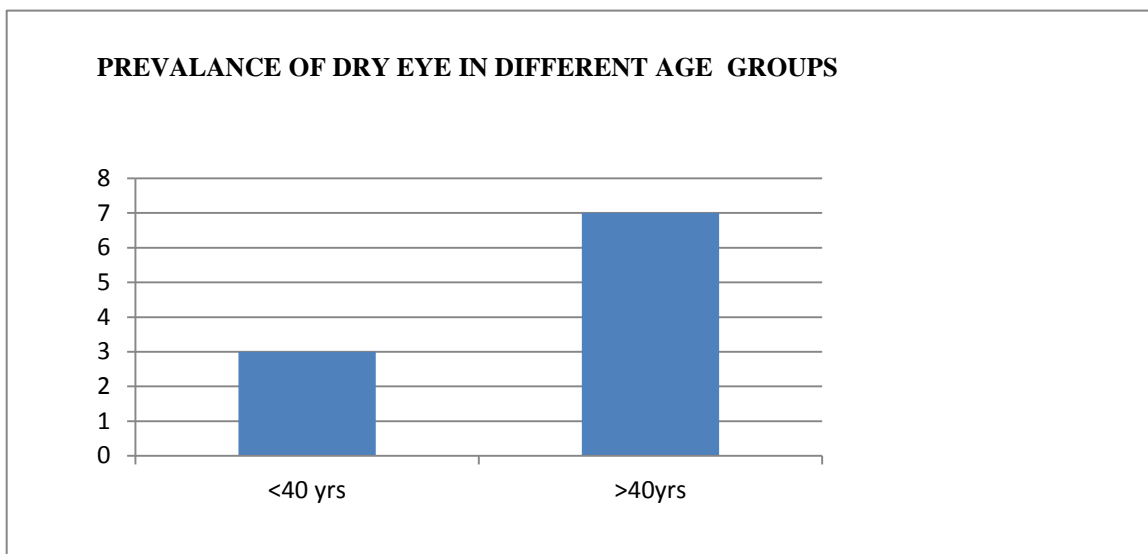


Figure -2

Based on the stay in the hospital, the incidence of dry eye increased with longer hospital stay (Fig-3). Four patients (10%) were diagnosed with dry eye on the 8th day and six patients (17%) with dry eye on 14th day. Two out of four patients detected

with dry eye on the 8th day improved with empirical treatment and 2 worsened in spite of treatment, on reassessment with Schirmer's test on 14th day.

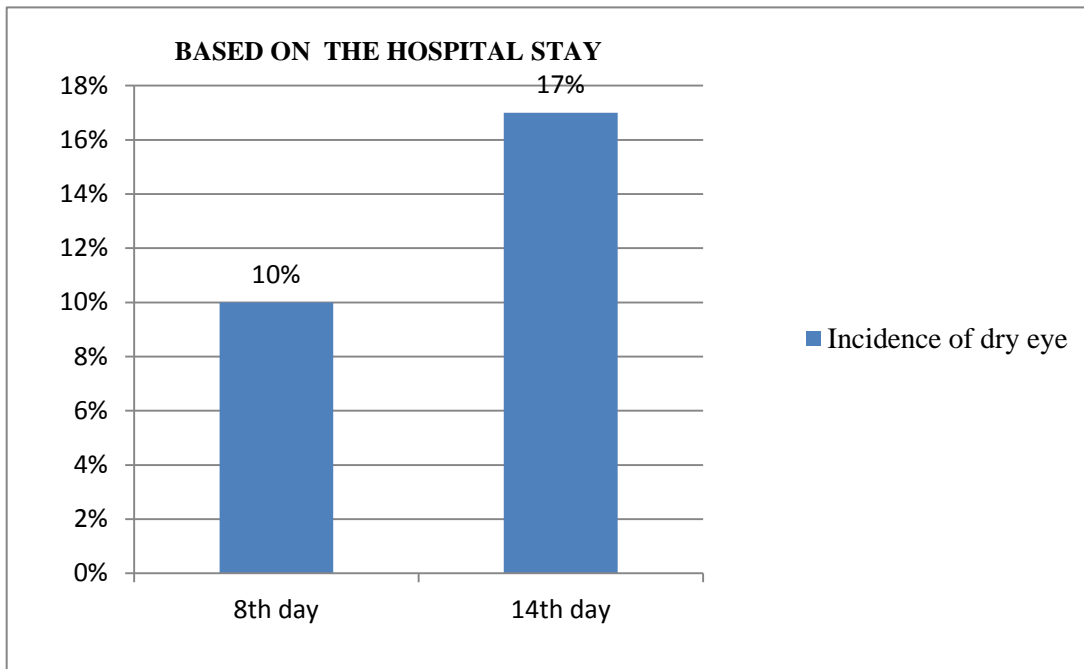


Figure-3

Patients in the Intensive care unit among those patients who were not ventilated 6 patients had dry

eye and who were ventilated 4 patients had dry eye (Fig-4)

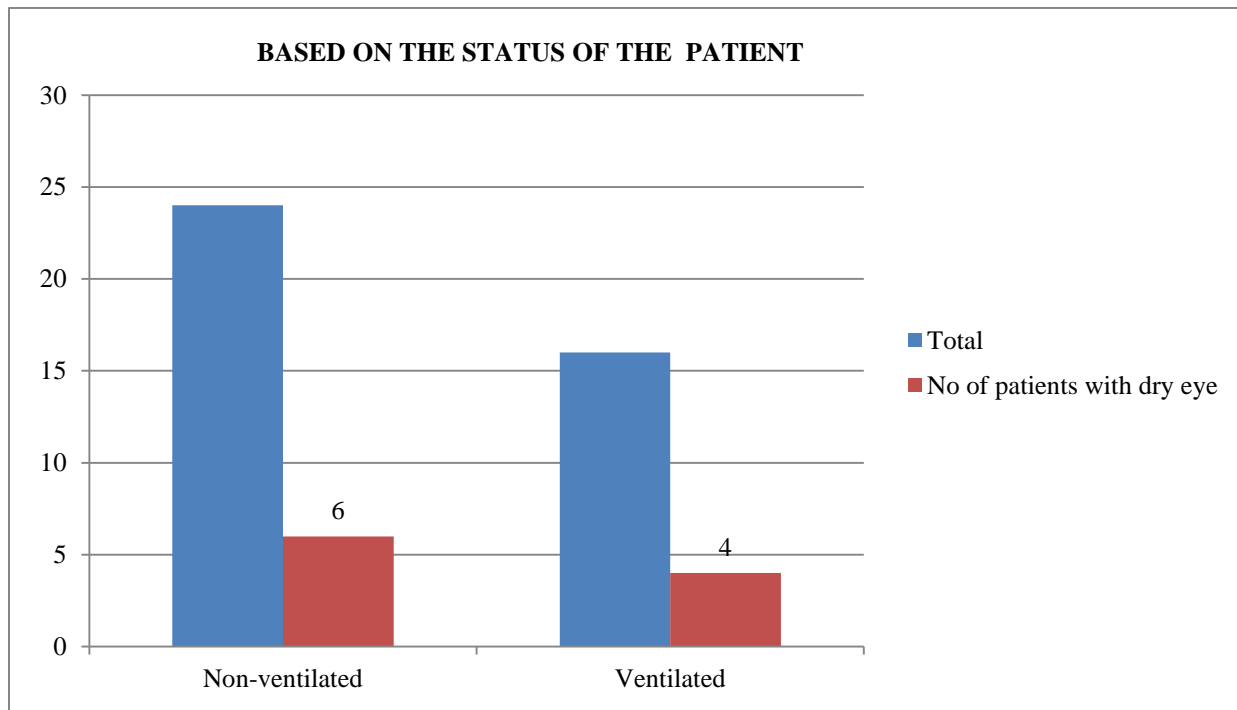


Figure-4

The following (Table-1) were the Schirmer's test values of the critically ill patients with dry eye

among those who were ventilated and not ventilated.

Table 1: Schirmers test value in patients with dry eye

Mechanical ventilation	Schirmer's test value mm/5min	
	OD	OS
Yes	7.0+/-4.5	7.5+/-4.9
No	8.0+/-7.2	8.9+/-7.2
P value	0.29	0.37

OTHER OCULAR FINDINGS

Conjunctival chemosis-8 (20%)



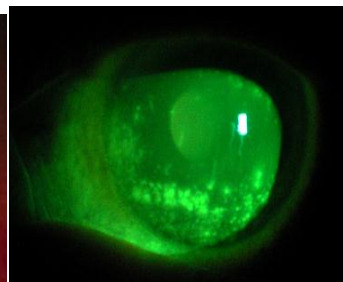
Conjunctival hyperaemia-9(22.5%)



Secretion-5 (12.5%)



Corneal Staining-3(7.5%)



Keratitis-2(5%)



DISCUSSION

Dry eye is a risk factor for corneal abnormalities and ocular infections which are often missed leading to severe ocular complications. From the analysis of the articles there is a large portion of studies (76.5%) describing the Schirmer's test as a method to detect dry eye. According to the study (SaritasTb et al³) the incidence of dry eye was in 40% of the patients when considering Schirmer's value <5mm and in our study the incidence was 10% on 8th day and 17% on 14th day when considering Schirmer's value <10mm. Our study is in accordance with other studies^(3,4) in which there was no significant difference of dry eye in patients either on ventilation or sedation or not. Moreover, research reports that patients admitted in the Intensive care unit are more likely to develop not only dry eye but

also keratopathy and ocular infections which is consistent with the findings in our study. Another study suggests that ICU patients who receive sedation develop corneal abrasion, detected in 42% of cases in the first week of hospitalization which in turn leads to high risk of infections⁷. Thus knowledge about dry eye and ocular surface disorders can foster the provision of appropriate planning and interventions, early detection of dry eye risk, as well as generation of protocols for further management.

CONCLUSION

In our study, 10 out of 40 critically ill patients were detected with dry eye after 1 week of hospitalization with a slight male preponderance and incidence of dry eye was increased with longer hospital stay. We also found that prevalence of dry

eye was more in old patients. There was no significant difference of dry eye in patients either on ventilation or not. Hence timely ophthalmological consultation and appropriate

nursing care along with constant monitoring is required to minimize ocular morbidity and vision loss in critically ill patients.

REFERENCES

- [1]. The definition and classification of dry eye disease: report of the Definition and Classification Subcommittee of the International Dry Eye WorkShop (2007). *Ocul Surf* 5(2), 2007, 75-92.
- [2]. Alves M, Fonseca EC, Alves MF, Malki LT, Arruda GV, Reinach PS, et al. Dry eye disease treatment: a systematic review of published trials and a critical appraisal of therapeutic strategies. *Ocul Surf.* 11(3), 2013, 181-92.
- [3]. Tuba Berra Saritas,¹ * Banu Bozkurt,² Baris Simsek,¹ Zeynep Cakmak,³ Mehmet Ozdemir,⁴ and Alper Yosunkaya¹. Ocular Surface Disorders in Intensive Care Unit Patients. *ScientificWorldJournal*. 2013.
- [4]. Imanaka H¹, Taenaka N, Nakamura J, Aoyama K, Hosotani H. Ocular surface disorders in the critically ill. *Anesth Analg.* 1997.
- [5]. Alavi NM, Sharifitabar Z, Shaeri M, Hajbaghery MA. An audit of eye dryness and corneal abrasion in ICU patients in Iran. *Nurs Crit Care.* 19(2), 2013, 73-7.
- [6]. American Academy of Ophthalmology Cornea/External Disease Panel. Preferred Practice Pattern Guidelines. Dry Eye Syndrome
- [7]. Nember J. Eye Care for Patients in the ICU. *Best Practice – The Joanna Briggs Institute.* 106, 2006, 72A-72D
- [8]. Bloomenstein M, Cunningham D, Gaddie IB, Karpecki P, Morris S, Nichols K. Improving the screening, diagnosis, and treatment of dry eye disease: expert recommendations from the 2014.
- [9]. Methods for Detection of Dry Eye in Critically Ill Patients: an Integrative Review *International Archives of Medicine Section: Ophthalmology* ISSN: 1755-7682.

How to cite this article: Kalpana Ramamoorthy, Kanmani Kothandaraman. A study of incidence of dry eye in critically ill patients in intensive care unit. *Int J of Allied Med Sci and Clin Res* 2017; 5(1): 247-252.

Source of Support: Nil. **Conflict of Interest:** None declared.