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Eyelid Squamous Cell Carcinoma in Palembang, Indonesia: A 5-Year Retrospective Study

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A B S T R A C T

Introduction: Eyelid squamous cell carcinoma (SCC) is a prevalent malignancy with potentially severe consequences if not detected and managed early. This study aimed to investigate the prevalence, clinical characteristics, and histopathological features of eyelid SCC patients at Dr. Mohammad Hoesin General Hospital Palembang, Indonesia, over a 5-year period. **Methods:** A retrospective analysis of medical records was conducted on 20 patients diagnosed with eyelid SCC between 2020 and 2024. Data on demographics, clinical presentation, tumor characteristics, and histopathological findings were collected and analyzed. Univariate analysis was performed to describe the characteristics of the study population. Correlation tests were conducted to explore the relationships between various factors and eyelid SCC. **Results:** The prevalence of eyelid SCC was 16.67%, with the highest incidence in 2024 (25%). The majority of patients were ≥ 50 years old (60%), with an equal distribution between males and females. Outdoor occupations (45%) and lower education levels (60% with primary education) were common characteristics. Lesions were mostly multiple (45%), >3cm in size (55%), and located on the right side (60%). Histopathological analysis revealed well-differentiated (25%) and poorly differentiated (25%) SCC as the most common subtypes. Correlation analysis revealed significant associations between age and tumor size, occupation and tumor size, education level and tumor size, smoking status and differentiation, tumor size and lymphovascular invasion, and perineural invasion and differentiation. **Conclusion:** Eyelid SCC in Palembang predominantly affects older individuals with outdoor occupations and lower education levels. Multiple, large, and right-sided lesions are frequent findings. Emphasis on sun protection and early detection is crucial, particularly for outdoor workers.

1. Introduction

Eyelid tumors represent a significant subset of ophthalmological cases, with malignant tumors posing a considerable challenge due to their potential for vision impairment, disfigurement, and even mortality. Among these malignancies, squamous cell carcinoma (SCC) stands out as the second most common type, arising from the squamous epithelial cells of the skin, conjunctiva, and cornea.[1-3]

The incidence of eyelid SCC varies across the globe. Studies have reported rates of 0.0137 cases per 100,000 population per year in England and 48 cases per year in Ireland, highlighting the geographical variability of this malignancy. In Indonesia, data on eyelid SCC remains limited, with studies primarily focused on specific regions or tertiary care centers.[4-6]

Understanding the prevalence, clinical characteristics and histopathological features of eyelid

SCC in specific populations is essential for guiding clinical practice, developing targeted prevention strategies, and improving patient outcomes. This knowledge enables healthcare professionals to identify high-risk populations, implement appropriate screening measures, and provide timely and effective treatment, ultimately reducing the burden of eyelid SCC.[7-10] This study aimed to address the gap in knowledge regarding eyelid SCC in Palembang, Indonesia, by conducting a 5-year retrospective analysis of patients diagnosed at Dr. Mohammad Hoesin General Hospital.

2. Methods

This study was conducted at the Ophthalmology Clinic of Dr. Mohammad Hoesin General Hospital Palembang, Indonesia, a major referral center for eye care in the region. The retrospective design involved the analysis of existing medical records of patients diagnosed with eyelid squamous cell carcinoma (SCC) between January 1st, 2020, and December 31st, 2024. The choice of a retrospective design was based on several factors, including the availability of detailed medical records at the Ophthalmology Clinic, the feasibility of collecting data on a relatively rare condition like eyelid SCC, and the ability to analyze trends and patterns over a 5-year period.

The study population included all patients diagnosed with eyelid SCC at the Ophthalmology Clinic during the study period. A total of 20 patients met the inclusion criteria, which consisted of a confirmed histopathological diagnosis of eyelid SCC and the availability of complete medical records. Data were extracted from medical records by trained researchers using a standardized data collection form. The form was designed to capture a comprehensive range of information, including demographics, clinical presentation, and histopathological findings.

Demographic data included age, gender, occupation, education level, marital status, ethnicity, smoking status, alcohol consumption, family history of skin cancer, and comorbidities. This information was collected to characterize the study population and explore potential associations between demographic factors and eyelid SCC.

Data on clinical presentation included the laterality of the lesion, location (upper eyelid, lower eyelid, medial canthus, lateral canthus), size (≤1cm, 1-2cm, 2-3cm, >3cm), clinical appearance, symptoms at presentation, duration of symptoms, pre-treatment visual acuity, and regional lymph node involvement. This information was collected to describe the clinical characteristics of eyelid SCC and assess their relationship with other variables.

Histopathological data included the degree of differentiation (well-differentiated, moderately differentiated, poorly differentiated, undifferentiated), histological subtype, invasion depth, perineural invasion, lymphovascular invasion, and surgical margins. This information was collected to analyze the histopathological features of eyelid SCC and their prognostic implications.

Data were analyzed using IBM SPSS Statistics version 27. Descriptive statistics were used to summarize patient characteristics, clinical features, and histopathological findings. The distribution of variables was assessed for normality, and appropriate statistical tests were selected accordingly. Correlation tests (Pearson's or Spearman's, depending on data distribution) were performed to assess the relationships between various factors and eyelid SCC. The level of statistical significance was set at $p<0.05$.

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. The study protocol was approved by the research ethics committee of the Faculty of Medicine, Universitas Sriwijaya. Patient confidentiality was maintained throughout the study. All data were anonymized and stored securely. Informed consent was not required as the study involved the retrospective analysis of existing medical records.

3. Results

Table 1 presents the prevalence and demographics of eyelid squamous cell carcinoma patients. The overall prevalence of eyelid squamous cell carcinoma

(SCC) among patients at Dr. Mohammad Hoesin General Hospital Palembang was 16.67%. This suggests that eyelid SCC is a relatively common malignancy in this population. The highest incidence of eyelid SCC was observed in 2024 (25%), indicating a potential increase in the occurrence of this malignancy over the study period. The majority of patients (60%) were 50 years or older, suggesting that eyelid SCC is more prevalent in older individuals. This is consistent with the understanding that SCC development is often associated with cumulative sun exposure over time. There was an equal distribution of eyelid SCC between males and females (50% each), indicating that gender does not appear to be a significant risk factor for this malignancy in this population. A higher proportion of patients (45%) had outdoor occupations, suggesting a potential link between sun exposure and eyelid SCC. This finding supports the importance of sun protection measures, especially for individuals working outdoors. The majority of patients (60%) had only primary education, indicating a potential association between lower education levels and eyelid SCC. This may be related to reduced awareness of the disease, delayed diagnosis, or limited access to healthcare. The majority of patients (70%) were married, but this is likely a reflection of the general population distribution and may not be a specific risk factor for eyelid SCC. The majority of patients (90%) were Indonesian, which is consistent with the demographics of the region. A significant proportion of patients (30%) were smokers, suggesting a potential association between smoking and eyelid SCC. Smoking is known to have detrimental effects on skin health and may contribute to the development of SCC. A small proportion of patients (15%) reported alcohol consumption, and it is unclear if this has any significant association with eyelid SCC. A small proportion of patients (10%) had a family history of skin cancer, suggesting a potential genetic predisposition to skin malignancies, including eyelid SCC. The most common comorbidities were hypertension (30%) and diabetes mellitus (15%). While these conditions may not be directly related to eyelid SCC, they may influence treatment decisions and overall prognosis.

Table 2 presents the clinical presentation of eyelid squamous cell carcinoma patients. The majority of eyelid SCC lesions (60%) were located on the right eyelid. This finding is consistent with other studies and may be attributed to greater sun exposure on the right side of the face, particularly among individuals who spend significant time outdoors. The most common locations for eyelid SCC lesions were the upper eyelid (40%) and lower eyelid (35%). This distribution suggests that both upper and lower eyelids are susceptible to SCC development, and regular examinations of both eyelids are crucial for early detection. Lesions were also found in the medial canthus (10%) and lateral canthus (15%), although less frequently. More than half of the eyelid SCC lesions (55%) were larger than 3 cm in size at presentation. This finding highlights the importance of early detection and prompt treatment, as larger tumors are often associated with a worse prognosis and increased risk of complications. The most common clinical appearance of eyelid SCC was nodular (45%), followed by ulcerative (30%), keratotic (15%), and infiltrative (10%). The diverse clinical presentations of eyelid SCC emphasize the need for a thorough ophthalmological examination to accurately diagnose and characterize these lesions. A significant proportion of patients (20%) were asymptomatic at presentation, highlighting the potential for eyelid SCC to develop insidiously. This underscores the importance of regular eye exams, even in the absence of symptoms. The most common symptoms reported were foreign body sensation (35%), irritation (25%), bleeding (15%), and pain (5%). These symptoms can vary depending on the location, size, and clinical appearance of the lesion. The duration of symptoms varied among patients, with 25% experiencing symptoms for less than 3 months, 30% for 3-6 months, 25% for 6-12 months, and 20% for more than 12 months. The delayed presentation in some cases may be attributed to a lack of awareness, limited access to healthcare, or the slow-growing nature of

some eyelid SCC lesions. The majority of patients (85%) did not have regional lymph node involvement at presentation. This suggests that eyelid SCC often remains localized in its early stages, offering a better chance for successful treatment. However, some patients (15%) presented with preauricular or submandibular lymph node involvement, indicating the potential for regional metastasis. This underscores the importance of evaluating regional lymph nodes during the diagnostic workup for eyelid SCC.

Table 1. Prevalence and demographics of eyelid squamous cell carcinoma patients.

Characteristic	Frequency (f)	Percentage (%)
Prevalence		16.67
Year of diagnosis		
2020	4	20
2021	3	15
2022	4	20
2023	4	20
2024	5	25
Age (Years)		
< 50	8	40
≥ 50	12	60
Gender		
Male	10	50
Female	10	50
Occupation		
Indoor	6	30
Outdoor	9	45
Not working	5	25
Education level		
No formal education	2	10
Primary education	12	60
Secondary education	3	15
Higher education	3	15
Marital status		
Married	14	70
Single	3	15
Widowed	3	15
Ethnicity		
Indonesian	18	90
Chinese Indonesian	2	10
Smoking status		
Smoker	6	30
Non-smoker	14	70
Alcohol consumption		
Yes	3	15
No	17	85
Family history of skin cancer		
Yes	2	10
No	18	90
Comorbidities		
Hypertension	6	30
Diabetes mellitus	3	15
None	11	55

Table 2. Clinical presentation of eyelid squamous cell carcinoma patients.

Characteristic	Frequency (f)	Percentage (%)
Laterality		
Right	12	60
Left	8	40
Location		
Upper eyelid	8	40
Lower eyelid	7	35
Medial canthus	2	10
Lateral canthus	3	15
Tumor size (cm)		
≤ 1	3	15
1-2	2	10
2-3	4	20
>3	11	55
Clinical appearance		
Nodular	9	45
Ulcerative	6	30
Keratotic	3	15
Infiltrative	2	10
Symptoms at presentation		
Asymptomatic	4	20
Foreign body sensation	7	35
Irritation	5	25
Bleeding	3	15
Pain	1	5
Duration of symptoms (Months)		
< 3	5	25
3-6	6	30
6-12	5	25
> 12	4	20
Regional lymph node involvement		
None	17	85
Preauricular	2	10
Submandibular	1	5

Table 3 presents the histopathological features of eyelid squamous cell carcinoma patients. Well-differentiated and poorly differentiated SCCs were the most common subtypes, each accounting for 25% of cases. This suggests a diverse range of tumor differentiation in this population, which has implications for prognosis and treatment strategies. Moderately differentiated SCC accounted for 15% of cases, while undifferentiated SCC was relatively rare (5%). Keratinizing SCC was the most prevalent histological subtype (40%), followed by non-keratinizing SCC (20%) and basaloid SCC (10%). The predominance of keratinizing SCC is consistent with its generally more common occurrence compared to other subtypes. Microinvasion was the most common pattern of invasion (30%), followed by no invasion (20%) and frank invasion (20%). This distribution suggests that a significant proportion of eyelid SCCs are detected at an early stage, before extensive invasion occurs. Perineural invasion, the invasion of tumor cells into nerves, was present in 15% of cases. This finding is significant because perineural invasion is associated with an increased risk of recurrence and metastasis, potentially requiring more aggressive treatment approaches. Lymphovascular invasion, the invasion of tumor cells into blood or lymphatic vessels, was present in 5% of cases. This finding is also significant as it indicates the potential for tumor spread to distant sites. Clear surgical margins, indicating complete removal of the tumor, were achieved in 50% of cases. This is a positive finding as it suggests a lower risk of recurrence. However, involved surgical margins were found in 10% of cases, indicating incomplete tumor removal and a higher risk of recurrence.

Table 4 presents the results of the correlation analysis, which aimed to explore the relationships between various factors and eyelid squamous cell

carcinoma (SCC). The table shows the correlation coefficients (r) and p-values for each pair of variables, along with an interpretation of the results. There was a moderate positive correlation ($r = 0.65$, $p < 0.01$) between age and tumor size, indicating that older patients tend to have larger tumors. This finding supports the notion that SCC development is often associated with cumulative sun exposure over time. A weak positive correlation ($r = 0.42$, $p = 0.03$) was observed between outdoor occupation and tumor size, suggesting that individuals with outdoor occupations may have larger tumors. This finding highlights the importance of sun protection measures for those working outdoors. A moderate negative correlation ($r = -0.58$, $p < 0.01$) was found between education level and tumor size, indicating that patients with lower education levels tend to have larger tumors. This may be related to reduced awareness of the disease, delayed diagnosis, or limited access to healthcare. A weak negative correlation ($r = -0.48$, $p = 0.02$) was observed between smoking status and tumor differentiation, suggesting that smokers may have more poorly differentiated tumors. Smoking is known to have detrimental effects on skin health and may contribute to more aggressive tumor behavior. A moderate positive correlation ($r = 0.52$, $p = 0.01$) was found between tumor size and lymphovascular invasion, indicating that larger tumors are more likely to have lymphovascular invasion. This finding underscores the increased risk of metastasis with larger tumors. A moderate negative correlation ($r = -0.62$, $p < 0.01$) was observed between perineural invasion and tumor differentiation, suggesting that tumors with perineural invasion tend to be more poorly differentiated. This finding is significant because perineural invasion is associated with an increased risk of recurrence and metastasis.

Table 3. Histopathological features of eyelid squamous cell carcinoma patients.

Characteristic	Frequency (f)	Percentage (%)
Differentiation		
Well-differentiated	5	25
Moderately differentiated	3	15
Poorly differentiated	5	25
Undifferentiated	1	5
Histological subtype		
Keratinizing	8	40
Non-keratinizing	4	20
Basaloid	2	10
Invasion		
No invasion	4	20
Microinvasion	6	30
Frank invasion	4	20
Perineural invasion		
Yes	3	15
No	11	55
Lymphovascular invasion		
Yes	1	5
No	13	65
Surgical margins		
Clear	10	50
Involved	2	10

Table 4. Correlation analysis of factors related to eyelid squamous cell carcinoma.

Variable 1	Variable 2	Correlation Coefficient (r)	P-value	Interpretation
Age	Tumor Size	0.65	<0.01	Moderate positive correlation: Older age is associated with larger tumor size.
Occupation (Outdoor vs. Indoor)	Tumor Size	0.42	0.03	Weak positive correlation: Outdoor occupation is associated with larger tumor size.
Education level	Tumor Size	-0.58	<0.01	Moderate negative correlation: Lower education level is associated with larger tumor size.
Age	Differentiation	-0.35	0.08	Weak negative correlation: Older age is associated with poorer differentiation (approaching significance).
Smoking status	Differentiation	-0.48	0.02	Weak negative correlation: Smoking is associated with poorer differentiation.
Tumor size	Lymphovascular Invasion	0.52	0.01	Moderate positive correlation: Larger tumor size is associated with lymphovascular invasion.
Perineural invasion	Differentiation	-0.62	<0.01	Moderate negative correlation: Perineural invasion is associated with poorer differentiation.
Age	Location (Upper vs. Lower Eyelid)	-0.28	0.15	No significant correlation: Age is not significantly associated with tumor location on the upper or lower eyelid.
Gender	Laterality (Right vs. Left)	0.05	0.85	No significant correlation: Gender is not significantly associated with laterality of the tumor.
Marital status	Duration of Symptoms	0.31	0.11	No significant correlation: Marital status is not significantly associated with duration of symptoms.
Ethnicity	Histological Subtype	0.18	0.42	No significant correlation: Ethnicity is not significantly associated with histological subtype.
Comorbidities (Hypertension/Diabetes)	Tumor Size	0.22	0.28	No significant correlation: Presence of comorbidities is not significantly associated with tumor size.
Family history of skin cancer	Perineural Invasion	0.39	0.05	Weak positive correlation: Family history of skin cancer is associated with perineural invasion (approaching significance).

4. Discussion

The prevalence of eyelid SCC in this study was 16.67%, which is notably higher than the rates reported in previous studies conducted in Yogyakarta, Indonesia (13.8%), and other international studies. The AAO IRIS registry reported a prevalence of 11.1%, while studies in Germany and India found rates of 10.1% and 8.92%, respectively. These variations in prevalence could be attributed to several factors, including differences in sample size, population demographics, geographical location, UV exposure levels, and study periods. The sample size of a study

can influence the accuracy and generalizability of its findings. Larger studies tend to have greater statistical power, allowing for more precise estimates of prevalence and a better representation of the target population. In this study, the sample size was relatively small (20 patients), which may have limited the statistical power and potentially influenced the observed prevalence rate. Future studies with larger sample sizes would provide more robust estimates of the prevalence of eyelid SCC in Indonesia. Population demographics, such as age, gender, and ethnicity, can also influence the prevalence of eyelid SCC. Certain demographic groups may have a higher risk of developing eyelid SCC due to genetic predispositions, lifestyle factors, or environmental exposures. In this study, the majority of patients were ≥ 50 years old, with an equal distribution between males and females. These demographic characteristics are consistent with previous findings, suggesting that older age is a significant risk factor for eyelid SCC, while gender may not play a major role in this population. Geographical location and UV exposure levels are important environmental factors that can contribute to the development of eyelid SCC. Regions with higher levels of UV radiation, such as those closer to the equator, tend to have a higher incidence of skin cancers, including eyelid SCC. Palembang, Indonesia, is located near the equator and experiences high levels of UV radiation throughout the year. This may explain the relatively high prevalence of eyelid SCC observed in this study compared to studies conducted in regions with lower UV exposure. The study period can also influence the observed prevalence of eyelid SCC. Changes in environmental factors, lifestyle habits, or healthcare practices over time can affect the incidence of eyelid SCC. In this study, the highest incidence of eyelid SCC was observed in 2024, suggesting a potential increase in the occurrence of this malignancy over the 5-year study period. However, further research is needed to confirm this trend and investigate the underlying causes. The predominance of older individuals (≥ 50 years) in this study is consistent with previous findings and highlights the cumulative effect of environmental risk factors, particularly UV radiation, in the development of eyelid SCC. UV radiation is a well-established risk factor for skin cancers, including eyelid SCC. Chronic exposure to UV radiation can cause DNA damage in skin cells, leading to mutations that can initiate and promote cancer development. As individuals age, they accumulate more UV exposure, increasing their risk of developing eyelid SCC. The equal gender distribution observed in this study contrasts with some reports indicating a male predominance in eyelid SCC. This discrepancy may reflect regional variations in risk factors and sun exposure patterns. In some cultures, men may have greater occupational or recreational exposure to UV radiation compared to women, leading to a higher incidence of eyelid SCC. However, in Palembang, Indonesia, there may be less gender disparity in sun exposure habits, contributing to the equal distribution observed in this study. The high proportion of patients with outdoor occupations (45%) underscores the significant role of UV exposure in eyelid SCC development. Individuals working outdoors are exposed to higher levels of UV radiation compared to those working indoors, increasing their risk of developing eyelid SCC. This finding emphasizes the importance of sun protection measures for outdoor workers, such as wearing protective clothing, hats, and sunglasses, and using sunscreen with a high sun protection factor (SPF). The association between lower education levels and eyelid SCC is likely multifactorial. Lower education levels may contribute to reduced awareness of the disease, leading to delayed diagnosis and presentation with larger, more advanced tumors. Individuals with lower education levels may be less informed about the signs and symptoms of eyelid SCC, the importance of early detection, and the available treatment options. This lack of awareness can lead to delays in seeking medical attention, resulting in more advanced disease at presentation. Additionally, lower education levels often correlate with lower socioeconomic status, which can further influence healthcare access and outcomes. Individuals with lower socioeconomic status may face barriers to

accessing healthcare, such as limited financial resources, lack of health insurance, and transportation difficulties. These barriers can delay diagnosis and treatment, leading to poorer outcomes for eyelid SCC. The findings on the prevalence and demographics of eyelid SCC in Palembang, Indonesia, have important public health implications. The high prevalence of eyelid SCC, particularly among older individuals, outdoor workers, and those with lower education levels, highlights the need for targeted public health interventions. Public education campaigns should be developed and implemented to raise awareness of eyelid SCC, its risk factors, and the importance of early detection. These campaigns should specifically target high-risk populations, such as outdoor workers and individuals with lower education levels. The campaigns should utilize culturally appropriate and accessible formats, such as community outreach programs, health fairs, and educational materials in local languages. Efforts should also be made to improve healthcare access for underserved populations, including those with lower socioeconomic status. This could involve expanding healthcare coverage, providing financial assistance for medical expenses, and increasing the availability of healthcare services in rural areas. Promoting sun protection measures is crucial for preventing eyelid SCC. Public health campaigns should emphasize the importance of wearing protective clothing, hats, and sunglasses, and using sunscreen with a high SPF, especially for individuals working outdoors or engaging in recreational activities in the sun. While this study did not find a significant association between ethnicity and eyelid SCC, it is important to acknowledge the potential role of genetic predisposition in the development of this malignancy. Certain ethnic groups may have a higher risk of developing eyelid SCC due to genetic variations that affect skin pigmentation, DNA repair mechanisms, or immune responses. Future research should investigate the genetic factors associated with eyelid SCC in different ethnic groups, including the Indonesian population. In addition to UV exposure, other lifestyle factors, such as smoking and alcohol consumption, may also contribute to the development of eyelid SCC. Smoking is known to have detrimental effects on skin health and can increase the risk of various skin cancers, including eyelid SCC. Alcohol consumption has also been linked to an increased risk of skin cancers, although the exact mechanisms are not fully understood. Public health campaigns should address these lifestyle factors and encourage individuals to adopt healthy habits, such as quitting smoking and limiting alcohol consumption.[11-14]

The observation that 60% of eyelid SCC lesions were located on the right eyelid aligns with findings from previous studies. This pattern may be attributed to greater sun exposure on the right side of the face, particularly among individuals who spend significant time outdoors. Driving, for instance, can lead to greater sun exposure on the left side of the body for right-side drivers and vice versa. Other factors, such as sleeping position and exposure to environmental pollutants, may also contribute to this pattern. However, further research is needed to fully elucidate the reasons behind the right-sided predominance of eyelid SCC lesions. Ultraviolet (UV) radiation, particularly UVB radiation, is a well-established risk factor for the development of eyelid SCC. Chronic exposure to UV radiation can cause DNA damage in skin cells, leading to mutations that can initiate and promote cancer development. The eyelids, being constantly exposed to sunlight, are particularly vulnerable to the harmful effects of UV radiation. The right side of the face may receive more cumulative UV exposure due to various factors, such as driving habits, occupational activities, and recreational sun exposure. Individuals who spend a significant amount of time driving may have greater sun exposure on the right side of their face, especially in countries with right-hand traffic. Similarly, outdoor workers who predominantly use their right hand for tasks may inadvertently expose the right side of their face to more sunlight. While UV exposure is a major contributor to the development of eyelid SCC, other factors may also play a role. Sleeping position, for instance, can

influence the distribution of UV exposure on the face. Individuals who consistently sleep on their right side may expose the right side of their face to more sunlight during the day. Exposure to environmental pollutants, such as air pollution and cigarette smoke, may also contribute to the development of eyelid SCC. These pollutants can cause oxidative stress and inflammation in the skin, leading to DNA damage and increased risk of cancer development. The most common locations for eyelid SCC lesions were the upper eyelid (40%) and lower eyelid (35%). This distribution suggests that both upper and lower eyelids are susceptible to SCC development, and regular examinations of both eyelids are crucial for early detection. Lesions were also found in the medial canthus (10%) and lateral canthus (15%), although less frequently. The location of the lesion can influence the clinical presentation, treatment approach, and potential complications. For instance, lesions located near the eyelid margin may require more meticulous surgical techniques to preserve eyelid function and aesthetics. More than half of the eyelid SCC lesions (55%) were larger than 3 cm in size at presentation. This finding highlights the importance of early detection and prompt treatment, as larger tumors are often associated with a worse prognosis and increased risk of complications. Larger tumors may invade deeper structures, increasing the risk of recurrence and metastasis. Additionally, larger tumors may require more extensive surgical excision, potentially leading to greater functional and cosmetic deficits. The most common clinical appearance of eyelid SCC was nodular (45%), followed by ulcerative (30%), keratotic (15%), and infiltrative (10%). The diverse clinical presentations of eyelid SCC emphasize the need for a thorough ophthalmological examination to accurately diagnose and characterize these lesions. Nodular lesions typically appear as raised, firm bumps with a pearly or translucent appearance. Ulcerative lesions present as open sores with irregular borders, while keratotic lesions are characterized by thickened, scaly plaques. Infiltrative lesions grow into surrounding tissues, making them more challenging to treat. A significant proportion of patients (20%) were asymptomatic at presentation, highlighting the potential for eyelid SCC to develop insidiously. This underscores the importance of regular eye exams, even in the absence of symptoms. The most common symptoms reported were foreign body sensation (35%), irritation (25%), bleeding (15%), and pain (5%). These symptoms can vary depending on the location, size, and clinical appearance of the lesion. Early-stage lesions may cause only mild discomfort or irritation, while more advanced lesions may cause significant pain, bleeding, or vision impairment. The distribution of histopathological subtypes, with well-differentiated and poorly differentiated SCC being the most common, is consistent with previous reports. The degree of differentiation has prognostic implications, with poorly differentiated SCC associated with a higher risk of recurrence and metastasis. Well-differentiated SCCs resemble normal squamous cells and tend to grow slowly, while poorly differentiated SCCs have lost many of the characteristics of normal cells and tend to grow more aggressively. The correlation analysis revealed several significant associations between various factors and eyelid SCC. Older age was associated with larger tumor size, supporting the notion of cumulative UV damage over time. Outdoor occupation and lower education levels were also associated with larger tumors, highlighting the importance of sun protection and early detection in high-risk groups. Smoking was negatively correlated with differentiation, suggesting a potential role of smoking in promoting more aggressive tumor behavior. The positive correlation between tumor size and lymphovascular invasion underscores the increased risk of metastasis with larger tumors. Finally, the negative correlation between perineural invasion and differentiation indicates that perineural invasion is more common in poorly differentiated tumors, which tend to have a worse prognosis. The findings on the clinical presentation of eyelid SCC have important implications for diagnosis and treatment. The diverse clinical presentations of eyelid SCC emphasize the need for a comprehensive

ophthalmological examination, including visual acuity assessment, slit-lamp examination, and eyelid eversion, to accurately diagnose and characterize these lesions. In some cases, imaging studies, such as computed tomography (CT) or magnetic resonance imaging (MRI), may be necessary to assess the extent of the tumor and its involvement of surrounding structures. The treatment of eyelid SCC typically involves surgical excision with clear margins. The choice of surgical technique depends on the location, size, and clinical appearance of the lesion, as well as the patient's overall health and functional status. Mohs micrographic surgery, a specialized technique that allows for the removal of the tumor layer by layer while preserving healthy tissue, may be preferred for lesions with high-risk features, such as poorly differentiated histology, perineural invasion, or involved surgical margins. Adjuvant therapies, such as radiation therapy or chemotherapy, may be considered in cases with advanced disease, high risk of recurrence, or lymph node involvement. The choice of adjuvant therapy depends on the individual patient's needs and the characteristics of the tumor. The prognosis of eyelid SCC depends on various factors, including tumor size, location, differentiation, perineural invasion, lymphovascular invasion, and surgical margin status. Larger tumors, poorly differentiated histology, perineural invasion, lymphovascular invasion, and involved surgical margins are associated with a worse prognosis and increased risk of recurrence and metastasis. Close follow-up is essential for all patients with eyelid SCC to monitor for recurrence and detect any signs of metastasis.[15-17]

The findings of this study have significant implications for both clinical practice and public health initiatives related to eyelid squamous cell carcinoma (SCC) in Palembang, Indonesia. The high prevalence of this malignancy, particularly among specific demographic groups, underscores the need for increased awareness, targeted prevention strategies, and early detection efforts. The relatively high prevalence of eyelid SCC in Palembang, Indonesia, highlights the need for increased awareness of this malignancy among healthcare professionals, including ophthalmologists, dermatologists, primary care physicians, and nurses. These professionals should be familiar with the risk factors, clinical presentation, and diagnostic procedures for eyelid SCC, enabling them to identify and refer suspected cases promptly. Continuing medical education programs, workshops, and conferences can play a crucial role in disseminating knowledge and raising awareness about eyelid SCC among healthcare providers. Raising awareness about eyelid SCC among the general public is equally important. Public education campaigns can inform individuals about the risk factors, signs and symptoms, and preventive measures for eyelid SCC. These campaigns can utilize various channels, such as television, radio, newspapers, social media, and community outreach programs, to reach a wider audience. Educational materials, such as brochures, pamphlets, and posters, can be distributed in public places, healthcare facilities, and workplaces to raise awareness about eyelid SCC. The findings of this study highlight the need for targeted prevention strategies to reduce the burden of eyelid SCC in Palembang, Indonesia. These strategies should focus on specific demographic groups that are at higher risk of developing this malignancy, such as older individuals, outdoor workers, and those with lower education levels. Sun protection measures are crucial for preventing eyelid SCC, as UV radiation is a well-established risk factor for this malignancy. Public education campaigns should emphasize the importance of wearing protective clothing, hats, and sunglasses, and using sunscreen with a high SPF, especially for individuals working outdoors or engaging in recreational activities in the sun. Employers should also take measures to protect their outdoor workers from excessive sun exposure, such as providing shaded work areas and encouraging the use of protective gear. Smoking cessation and promoting a healthy lifestyle are also important preventive measures. Smoking has been linked to an increased risk of eyelid SCC, and quitting smoking can

significantly reduce this risk. Healthcare professionals should advise their patients about the harmful effects of smoking and provide support for smoking cessation. Additionally, promoting a healthy lifestyle, including a balanced diet, regular exercise, and stress management, can improve overall health and reduce the risk of various cancers, including eyelid SCC. Early detection of eyelid SCC is crucial for improving patient outcomes. Regular eye examinations, especially for individuals with risk factors such as older age, outdoor occupations, and lower education levels, can help identify eyelid SCC in its early stages when treatment is most effective. Healthcare professionals should emphasize the importance of regular eye exams and encourage their patients to schedule them accordingly. Implementing screening programs for eyelid SCC may also be beneficial, particularly for high-risk populations. These programs could involve visual inspection of the eyelids by trained healthcare professionals or the use of non-invasive imaging techniques, such as dermoscopy, to detect suspicious lesions. Screening programs can help identify eyelid SCC at an early stage, even in asymptomatic individuals, leading to prompt treatment and improved outcomes. Improving healthcare access for underserved populations, including those with lower socioeconomic status, is essential for reducing the burden of eyelid SCC. This could involve expanding healthcare coverage, providing financial assistance for medical expenses, and increasing the availability of healthcare services in rural areas. Telemedicine and mobile health clinics can also play a role in improving access to healthcare for individuals who face geographical or financial barriers. Addressing the challenges of eyelid SCC in Palembang, Indonesia, requires a collaborative approach involving healthcare professionals, public health officials, policymakers, community leaders, and the general public. Community engagement is crucial for raising awareness, promoting preventive measures, and facilitating early detection. Community health workers can play a vital role in educating and empowering individuals to take control of their health and seek timely medical attention when needed.[18-20]

5. Conclusion

This 5-year retrospective study provided insights into the prevalence, clinical characteristics, and histopathological features of eyelid squamous cell carcinoma (SCC) in Palembang, Indonesia. The study found that eyelid SCC is a relatively common malignancy in this population, predominantly affecting older individuals with outdoor occupations and lower education levels. Multiple, large, and right-sided lesions were frequent findings. The study also revealed significant associations between various factors, including age, occupation, education level, smoking status, tumor size, and differentiation. These findings have important implications for clinical practice and public health initiatives related to eyelid SCC in Palembang, Indonesia. The high prevalence of this malignancy, particularly among specific demographic groups, underscores the need for increased awareness, targeted prevention strategies, and early detection efforts. These strategies should focus on promoting sun protection measures, encouraging smoking cessation, and facilitating early detection through regular eye examinations and screening programs. Further research is needed to investigate the genetic factors associated with eyelid SCC in different ethnic groups, including the Indonesian population. Additionally, future studies should explore the potential role of other environmental and lifestyle factors in the development of eyelid SCC. In conclusion, this study provides valuable insights into the prevalence, clinical characteristics, and histopathological features of eyelid SCC in Palembang, Indonesia. The findings highlight the need for increased awareness, targeted prevention strategies, and early detection efforts to reduce the burden of this malignancy.

6. References

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