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Original Article

Clinical-epidemiological profile of surgical patients with ocular dryness and risk of dry eye

Perfil clínico-epidemiológico de pacientes cirúrgicos com ressecamento ocular e risco de ressecamento ocular

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ABSTRACT

Objective: to determine clinical and epidemiological profile of surgical patients with ocular dryness and to the Nursing diagnostic and risk of dry eye, in the postoperative period. **Methods**: cross-sectional study, with 82 patients in the postoperative period. For analysis, it were used frequencies, the distribution centers' measures and respectives variabilities. **Results**: equivalent prevalence between ocular dryness and the nursing diagnosis. The average age was 57.7 years for patients with ocular dryness and 59.6 years for those with risk diagnosis. In both groups, there was a predominance of females, cardiovascular surgeries and general anesthetic usage. The length of the surgical procedure averaged 105 minutes for patients with ocular dryness and 67.5 minutes for those with risk diagnosis. **Conclusion:** predominance of women in middle age undergoing elective surgeries by cardiovascular reasons for both groups, however, with distinct time of surgical procedure.

Descriptors: Standardized Nursing Terminology; Nursing Diagnosis; Nursing Process; Postoperative Period; Dry Eye Syndromes.

RESUMO

Objetivo: determinar o perfil clínico-epidemiológico de pacientes cirúrgicos com ressecamento ocular e com o diagnóstico de enfermagem Risco de ressecamento ocular, no período pós-operatório. **Métodos**: estudo transversal, com 82 pacientes em pós-operatório. Para análise, utilizaram-se as frequências, medidas do centro de distribuição e respectivas variabilidades. **Resultados**: prevalência equivalente entre o ressecamento ocular e o diagnóstico de enfermagem. A média de idade foi 57,7 anos para pacientes com ressecamento ocular e 59,6 anos para aqueles com o diagnóstico de risco. Em ambos os grupos, existiu predominância do sexo feminino, cirurgias cardiovasculares e uso de anestésico geral. O tempo de procedimento cirúrgico obteve mediana de 105 minutos para pacientes com ressecamento ocular e 67,5 minutos para aqueles com o diagnóstico de risco. **Conclusão:** predominância de mulheres em meia idade submetidas a cirurgias eletivas de motivos cardiovasculares para ambos os grupos, entretanto, com tempo de procedimento cirúrgico distinto.

Descritores: Terminologia Padronizada em Enfermagem; Diagnóstico de Enfermagem; Processo de Enfermagem; Período Pós-Operatório; Síndromes do Olho Seco.

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Introduction

The World Health Organization launched, in 2019, the first global report on vision, produced during the 70th World Assembly of Health, in partnership with specialists from all around the world, portraying the magnitude of ocular conditions and impairment of vision of the world population. It presents that at least 2.2 billion people are living with some visual impairment and, among these, at least one billion cases could have been prevented by means of preventive actions and early detection[1].

The dry eye was redefined recently by the Dry Eye Workshop II as one disease derived from multiple factors related to instability of the tear film, which is characterized by onset of ocular signs and symptoms arising from hyperosmolarity, inflammation and the homeostatic deficit of ocular surface or neurosensory abnormalities. According to the document, this is a global issue, responsible for high rates of demand for ophthalmic specialized evaluations and that affects approximately 344 million people worldwide[2].

The ocular dryness, in turn, is characterized as a clinical condition, identified by undesirable human response to tear film insufficiency, which may alter the integrity of the ocular surface and is under the responsibility of nursing[3-4].

The system of standardized language Nanda International (NANDA-I) contains a nursing diagnosis Risk of dry eye, whose definition is "Susceptibility to ocular discomfort or damage to the cornea and conjunctiva due to the reduced quantity or quality of tears to moisturize the eye that can compromise health"[5:809].

Amongst the risk factors to the nursing diagnosis Risk of dry eye are: air conditioning, insufficient knowledge of modifiable factors, vitamin A deficiency, wind excess, sun exposure, caffeine intake, prolonged reading, air pollution, smoking and low humidity. It presents as population of risk: senior aging, history of allergy, female gender and contact lens wearers. And, as associated conditions: hormonal change, damage to the ocular surface, autoimmune disease, neurological injury, with loss of sensory or motor reflex, treatment regimen and mechanical ventilation[5].

Patients submitted to procedures at the cirurgical center and admitted to Intensive Care Unit have a higher probability of developing ocular alterations, since these environments possess low temperature and, sometimes, low air humidity. In addition, the patients, at most, use mechanical ventilatory assistance and pharmacological treatments that may predispose the eye's dryness[6]. When the predictor factors go unnoticed by the health team, the patient can suffer damage and develop visual disorders capable of jeopardizing the activities of daily life and, consequently, the Quality of life[3].

Given what was elucidated on the clinical problem in the setting of the cirurgical center and Intensive Care Unit, it was questioned: which is the clinical and epidemiological profile of surgical patients who developed ocular dryness and nursing diagnosis Risk of dry eye, in the postoperative period, hospitalized in the Intensive Care Unit? Justification to work with this theme due to being a phenomenon of global interest, according to the first global report on vision of the World Health Organization, due to referring to a object in the care of nursing and the need to investigate the clinical-epidemiological profile of the surgical population, in the period of postoperative, in Intensive Care Unit.

In such a way, it was aimed to determine the clinical and epidemiological profile of surgical patients with ocular dryness and with the nursing diagnosis Risk of dry eye, in the postoperative period.

Methods

Cross-sectional study, performed at university hospital, located in northeastern Brazil, developed in line with the initiative Strengthening the Reporting of Observational Studies in Epidemiology (STROBE), which contains list of 22 items with useful recommendations for planning epidemiological observational studies[7].

The basis for the preparation of this study came

from a larger research[4], held since January to July 2016, which identified clinical predictors and prevalence of ocular dryness and nursing diagnosis Risk of dry eye, in adult patients , admitted to Intensive Care Unit. In this larger study, the diagnostic inference of ocular dryness and Risk of dry eye was performed by diagnostic nurses, guided by an instrument composed of sociodemographic and clinical variables, risk factors described in NANDA-I and the Schirmer I test. According to the standardized and adapted parameters of Dry Eye Workshop II, ocular dryness was considered when there was an insufficient volume test (Schirmer I test <10mm), associated with one or more clinical signs (ocular hyperemia and/or mucoid secretion)[2,4]. In regards to the inference of nursing diagnosis Risk of dry eye, this was standardized by patterns recognizing[4].

For composition of the sample, data were collected for the intraoperative, obtained between August and October 2016, the medical records of the patients participating in the previous study cited, taken seconds after contact and agreement of the Service of Medical Archive and hospital Statistical. Were included, in the study, the medical records of adult patients, aged ≥ 18 years old, in post-operative, which showed ocular dryness and/or nursing diagnosis Risk of dry eye, admitted to the Intensive Care Unit. Patients whose operative record was not found in the hospital archive were excluded.

It was considered, initially, a population of 925 patients, according to the archive files and, after a pilot study with 30 patients, sample calculation for studies of finite population were enacted, obtaining final sample of the research as cited above of 206 patients[4]. Of these, 104 were postoperative and only 82 were included in the final sample of the present study, as they met the eligibility criteria.

For data collection, we used an instrument containing variables from the operative period; namely: epidemiological data (age, sex and place of residence); and clinical data (surgical specialty, type of anesthetic used and route of administration, type of myorelaxant, time of induction and maintenance anesthetic, time of surgical procedure and surgical positioning of the patient).

The collected data were tabulated in the *Statistical Package for Social Science program,* version 22.0. The tabulation was performed by one of the researchers and, after its completion, a second researcher proceeded to a new conference. For descriptive analysis, frequencies, measures of the distribution center and their variability were used. To verify the normality of the data, the Shapiro-Wilk test was applied.

This study obtained a favorable opinion of the Ethics in Research Committee of the proposing institution, as nº 918,510/2014 and Certificate Presentation of Findings Ethics nº 36079814,6,0000,5537.

Results

The sample end, consisting of 82 patients, found that 41 (50.0%) participants displayed ocular dryness and 41 (50.0%) the nursing diagnosis Risk of dry eye, in the postoperative. As to gender, there were predominantly female both for patients with ocular dryness and to patients with nursing diagnosis Risk of dry eye, with a total of 25 (61.0%) patients in the first group and 23 (56.1%) for the second. Most of the study participants had their place of origin in the countryside of Rio Grande do Norte, of which 24 (58.5%) had ocular dryness and 24 (58.5%) had a risk diagnosis. With regard to patients from the capital, Rio Grande do Norte, 17 (41.5) were part of the group with the ocular dryness and 17 (41.5) with the diagnosis of risk.

Among the procedures, the patients were mostly submitted to elective surgeries. Of these, 27 (65.9%) were part of the group of patients with ocular dryness and 28 (68.3%) of the group with the nursing diagnosis. In regard to patients undergoing emergency surgery, 14 (34.1%) demonstrated ocular dryness and 13 (31.7%) the risk diagnosis. Regarding surgical motif, predominated cardiovasculars, both in patients with ocular dryness, 19 (46.3%), as in pa-

tients with nursing diagnosis, 21 (51.2%).

For patients with ocular dryness, the average age was 57.7 years standard deviation (SD) ±13.1, and for patients with nursing diagnosis, average age was 59.6 years (SD ± 19.4). The hospital stay obtained average stay of 11 days for patients with ocular dryness and 25.5 days for patients with the nursing diagnosis, since the time of surgical procedure, an average. of 105 minutes for patients with ocular dryness and 67.5 minutes for those with a risk diagnosis (Table 1).The predominant type of anesthesia was the general intravenous, both for patients with ocular dryness as for patients with the nursing diagnosis; 17 (41.5%) of them belonged to the first group and 19 (46.3%) to the second. The most commonly used types of drugs in each of the types of anesthesia are described in Table 2.

Table 1 - Characterization of patients surgical with ocular dryness and with the nursing diagnosis Risk of dry eye, in the postoperative period. Natal, RN, Brazil, 2019. (n=82)

Variables	Average	Standard deviation	Median	Minimum	Maximum	p-value *
Ocular dryness						
Age	57.7	13.1	58.0	21.0	82.0	0.367
Length of stay (days)	21.3	21.7	11.0	3.0	98.0	<0.001
Induction and maintenance (minutes)	197.2	220.6	125.0	20.0	1119.0	<0.001
Surgical procedure (minutes)	138.2	137.3	105.0	15.0	545.0	<0.001
Nursing diagnostic Risk of dry eye						
Age	59.6	14.9	61.0	28.0	84.0	0.544
Length of stay (days)	27.7	21.9	25.5	4.0	95.0	<0.001
Induction and maintenance (minutes)	207.9	185.5	160.0	15.0	615.0	<0.001
Surgical procedure (minutes)	149.0	157.2	67.5	3.0	504.0	<0.001

*Shapiro-Wilk test

Table 2 - Characterization of the types of anesthesia and drugs used in surgical patients with ocular dryness and with the nursing diagnosis Risk of dry eye, in postoperative. Natal, RN, Brazil, 2019. (n=82)

Variables	Eye dryness	Nursing diagnosis Risk of dry eye
	n (%)	n (%)
Types of Anesthesias		
Intravenous General	17 (41.5)	19 (46.3)
General intravenous + inhalation	16 (39.0)	19 (46.3)
Place	5 (12.2)	2 (4.9)
Spinal	2 (4.9)	-
Epidural	1 (2.4)	1 (2.4)
Drugs Used		
Intravenous General		
Propofol	16 (48.5)	24 (63.2)
Midazolam	12 (36.4)	11 (28.9)
Etomidate	5 (15.1)	2 (5.3)
Ketamine	-	1 (2.6)
General intravenous + inhalation		
Sevoflurane	16 (100.0)	19 (100.0)
Place		
Lidocaine	4 (80.0)	2 (100.0)
Tetracaine	1 (20.0)	-
Spinal		
Bipuvacaine	2 (100.0)	-
Epidural		
Ropivacaine	1 (100.0)	1 (100.0)

Regarding the use of myorelaxants, it was used by 17 (41.5%) of the patients with ocular dryness and by 21 (51.2%) of the patients with the nursing diagnosis Risk of dry eye. About types of muscle relaxants, on patients with ocular dryness, stood out the use of cisatracurium in 24 (82.8%) of them and 20 (80.0%) of patients with the risk diagnosis, followed by pancuronium present in one (3.4%) patient with ocular dryness and in four (16.0%) with nursing risk diagnosis. The succinylcholine also been used in only one (3.4%) patient with ocular dryness, and one (4.0%) with risk diagnosis. Stands that the rocuronium was used in two (6.9%) patients with ocular dryness and the atracurium in only one (3.4%) of them. No patient with the nursing diagnosis Risk of dry eye made use of these last two drugs.

Regarding the surgical positioning intraoperatively, excelled in the supine position 33 (91.7%) of patients with ocular dryness and 31 (91.2%) of patients with nursing diagnosis Risk of dry eye (Table 3).

Table 3 - Characterization of types of surgical positioning in patients with ocular dryness and nursing diagnosis Risk of dry eye, in the postoperative period. Natal, RN, Brazil, 2019. (n=82)

Variables	Eye dryness	Nursing diagnosis Risk of dry eye
	n (%)	n (%)
Patient Positioning *		
Supine	33 (91.7)	31 (91.2)
Prone position	-	1 (2.9)
Lateral position	3 (8.3)	-
Lithotomic or gynecological	-	1 (2.9)

*Missing data

Discussion

As limitation, the study showed the absence of some of the files of the intraoperative of the participants and incomplete information's about the type of positioning of the patients that may have impaired, in some form, the calculated frequencies. Nevertheless, the study provided relevant data on clinical and epidemiological characteristics, which may be deepened by future research.

This study may assist nursing professionals, especially nurses working in clinical care practice, in order to direct health actions, in view of minimizing and preventing the occurrence of the phenomenon in question, in the surgical environment, as well as contributing to future studies that may determine predictors factors, contributing to the occurrence of both diagnostic and Risk of dry eye in the postoperative period.

Checking the clinical and epidemiological factors of a population is essential for planning and decision making, in lieu of a health problem. Researches are needed that seek to investigate certain area, for one period of time to meet the problems posed by the population. Thus, one can understand the mechanisms causing health problems in this area and establish measures promoting health, prevention and treatment of diseases[8].

Thus, since eye dryness is a human response that is a predictor of tear film dysfunctions, nurses can identify, evaluate and plan health actions, focusing on preventing the onset of this phenomenon, especially in environments where this human response can be avoided, example postoperative in Intensive Care Unit[4].

A study of characterization of critical patients who developed ocular dryness concluded, after monitoring of patients, this is a common condition in Intensive Care Unit[3]. In this study, the population was comprised of hospitalized surgical patients in the Intensive Care Unit, which were exposed previously to predictor factors for the ocular dryness and for nursing diagnosis Risk of dry eye, in the cirurgical center, and continued being exposed to these risk factors in the environment of the Intensive Care Unit.

This research showed population predominantly female and middle-aged, corroborating with the taxonomy NANDA-I, which has among populations at risk for the nursing diagnosis Risk of dry eye, fe-

males and senior aging[5].

Concerning this, one research on hormone therapy in women aged between 35 and 59 years, with dysfunction in the meibomian glands, reports that this condition happens by hormonal imbalance, consequently, favors the appearance of ocular dryness in this population[9]. The dysfunction of the mibia gland decreases lipid secretion, which is responsible for ocular protection and lubrication[10].

Recent research evidences that postoperative can be environment conducive to the development of ocular dryness, once the surgical procedure contributes to the decrease in tear production, from waste liquids, and utilizing general anesthetics in some surgical modalities whose function is central nervous system depression. The latter, able to inhibit or diminish some reflexes, such as blinking[11].

The mode of surgery prevalent in both groups of patients evaluated was elective especially for cardiovascular surgical specialty. In this regard, one study of concurrent cohort shows that patients admitted to Intensive Care Unit with vascular problems are at increased risk for the development of ocular alteration, however, justifies that this phenomenon may be due to the gravity of the patients, which were in comatose, sedated and in mechanical ventilation[6].

With regard to the time of surgery, one research enunciates that maintaining of the patient for long periods (over five hours), prone, during surgery, is responsible for increasing the intraocular pressure, thickness of the choroid and the diameter of the optic nerve[12] . However, the increased time of exposure to the environmental factors of the operating room itself, in combination with the use of drugs that favor the reduction of tear secretion and eye movements, and also the incomplete closure of the eyes, may favor ocular dryness, corroborating with the finding of the present research. It is believed that because most of elective surgeries are cardiovascular procedures, there is a tendency to remain in the patient for both long time and in the same position.

The drugs presented by this study are anesthetics (general intravenous and inhalational, spinal, epidural and local) and myorelaxants. There is a need for more research to portray the relationship of anesthetics in the development of ocular dryness and nursing diagnosis Risk of dry eye, as patients with eyelid reflexes decreased, due to the use of drugs anesthetic or using intubation and invasive mechanical ventilation, tends to develop these human responses[3].

As for anesthetics , the findings of this research to both groups is consistent with studies that showed that the propofol is commonly used in the surgical center , due to the properties and anesthetic security provided for this drug[13]. In addition, a study of eye saccadic movements has shown that propofol and midazolam are responsible for altering these movements[14], a fact that may contribute to the appearance of eye problems, since the movement of the eyeball allows the tear to be spread in the eye and can lead to an incomplete blink, possibly causing deficiency in the lipid layer of the tear film, which favors evaporation and consequent ocular dryness[15].

The sevoflurane was the only inhaled general anesthetic cited in operative files, consisting in a safe drug, reliable, with low side effects, easy to administer and able to keep the hemodynamically stable patient[16]. On this, one study found that the pulse perfusion value increases after induction of anesthesia with sevoflurane and decreases during recovery from anesthesia, which tends to eye opening[11], and can therefore increase the risk of changes in ocular surface.

For both groups of patients, the significant frequency of cisatracurium as a myorelaxant is in accordance with international scientific research, which identified the use of this muscle relaxant in combination with general anesthesia, which also has properties that prevent ocular movement and eyelid closing[17], which can characterize them as a factor that favors ocular dryness .

In contrast, a study on the effect of cisatracurium in adults and the elderly comments that the use of this relaxant does not promote a considered increase in histamine, a chemical mediator involved in inflam-

mation[17]. This feature can be considered a protective factor for development to the ocular dryness, since inflammatory factors in the eye regions are triggers of ocular disorders[15].

The positioning most prevalent in this study was the supine position, for the two groups. On this, other authors reported that the intraocular pressure increases in the lateral position, but returns to the baseline value when the patient is placed in supine[18]. However, and in another observational prospective, it was found that positioning the patient's head below thirty degrees in the lateral position increases the pressure intraocular of the dependent eye[11], which can favor the emergence of ocular disorders. The higher frequency of patients in supine also results from the majority of the procedures performed being cardiovascular.

Conclusion

Both groups of patients evaluated were made predominantly by women of middle age, undergoing cardiovascular elective surgery, in which remained largely in the supine position, made use of general intravenous anesthesia, propofol type, during the perioperative period, and used, mainly, the muscle relaxant cisatracurium. However, the duration of the surgical procedure was longer in patients with ocular dryness, when compared to those with the nursing diagnosis Risk of dry eye.

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Collaborations

Medeiros RAC contributed in the conception, analysis and interpretation of the data and writing of the manuscript. Araújo JNM, Soares RPS and Silva AB collaborated with writing, critical review of intellectual content and approval of the final version to be published. Ferreira Júnior MA cooperated with critical review of intellectual content. Vitor AF assisted in the conception, analysis and interpretation of data and approval of the final version to be published.

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