



The Differences in Conjunctival Impression Cytology Profile, Interleukin-6 Levels in Tears, and Stages of Dry Eye Between Anophthalmic Socket and Contralateral Healthy Eye)

Nur Aulia^{1*}, Suliati Paduppai¹, Halimah Pagarra¹, Junaedi Sirajuddin¹, Rina Masadah², Rusdina Bte Ladju²

¹Department of Ophthalmology, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia.

²Department of Pathology Anatomy, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia.

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Corresponding Author:

Nur Aulia

aulia27ime@gmail.com

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Abstract: Dry eye is one of the symptoms that can be suffered by anophthalmic socket eye, which is related to changes in the conjunctival epithelium and inflammatory processes in the anophthalmic socket eye. This study aims to determine differences in the degree of conjunctival impression cytology, tear pro-inflammatory cytokine interleukin-6 (IL-6), and degree of a dry eye between the anophthalmic socket eye and the contralateral healthy eye. This research is a cross-sectional study. Seventeen patients with anophthalmic socket eyes underwent conjunctival impression cytology examination, assessed tear levels of the pro-inflammatory cytokine IL-6, Schirmer test examination, and filled in the Dry Eye Questioner-5 (DEQ-5). The examination was performed simultaneously on the anophthalmic socket eye and the contralateral healthy eye. This study showed a significant difference in conjunctival impression cytology ($p=0.004$) and a significant difference in tear pro-inflammatory cytokine IL-6 levels ($p=0.014$). There was no significant difference ($p=0.319$) in the results of the Schirmer 1 test, but there was a significant difference in the Schirmer 2 test ($p=0.0047$). There is a significant difference in the value of the DEQ-5 questionnaire ($p=0.003$). There were significant differences in conjunctival impression cytology, tear pro-inflammatory cytokine IL-6, and degree of the dry eye between the anophthalmic socket eye and the contralateral healthy eye. Therefore, it is necessary to administer artificial tear drops to each patient with anophthalmic socket as a preventive measure for dry eye in the anophthalmic socket.

Keywords: Anophthalmia; Cross-sectional studies; Dry eye; Interleukin-6

Introduction

Anophthalmia socket is the absence of an eyeball or the contents of the orbital cavity, which can occur congenitally or secondary to a previous disease such as glaucoma, diabetic retinopathy, intraocular tumor, or the result of ocular trauma. Anophthalmia socket occurs due to the removal of the eyeball (enucleation) or the contents of the eyeball (evisceration) (Korn, 2020; Salmon, 2020). More than 50% of ophthalmic socket patients wearing ocular prostheses develop dry eyes. Compared with the contralateral healthy eye, as many

as 63% suffer subjective dry eye symptoms in an ophthalmic socket eye (Bohman et al., 2025). The dry eye symptom exact cause is unknown, even without tear film deficiency and clinical blepharitis (Putnam, 2016). Several studies have been conducted to explain the causes of mucoid discharge in the anophthalmia socket. To date, mucoid discharge is the most common and bothersome symptom associated with an ophthalmic socket. Another critical reason for discomfort in the anophthalmic socket is dry eye, also known as dry anophthalmic socket syndrome (DASS) (Rokohl et al., 2020).

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Dry eye symptoms in patients with anophthalmic sockets have been described in several studies where there is a decrease in tear production and the tear reflex, especially in patients with dry eye symptoms (Fitriatsani et al., 2023; Razaan et al., 2023; Salsabila et al., 2023). Other reasons for dry eye symptoms in anophthalmic socket patients include dysfunction of the meibomian glands, loss of goblet cells, eyelid margin abnormalities, lagophthalmos, decreased tear meniscus, conjunctivitis, and eyelid laxity. Thus the most recent study established diagnostic criteria for DASS, namely the presence of subjective symptoms in the anophthalmic socket as evaluated by a standard measuring questionnaire for the evaluation of the dry eye and at least one of the following four clinical abnormalities: significant conjunctival inflammation resulting in conjunctival staining or decreased tear meniscus height or presence of anterior or posterior blepharitis. Increased tear evaporation can contribute to increased tear osmolarity. Increased tear osmolarity causes the activity of the inflammatory pathway Mitogen Activated Protein (MAP) kinase, Nuclear Factor-KappaB (NFkB), the release of inflammatory cytokines, and MMP-9. The release of these cytokines stimulates inflammatory cells on the ocular surface. This series of inflammatory cytokine releases cause the death of epithelial cells on the ocular surface, including goblet cells. A decrease in goblet cells causes a decrease in mucin production, which causes a reduction in the stability of the tears (Periman et al., 2020; A. Rokohl et al., 2020).

The changes in the conjunctival impression cytology profile and proinflammatory cytokines play a particular role in the process of dry eye in anophthalmic socket. It's just that, based on the authors' knowledge, until now, no one has assessed the levels of proinflammatory cytokine IL-6, the cytological profile of conjunctival impressions, and the degree of dry eye in anophthalmic socket eye and compared with the contralateral healthy eye. This study aimed to determine the difference in the degree of conjunctival impression cytology, levels of tear proinflammatory cytokine IL-6, and degree of a dry eye between the anophthalmic socket and the contralateral healthy eye.

Method

This cross-sectional study was conducted at Wahidin Sudirohusodo Hospital, Makassar, Indonesia. The study population was individuals who came to the outpatient department with an anophthalmic socket diagnosis carried out at least 6 months after evisceration or enucleation. This study was approved by the Biomedical Research Ethics Commission on Humans, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia (number: 759/UN4.6.4.5.31/PP36/2021).

The sampling technique used in this study was a non-probability sampling approach using purposive sampling of 16 samples. The inclusion criteria were as follows: 1) patient with anophthalmic socket which had enucleation or evisceration for at least 6 months; 2) patient with anophthalmic socket which has not received any topical antibiotic and anti-inflammatory treatment on the anophthalmic socket for at least 3 months; 3) who voluntarily agreed and signed the informed consent form. The exclusion criteria were as follows: 1) patients with a history of surgery or laser intervention, using contact lenses on the contralateral healthy eye, or using topical drugs that cause dry eye (for example, topical glaucoma drugs before evisceration or enucleation); 2) patients with a history of facial palsy and systemic diseases that cause dryness eye (rheumatoid arthritis, diabetes mellitus, thyroid disease, Sjogren's syndrome, systemic lupus erythematosus); 3) patients with a history of temporary chemotherapy or radiotherapy; 4) patients with lid abnormalities including ptosis, lid retraction, lagophthalmos, history of trauma, lacerations, history of hordeolum, chalazion, conjunctivitis, hyperlacrimation due to obstruction of the nasolacrimal duct.

Dry Eye in the Anophthalmic Socket

In this study, the DEQ-5 questionnaire was used as a subjective assessment of the degree of dry eye because the DEQ-5 questionnaire did not have the visual assessment points found in other dry eye questionnaires. Before filling out the questionnaire, each subject received an explanation on how to fill out the questionnaire first. The questionnaire assessment was carried out twice. The first was to assess the subjective symptoms in the contralateral healthy eye, followed by filling out a new questionnaire for the anophthalmic socket eye. The objective criteria were as follows: DEQ-5 score ≥ 5 and at least one of the following four clinical abnormalities (significant conjunctival inflammation, conjunctival staining, decreased tear meniscus height, and presence of anterior or posterior blepharitis) (A. C. Rokohl et al., 2023).

Subjective Symptoms of Dry Eye

Dry eye symptoms felt by the patient directly were evaluated using the DEQ-5 questionnaire. The objective criteria: Normal (0-6), Mild (6-12), and Severe (≥ 12) (Caffery et al., 2019; Chalmers et al., 2010).

Schirmer's Test 1

Schirmer test 1 to assess reflex secretion due to a stimulus to the conjunctiva without the use of topical anesthetics. Measurements were carried out for 5 minutes. The objective criteria were classified as normal if the filter paper wetting length was >15 mm. The

grading of the dry eye is based on the interpretation of the Schirmer test: grade 1 (10 – 15 mm), grade 2 (5 – 10 mm), grade 3 (< 5 mm), and grade 4 (< 2 mm) (Peters & Colby, 2008; Priani et al., 2023).

Schirmer's Test 2

The Schirmer 2 test measures accessory lacrimal gland (basal secretion) function and is performed with topical anesthesia. The objective criterion is normal if the filter paper wetting length is >15 mm. The degrees of the dry eye based on the interpretation of the Schirmer test were grade 1 (10 – 15 mm), grade 2 (5 – 10 mm), grade 3 (< 5 mm), and grade 4 (< 2 mm) (Peters & Colby, 2008; Priani et al., 2023).

Pro-inflammatory Cytokine IL-6

The pro-inflammatory cytokine IL-6 from the tears of participants was measured using the ELISA kit from the Bioassay Technology Laboratory (Shanghai, China) used with catalog no. E0090Hu according to the factory protocol at the Hasanuddin University Medical Research Center laboratory. IL-6 pro-inflammatory cytokine values in ng/mL units. The tool used is the Biomerieux Reader 270 (Marcy-l'Etoile, France), with a wavelength of 450 nm. Because there is no defined standard value for pro-inflammatory cytokine IL-6 in tears, the standard value for cut-off is determined by statistical calculations.

Conjunctival Impression Cytology

Diagnostic techniques of conjunctival biopsies or smears are made from swabs taken with a blunt spatula to measure goblet cell density expressed in the number of goblet cells in the visual field, morphological changes, and the ratio of the nucleus and cytoplasm of conjunctival epithelial cells (S. Kumar et al., 2013). Samples were fixed with 96% alcohol solution and Papanicolaou staining. Each specimen was examined under a microscope with 10 x and 40x high power field (HPF). Classification of Ocular Surface Cytology According to Tseng (Haller-Schober et al., 2006; Simsek et al., 2019). Grade 0 = No keratin, a moderate number of goblet cells, uniform epithelial cells with blue:green cytoplasm, and 1:1 cytoplasmic ratio; Grade 1 = No keratin, decreased goblet cell density, slight enlargement of the epithelium with blue-green cytoplasm, and a cytoplasmic ratio of 1:2 – 1:3; Grade 2 = No keratin, total loss of goblet cells, flattened epithelial cells, enlarged and slightly pinkish cytoplasm, and 1:4 cytoplasmic ratio; Grade 3 = Mild keratinization, presence of keratin filaments, no goblet cell epithelium, metachromatic changes in the cytoplasm of the squamous epithelial cells to pink, and a cytoplasmic ratio of 1:6; Grade 4 = Moderate keratinization, dense keratin filaments, no goblet cells, large epithelial cells, squamous and

metachromatic, and 1:8 cytoplasmic ratio; and Grade 5 = Keratinization at an advanced stage, dense keratin filaments, pyknotic nucleus, no goblet cells, keratinized epithelial cells with shriveled cytoplasm.

Data analysis

All data analyses were performed using the SPSS version 16.0 (IBM Corp.; Armonk, NY, USA). The statistical test used was the Mann-Whitney test (data not normally distributed) or the unpaired t-test (data normally distributed).

Result and Discussion

Characteristics of Participant

Table 1 shows that of the 17 participants, the most common anophthalmic socket cases were in the adult age of 13 subjects (76.5%). The comparison of the male and female sexes was almost the same, where 8 subjects (47.1%) were male and 9 female subjects (52.9%). Of the 17 subjects, the majority of 14 subjects (82.4%) underwent evisceration.

Table 1. Characteristics of Participant

Characteristics	Anophthalmic socket cases n (%)
Age	
Children and teenagers (< 19 years)	4 (23.5)
Adults (≥ 19 years)	13 (76.5)
Sex	
Male	8 (47.1)
Female	9 (52.9)
Surgery type	
Evisceration	14 (82.4)
Enucleation	3 (17.6)
Length of using ocular prostheses	
< 1 year	5 (29.4)
> 1 years	12 (70.6)
History of socket repair surgery	
Yes	4 (23.5)
No	11 (64.7)

Difference between the Cytology Grade in Normal Eyes and Anophthalmic Sockets

Table 2 shows a significant difference between the cytology grade in normal eyes and anophthalmic sockets. In this study, a more significant percentage of anophthalmic socket eyes with a more severe cytology grade was stage 2 and 4, at 88.9% and 100%, respectively. In comparison, normal eyes had a more significant percentage at a lower grade of cytology (stage 0 and stage 1 at 87.5% and 60.0%, respectively).

In table 3, the mean IL-6 value was higher in anophthalmic socket eye at 94.44 ± 29.45 pg/ml

compared to healthy eyes at 68.52 ± 30.47 pg/ml ($p < 0.05$). In Table 4, there was no significant difference in Schirmer 1 Dry Eye Degree ($p > 0.05$), but there was a significant difference in Schirmer 2 ($P < 0.05$) in normal eyes with anophthalmia. In Schirmer 1, the percentage of degree 2 was more significant than normal eyes at 66.7%, but it was not statistically significant. In Schirmer 2, it was found that the percentage of degree 2 was more

significant in anophthalmia, at 69.2%, which was statistically significant, even though in normal eyes, there was 1 subject with degree 3.

Table 5 shows a significant difference in DEQ5 values in normal and anophthalmic socket eyes ($p < 0.05$). The highest percentage in mild and severe degrees was found at 75.6% and 80.0%, respectively, in the anophthalmic socket eye.

Table 2. Differences in Grade of Conjunctival Impression Cytology between Anophthmia Socket Eyes and Contralateral Healthy Eyes

Variable	Grade	Eyes		p-value*	
		Contralateral	Anophthmia socket		
Cytology	0	n (%)	7 (87.5)	1 (12.5%)	0.004
	1	n (%)	9 (60.0)	6 (40.0)	
	2	n (%)	1 (11.1)	8 (88.9)	
	3	n (%)	0 (0.0)	0 (0.0)	
	4	n (%)	0 (0.0)	2 (100.0)	
	5	n (%)	0 (0.0)	0 (0.0)	

*Fisher's exact test

Table 3. Differences in Tear Proinflammatory Cytokine IL-6 Levels Between Anophthalmic Socket Eye and Contralateral Healthy Eye

Variable	Eyes		p-value*
	Contralateral (Mean \pm SD)	Anophthmia socket (Mean \pm SD)	
IL-6 levels (pg/ml)	68.52 \pm 30.47	94.44 \pm 29.45	0.014

*Mann-Whitney test

Table 4. Differences in Degrees of Dry Eye based on Schirmer Tests 1 and 2 Between Anophthalmic Socket Eye and Contralateral Healthy Eye

Variable	Grade	Eyes		p-value*	
		Contralateral	Contralateral		
Schirmer 1	Normal	n (%)	9 (64.3)	5 (35.7)	0.319
	1	n (%)	5 (45.5)	6 (54.5)	
	2	n (%)	3 (33.3)	6 (66.7)	
	3	n (%)	0 (0.0)	0 (0.0)	
	4	n (%)	0 (0.0)	0 (0.0)	
Schirmer 2	Normal	n (%)	8 (80.0)	2 (20.0)	0.047
	1	n (%)	4 (40.0)	6 (60.0)	
	2	n (%)	4 (30.8)	9 (69.2)	
	3	n (%)	1 (100.0)	0 (0.0)	
	4	n (%)	0 (0.0)	0 (0.0)	

*Chi-square test, **Fisher's exact test

Table 5. Differences in Degrees of Dry Eye based on the DEQ-5 Questionnaire Between Anophthalmic Socket Eye and Contralateral Healthy Eye.

DEQ-5 category		Eyes		p-value*
		Contralateral	Contralateral	
Normal	n (%)	13 (81.3)	3 (18.8)	0.003
Mild	n (%)	2 (25.0)	6 (75.0)	
Severe	n (%)	2 (20.0)	8 (80.0)	

*Chi-Square test

In this study, there was a change in conjunctival epithelial cells in anophthalmic socket eye. Almost all subjects with anophthalmic socket eyes experienced conjunctival epithelial changes (Classification Tseng

grade 1-4). There was a significant difference ($p < 0.05$) in the degree of conjunctival implantation cytology between the anophthalmic socket eye and the contralateral healthy eye. In the anophthalmic socket,

there was an increased nuclear:cytoplasmic ratio, decreased number of goblet cells, spaced epithelial cells with polygonal cell shapes, presence of cells with two nuclei, and a snake-like chromatin appearance (figure 1).

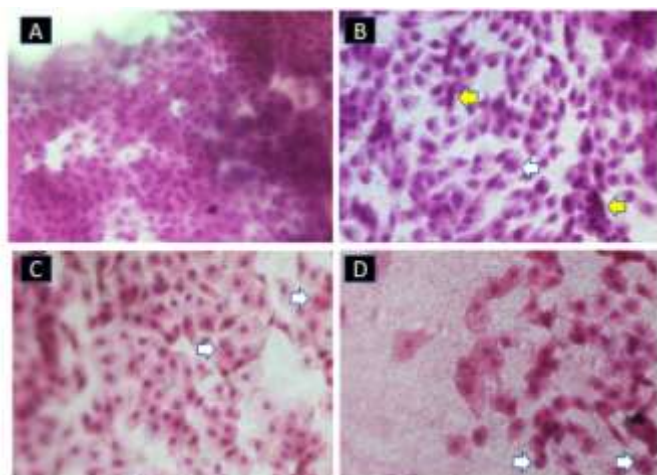


Figure 1. Conjunctival impression cytology was obtained in this study. Conjunctival impression cytology of an anophthalmic socket eye. A. Stage 0: 1:1 nuclear:cytoplasmic ratio, appears a large number of goblet cells; B. Stage 1: 1:2 nuclear:cytoplasmic ratio, with a decreasing number of goblet cells. Snake-like chromatin (yellow arrows) and cells with two nuclei (white arrows) are shown; C. Stage 2: polygonal shape, pink cytoplasm with a nucleus:cytoplasm ratio of 1:4; D. Stage 4. Cells with two nuclei (white arrows) and large epithelial cells with pyknotic nuclei are shown. (Staining using Papanicolaou, microscope magnification x40)

Discussion

In this study, no cytological features of lipid cells or oral mucosa cells were found in all samples on ocular surface cytology classification examination. Snake-like chromatin is an unusual form of chromatin in nuclear cells, and this is related to several pathological conditions, such as inflammation due to dry eyes. Therefore, decreased density of goblet cells and conjunctival epithelial cells and changes in the morphology of conjunctival epithelial cells are signs of a chronic inflammatory process in the conjunctiva (Kim et al., 2008; Lopin et al., 2009).

In line with the study conducted by Kim et al. evaluated the cytological picture of conjunctival impression in anophthalmic socket patients using ocular prostheses, where it was found that squamous metaplasia occurred with a decrease in the number of goblet cells and the ratio of cytoplasmic nuclei to epithelial cells which increased significantly compared to control eyes and there was no significant relationship with the time of wearing prostheses and wearing eye drops (Kim et al., 2008).

Shriver et al. (2020) and Johnson (2020) also described changes in conjunctival epithelial cells in the

anophthalmic socket eye, where there was a decrease in goblet cell density and a greater nuclear to cytoplasmic ratio. According to Rokohl et al. (2020), the release of proinflammatory cytokines causes the death of epithelial cells, including goblet cells in the conjunctiva. This result is in line with our study in which patients with changes in conjunctival impression cytology tended to have increased tear proinflammatory cytokine IL-6 levels. A decrease in the density of conjunctival goblet cells causes a decrease in mucin production, disrupting tear homeostasis, which can cause dry eye. The level of conjunctival hydration is also an exogenous factor that can affect the density and distribution of normal conjunctival goblet cells (Peters & Colby, 2008). A decrease in conjunctival goblet cells was also found in several other diseases. A study by Shrestha et al (Shrestha et al., 2011) regarding the cytological picture of conjunctival impression in dry eye syndrome found that the number of goblet cells decreased significantly in dry eye patients compared to normal eyes.

There were 9 participants (60.0%) with contralateral healthy eyes who experienced grade 1 conjunctival epithelial changes. These changes were accompanied by increased levels of conjunctival pro-inflammatory cytokines and decreased Schirmer test values. Changes in the conjunctival epithelium in the healthy conjunctival eye are thought to be due to the healthy eye also experiencing dry eye (low Schirmer test value), which causes an inflammatory process resulting in changes in the conjunctival epithelium. This result is similar to a study by Kumar et al. (2014), where 28% of the controls also had abnormal conjunctival implant cytology. However, this study did not explain the cause of the impression cytology changes in the conjunctiva of the contralateral healthy eye.

Until now, no one has ever assessed IL-6 in tears in the anophthalmic socket eye compared to the contralateral healthy eye. This study showed significantly increased IL-6 levels in tears of anophthalmic socket eye ($p < 0.05$). A similar finding was found by Ko et al. (2018), where there was an increase in the levels of the pro-inflammatory cytokine IL-6 in tears in anophthalmic socket eyes. In this study, there was an increase in IL-6 levels in tears, followed by a decrease in the number of conjunctival goblet cells in anophthalmic socket eye. IL-6 levels in tears also increased in subjects with a history of socket repair surgery. In patients who undergo socket repair surgery, there will be changes in the structure of the conjunctiva, thereby increasing the inflammatory process in the conjunctiva. In addition, during socket repair, the conjunctival tissue is replaced with epidermal skin tissue, which does not have goblet cells, resulting in a decrease in mucin secretion which results in impaired tear stability and increased

inflammation in the conjunctiva. However, in this study, no correlation test was carried out between them.

According to a study by Periman et al. (2020), increased IL-6 levels in tears are related to the incidence of dry eye, the release of MMPs, decreased tear production, and cell death. In this study, there was an increase in IL-6 levels in tears of the anophthalmic socket eye compared to the contralateral healthy eye because the anophthalmic socket eye has a conjunctival structure that has changed due to the operation process, history of socket repair surgery, friction between the conjunctiva and the ocular prosthesis resulting in inflammation. Chronic inflammation causes apoptosis of epithelial cells and conjunctival goblet cells resulting in decreased tear production and instability (Ko et al., 2018; Periman et al., 2020; Perry, 2008).

In our study, the mean IL-6 level in tears was 94.44 ± 29.45 pg/ml in the anophthalmic socket eye and 68.52 ± 30.47 pg/ml in the contralateral healthy eye. This value is low compared to several previous studies. In a study conducted by VanDerMeid et al. (2012), the average value of IL-6 levels in tears was 82.5 ± 3.5 pg/ml, and in a study conducted by Gupta et al. (2018), the average value of IL-6 levels in tears was 86.71 ± 88.45 pg/ml.

Several examinations assess dry eye, including the Schirmer examination, TBUT, and tear meniscus height. In this study, only Schirmer's test was carried out because in patients with anophthalmic socket, there was no cornea, so they could not assess TBUT, and it was difficult to evaluate the tear meniscus height because the shape of the ocular surface to the palpebral margin was not formed and difficult to evaluate.

In our study, there was no significant difference in the degree of dry eye with the Schirmer 1 test ($p > 0.05$), but there was a significant difference in the Schirmer 2 test ($p < 0.05$). There are more normal results in contralateral healthy eyes in the Schirmer test 1 and Schirmer test 2 compared to anophthalmic socket eyes with normal examination results. Whereas dry eye degrees 1 and 2 are more common in anophthalmic socket eyes. A significant difference in the Schirmer 2 test may indicate that the anophthalmic socket eye has decreased basal tear secretion. According to Beckman et al. (2016), because the Schirmer 2 test uses topical anesthesia, it can assess tear basal secretion (measuring accessory lacrimal gland function). Meenakshi et al. (2017) explained that the Schirmer 2 test could detect tear basal secretion better than the Schirmer 1 test. The absence of a significant difference in the Schirmer 1 test could be because the examination was carried out without topical anesthetics so that tear secretion can be stimulated by factors other factors, including the Schirmer paper's contact with the ocular surface, which can cause false negative results. Beckman also explained where false-positive or false-negative results could occur

with the Schirmer test. Low results can be found in normal people, and normal test results can be seen in dry eyes, especially those secondary to mucin deficiency (Beckman et al., 2016).

The result was in line with a study by Rokohl et al. (2020), where more than 50% of anophthalmic socket patients had dry eye symptoms compared to the contralateral healthy eye, with a significantly higher Schirmer 1 test score. Rokohl et al. also compared the Schirmer 1 and 2 tests in post-enucleation and evisceration anophthalmic socket eyes, where there was no significant difference between them. According to Marcelo et al. (2012), decreased tear production in anophthalmic socket is caused by disruption of the normal anatomical structure of the cornea and conjunctiva due to enucleation or evisceration and disorder of the aqueous and mucin components of tears. A study conducted by Johnson et al. (2020) also showed a decrease in tear production (low Schirmer test results) that occurred in >75% of the anophthalmic socket and significant meibomian gland dysfunction in the anophthalmic socket.

The decrease in tear production found in the anophthalmic socket eye can indicate that dry eye occurs in the anophthalmic socket eye and can be considered for artificial tear therapy as an additional therapy in treating dry eye in anophthalmic socket. As described in the study by Kashkouli et al., Schirmer's test and meniscus tears were lower in anophthalmic socket eyes, and a quarter of patients required lubrication as adjunctive therapy (Kashkouli et al., 2016).

There was a significant difference in the degree of the dry eye based on the DEQ-5 value between the anophthalmic socket eye and the contralateral healthy eye. 80% of subjects with anophthalmic socket suffer from severe degrees of dry eye, while 81.3% of subjects with contralateral healthy eyes do not have subjective symptoms of dry eye. Assessment of the degree of dry eye using the DEQ-5 questionnaire is very subjective; therefore, it is necessary to examine the degree of dry eye objectively, for example, by examining the Schirmer test to support the results of subjectively examining the degree of dry eye.

The study conducted by Rokohl et al. (2020), assessing the degree of dry eye using the OSDI, DEQ-5, and SANDE questionnaires, also obtained similar results, in which the subjective degree of dry eye was found to be significantly higher than the contralateral healthy eye. As many as 60% of the subjects suffered from mild to severe degrees of dry eye. The discomfort felt in the eye socket anophthalmia is found in subjects who use prostheses with an average length of use of 1 year.

The limitation of this study was that participants in anophthalmic sockets were not distinguished between

participants in anophthalmic sockets with or without wearing ocular prostheses, where long-term use of ocular prostheses would increase the inflammatory process occurs in the conjunctiva so that samples wearing prostheses experienced changes in impression cytology conjunctiva appears not only as a result of the dry eye process but also as a result of long-term use of ocular prostheses.

Conclusion

Significant differences existed in the degree of conjunctival impression cytology, proinflammatory cytokine IL-6, and dry eye between the anophthalmic socket eye and the contralateral healthy eye. A dry eye examination is required in each eye of the anophthalmic socket to administer appropriate therapy and artificial tear drops to each patient with anophthalmic socket as a preventive measure for dry eye in the anophthalmic socket eye.

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Author Contributions

Conceptualization, N.A. and H.P.; methodology, N.A., H.P., S.P., and J.S.; resources, N.A., H.P., S.P., J.S., R.M., and R.B.L.; writing of the original draft, preparation of the manuscript by N.A., H.P., S.P., J.S., R.M., and R.B.L. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

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