JURNAL
REKONSTRUKSI DAN ESTETIK

META-ANALYSIS: SQUAMOUS CELL CARCINOMA CASES ARISING FROM MORBUS HANSEN IN DR. SITANALA CENTRAL HOSPITAL (2011-2021)

Francisca Victoria*, Sweety Pribadi

Department of Plastic Reconstructive and Aesthetic Surgery, Dr. Sitanala Central Hospital, Tanggerang, Indonesia

ARTICLE INFO

Keywords: Carcinoma, leprosy, Morbus Hansen, infectious disease, squamous cell carcinoma, quality of life

***Corresponding author*:**
Francisca Victoria
Email address:
franciscavictoria96@gmail.com

***History*:**
Received: June 28, 2023
Revised: May 12, 2023
Accepted: May 23, 2023
Published: June 1, 2023

JRE : Jurnal Rekonstruksi dan Estetik
e-ISSN:2774-6062; p-ISSN: 2684-9453
DOI: 10.20473/jre.v8i1.37048
Open access :
Creative Commons Attribution-ShareAlike 4.0 International License (CC-BY-SA)
Available at:
https://e-journal.unair.ac.id/JRE/

***How to cite*:** Victoria F & Pribadi S. META-ANALYSIS: SQUAMOUS CELL CARCINOMA CASES ARISING FROM MORBUS HANSEN IN DR. SITANALA CENTRAL HOSPITAL (2011-2021). Jurnal Rekonstruksi dan Estetik.2023; 8(1): 39-46.

ABSTRACT

Introduction: Leprosy, a chronic systemic infection caused by Mycobacterium Leprae, has been associated with the development of cutaneous neoplasms, such as squamous cell carcinoma. This study aimed to examine the characteristics of patients diagnosed with squamous cell carcinoma arising from Morbus Hansen (leprosy).

Methods: A retrospective analysis of medical records from Dr. Sitanala Central Hospital was conducted, focusing on patients diagnosed with squamous cell carcinoma arising from Morbus Hansen over 10 years from 2011 to 2021. Descriptive analysis was performed on the collected data.

Results: In this study, out of the twenty-one patients, the majority were male (86%), and the most common age group affected was between 46 and 55 years, accounting for 43% of the cases. Most patients had Morbus Hansen type BL (borderline lepromatous) and had been living with the condition for an average of 23 years. Additionally, a significant number of patients had a normal body mass index (52%) within the range of 20-24.9. Anemia was the main comorbidity observed, affecting 46% of the patients.

Conclusion: Examining the clinical profile of these patients helps healthcare providers identify specific characteristics associated with this condition, further research with more comprehensive data is necessary to ensure accuracy. Future studies could also explore potential connections between hypertension, anemia, and squamous cell carcinoma arising from Morbus Hansen.

Highlights:

1. The majority of SCC cases were observed in males (86%), emphasizing a higher susceptibility of males to this form of cancer compared to females (14%).
2. The study identified an increased risk of SCC particularly among individuals in the 46-55 and 56-65 age groups.
3. The study revealed that a significant proportion of Morbus Hansen patients with SCC had a normal weight, while the occurrence of overweight and obesity was relatively low.
4. Maintaining a healthy body weight may play a role in reducing the risk of SCC in this patient population.

INTRODUCTION

Morbus Hansen, better known as leprosy, Leprosy is a chronic infectious disease caused by the bacteria Mycobacterium leprae. It primarily affects the skin and peripheral nerves, leading to various symptoms such as neuropathy, deformities, and, in severe cases, auto-amputation of digits[1]. In cases where auto-amputation does not occur, chronic skin injuries can develop, which increases the risk of complications such as the development of squamous cell carcinoma (SCC). SCC is a type of skin cancer that arises from the squamous cells in the outer layer of the skin. The chronic skin injuries associated with leprosy can create an environment conducive to the development of SCC[11].

It is a chronic granulomatous infection that is endemic in some developing countries. In 2015, the global prevalence of leprosy was reported to be 210,758 cases[13]. The World Health Organization (WHO) data for 2019 suggests that a total of 202,185 new cases were detected globally. Brazil, India, and Indonesia topped the list with more than 10,000 cases each[2]. The majority of these cases were found in the Southeast Asian region, with 156,118 patients, followed by the Americas region with 28,806 patients, and Africa with 20,004 patients[12]. Indonesia is the third country with the highest incidence of leprosy with 15,910 people diagnosed in 2017. The top two countries with the highest number of new cases were India and Brazil[1, 12, 13]. This disease has been known as far back as 3000 years ago.

The prevalence of leprosy in Indonesia in 2017 was reported to be 0.70 cases per 10,000 population. Additionally, the number of new cases found was 6.07 cases per year for every 100,000 individuals. In ten provinces of Indonesia, the prevalence of leprosy was still higher than 1 case per 10,000 population. These cases were spread across approximately 7,548 villages, covering a working area of around 1,975 health centers in 341 regencies/cities throughout Indonesia[12,13].

Neurological damage of patients with leprosy contributes to the frequent incidence of lesions, especially on the hands and feet, with the manifestation of skin dryness, fissures, and ulcerations, also secondary infection in the bone and soft tissues, not rarely causing deformities[3]. Malignant development may be associated with chronicity, continuous trauma, neglect of skincare, or osteomyelitis. SCC has been described as a complication of chronic, usually plantar, ulcers in leprosy patients[4]. Individuals with leprosy need to receive appropriate medical care and management to prevent complications and minimize the risk of developing SCC or other associated complications. Early diagnosis and treatment of leprosy are crucial in preventing long-term damage and minimizing the risk of these complications[11]. The objective of this descriptive study is to describe the clinical profile of patients developing squamous cell carcinoma arising from Morbus Hansen in Dr. Sitanala central hospital years 2011-2021.

METHODS

The purpose of this study is to identify the traits of Morbus Hansen-caused SCC patients at Dr. Sitanala Central Leprosy Hospital between 2011 and 2021. Therefore, this study will be carried out utilizing the descriptive retrospective design research method through observation and examination of the patient's medical records. Describing a phenomenon and its traits is the aim of descriptive study[5].

All Morbus Hansen-related squamous cell carcinoma patients treated at Dr. Sitanala Central Hospital between 2011 and 2021 comprised the study's population. The study population that the chosen research sample

belonged to—patients with Morbus Hansen developing SCC—met the inclusion criteria. The content analysis method was used to collect samples, which involves gathering information by reading and studying data from documents (in this case, medical records), which is then compiled and arranged to display the patient's clinical profiles and produce reliable conclusions[5].

Variables used in this research were the medical state of the patients which includes age, gender, body mass index, Morbus Hansen type infection, duration of disease, and comorbid diseases. Variable data from the research was then analyzed with the descriptive method, the data gathered will then be presented in a table format.

Through systematic grouping, each variable was categorized. The age of the patients was divided into 9 groupings 6, as indicated in Table 2. Underweight, normal, overweight, and obese (class I, II, and III) BMI categories were used[7]. According to the Ridley-Jopling classification of leprosy, there are four different types of leprosy: lepromatous-leprosy (LL), borderline-lepromatous (BL), and borderline-tuberculoid (TT)[8].

Patients' data were accessed after approval was granted by the hospital and the researcher vows to keep patients' identities confidential. Results from this research will only be used for the advancement of medical sciences and not for any other purposes.

RESULTS

A total of 21 cases of SCC arising from Morbus Hansen patients were seen during the 10 years. Of the 21 patients, 18 (86 %) were males and 3 (14%) were females (Table 1). The average age (male and female) at the time of diagnosis was 54 years (ranging from 26 to 70 years), and 43% were between the age of 46- 55 years (Table 2).

Table 1. Patients' gender classification of SCC arising from Morbus Hansen patients

Gender		
Classification	Male	Female
Amount	18	3
Percentage	86%	14%

Table 2. Patient's Age classification of SCC arising from Morbus Hansen patients

Age		
Classification	Amount	Percentage
<5	0	0%
5-11	0	0%
12-16	0	0%
17-25	0	0%
26-35	1	5%
36-45	2	10%
46-55	9	43%
56-65	7	32%
>65	2	10%

Of all patients, 11 (52%) have normal Body Mass Index, followed by underweight (33%) and overweight (10%). Only 1 patient was found obese in class I, and none in the second and third classes (Table 3). Though most (62%) of the Morbus Hansen type was not recorded, the distribution of the leprosy classification (Ridley-Jopling) was as follows (Table 4): borderline-tuberculoid (BT): 3 (14 %); borderline lepromatous (BL): 4 (19%) and lepromatous (LL): 1 (5%). Due to the long duration of the disease, some patients have incomplete records of their first diagnosis of morbus hansen. From the ones that have their data recorded, the average duration of leprosy at the time of diagnosis was 23 years, ranging from 4 to 30 years (Table 5). Most patients have no comorbid recorded, but the main comorbid found were hypertension (36%), also anemia (28%), diabetes (21%), and tuberculosis (14%)(Table 6).

Table 3. Patients' Body Mass Index classification of SCC arising from Morbus Hansen patients

Body Mass Index		
Classification	Amount	Percentage
Underweight (15-19.9)	7	33%
Normal (20 – 24.9)	11	52%
Overweight (25 – 29.9)	2	10%
Class I Obese (30 –34.9)	1	5%
Class II Obese (35-39.9)	0	0%
Class III Obese (>40)	0	10%

Table 4. Morbus Hansen type

Morbus Hansen Type		
Classification	Amount	Percentage
TT	0	0%
BT	3	14%
BB	0	0%
BL	4	19%
LL	1	5%
unknown	13	62%

Table 5. Patients' Disease Duration of SCC arising from Morbus Hansen patients

Duration						
Year	4	12	27	28	29	30
Amount	1	1	1	1	2	1
Average	23 years					

Table 6. Comorbid SCC arising from Morbus Hansen patients

Comorbid		
Classification	Amount	Percentage
Diabetes	3	21%
Anemia	4	28%
Hypertension	5	36%
Tuberculosis	2	14%

DISCUSSIONS

Table 1 provides the gender classification of squamous cell carcinoma (SCC) cases that have arisen from patients with Morbus Hansen (leprosy). The table presents the number of cases for each gender category. There were 18 cases among males and 3 cases among females. The corresponding percentages indicate that males accounted for 86% of the SCC cases, while females accounted for 14%.

Table 2 presents the age classification of SCC cases among Morbus Hansen patients. The table categorizes the cases based on different age groups. The numbers represent the cases found within each age group. There were no cases reported in the age groups "<5" and "5-11". The first case was reported in the "26-35" age group, with a total of 1 case. The number of cases increased in subsequent age groups, with 2 cases in "36-45", 9 cases in "46-55", 7 cases in "56-65", and 2 cases in ">65". The percentages show the distribution of cases within each age group.

Table 3 provided data presents the classification of Body Mass Index (BMI) with corresponding amounts and percentages. Among the individuals studied, 33% were classified as underweight (BMI 15-19.9), 52% fell within the normal weight range (BMI 20-24.9), 10% were classified as overweight (BMI 25-29.9), and 5% were classified as Class I obese (BMI 30-34.9). There were no reported cases in the Class II

Obese (BMI 35-39.9) category, while 10% of the cases were categorized as Class III Obese (BMI >40). This data provides insights into the distribution of BMI categories within the studied population, highlighting the prevalence of normal weight and the relatively low occurrence of overweight and obese classifications.

The data suggest that SCC arising from Morbus Hansen is more common in males compared to females. Additionally, it appears that the risk of developing SCC increases with age, particularly in the 46-55 and 56-65 age ranges.

The Ridley-Jopling criteria is a classification system commonly used by researchers in leprosy studies[14]. This classification is based on the examination of lymphocyte and macrophage populations in skin lesions and defines a spectrum of five different types of leprosy. The spectrum includes polar forms, such as tuberculoid (TT) and lepromatous (LL) leprosy, as well as borderline forms, including borderline tuberculoid (BT), borderline lepromatous (BL), and borderline-borderline (BB) leprosy (Figure 1)[15].

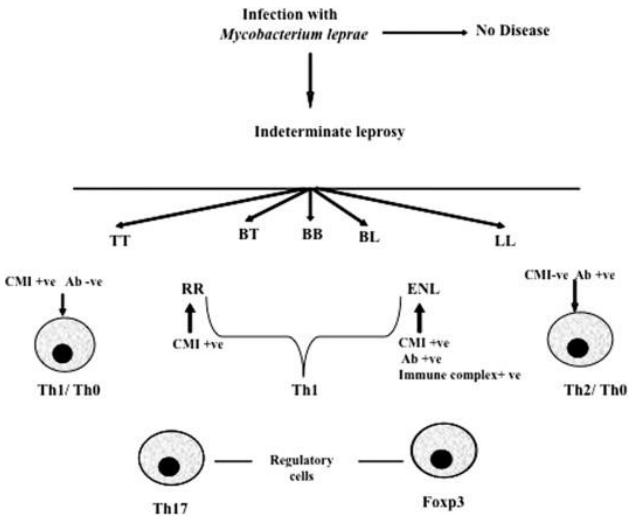

Figure 1. Immunological features of the leprosy spectrum (Ridley Jopling Classification)[15].

Figure 1 shows the immunological features of the leprosy spectrum based on the Ridley-Jopling Classification. The different types of leprosy along the spectrum are represented, including polar tuberculoid (TT), borderline tuberculoid (BT), borderline (BB), borderline lepromatous (BL), and polar lepromatous (LL) leprosy. The figure also shows the occurrence of leprosy reactions and their relationship to bacillary load. Type 1 or Reversal reactions (RR) and Type 2 or erythema nodosum leprosum reactions (ENL) are indicated. These reactions can occur during leprosy and lead to inflammatory responses.

The immunological features depicted include different T helper cell subsets. Th1 represents T helper 1 cells, Th2 represents T helper 2 cells, Th0 represents T helper 0 cells, and Th17 represents T helper cells producing interleukin 17 (IL-17). The figure also includes Foxp3, which represents T cells with the nuclear forkhead box 3 transcription factor. These different cell types play a role in the immune response and can have varying effects on leprosy progression and the development of reactions. Additionally, the figure indicates T cell-mediated immunity (CMI) and the presence of antibodies (Ab) in leprosy. These immune factors are important in understanding the immune response to Mycobacterium leprae, the bacterium that causes leprosy.

Although a significant portion (62%) of the Morbus Hansen type (a term used for leprosy) was not recorded, the distribution of leprosy classifications based on the Ridley-Jopling criteria was as follows: borderline tuberculoid (BT) accounted for 14% (3 cases), borderline lepromatous (BL) accounted for 19% (4 cases), and lepromatous (LL) accounted for 5% (1 case). These percentages represent the recorded cases within the study or dataset being referenced. It's important to note that the unrecorded cases may have

varied classifications and could impact the overall distribution if known (Table 4).

One of the useful aspects of this classification is that it recognizes that the polar forms of leprosy (TT and LL) are clinically stable, meaning they tend to progress slowly and have less tendency to develop complications. On the other hand, the borderline forms (BT, BL, and BB) have a higher propensity to develop reactions, which are inflammatory episodes that can cause significant damage to tissues and nerves. By understanding the different forms of leprosy along this spectrum, researchers can better assess the severity of the disease and predict the likelihood of reactions or complications. This classification system helps in guiding appropriate treatment strategies and monitoring the progression of the disease in affected individuals.

Table 5 provides information on the disease duration of squamous cell carcinoma (SCC) arising from Morbus Hansen (leprosy) patients. The table shows the number of cases within specific duration ranges, ranging from 4 to 30 years. There was one case each for the durations of 4, 12, 27, 28, and 30 years, and two cases for 29 years. The average disease duration for SCC arising from Morbus Hansen patients was calculated to be 23 years.

Table 6 presents the comorbidities associated with SCC arising from Morbus Hansen patients. The table includes the comorbid classifications, the number of cases reported for each comorbidity, and the corresponding percentages. Among the comorbidities observed, diabetes accounted for 21% (3 cases), anemia for 28% (4 cases), hypertension for 36% (5 cases), and tuberculosis for 14% (2 cases). These findings indicate the presence of various comorbid conditions in patients with SCC arising from Morbus Hansen, with hypertension being the most prevalent comorbidity reported.

The data study provides a comprehensive overview of various aspects related to squamous cell carcinoma (SCC) arising from Morbus Hansen (leprosy) patients, including gender classification, age distribution, body mass index (BMI) classification, leprosy spectrum classification, disease duration, and comorbidities. While the data might be limited in its generalizability as it specifically pertains to SCC cases arising from Morbus Hansen patients and may not be representative of the general population or other populations with SCC.

Overall, while the data provides valuable insights into various aspects of SCC arising from Morbus Hansen patients, it is important to consider these limitations when interpreting and applying the findings. Further research with larger sample sizes and more comprehensive data collection would enhance the validity and generalizability of the results.

CONCLUSION

This study investigated squamous cell carcinoma (SCC) in patients with Morbus Hansen (leprosy) and made important findings. They found that SCC cases were more common in males (86%) compared to females (14%). The study also revealed that the risk of SCC increased with age, particularly in the 46-55 and 56-65 age groups. The study found that a significant proportion of patients had a normal weight, while the occurrence of overweight and obesity was relatively low.

Additionally, the study used the Ridley-Jopling classification system to categorize different types of leprosy, providing insights into disease severity, prediction of complications, and treatment strategies. The study also explored the duration of SCC in Morbus Hansen patients, with an average disease duration of 23 years. Comorbidity analysis identified various associated

conditions, with hypertension being the most prevalent comorbidity.

ACKNOWLEDGMENTS

The authors thank the Department of Plastic Reconstructive and Aesthetic Surgery, Dr. Sitanala Central Hospital, Tanggerang, Indonesia for their support in this study.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this study.

FUNDING DISCLOSURE

None.

AUTHOR CONTRIBUTION

The study was designed and approved by FV. The manuscript was initially drafted by SP and later revised by FV and SP for important intellectual content. Furthermore, all authors carefully reviewed and approved the final version of the manuscript.

REFERENCES

1. World Health Organization. Global leprosy update, 2017: reducing the disease burden due to leprosy. Wkly Epidemiol Rec. 2018;35(93):445–56.
2. World Health Organization. Global leprosy (Hansen disease) update, 2019: time to step-up prevention initiatives. Wkly Epidemiol Rec. 2020;36(95):417–440.
3. Lastória J & de Abreu M. Leprosy: a review of the epidemiological, clinical, and etiopathogenic aspects – Part 1. A Bras Dermatol. 2014;89(2):205-18
4. Richardus J & Smith T. Squamous cell carcinoma in plantar ulcers in leprosy. A case-control study. Lepr Rev.1993; (64) 270-274
5. Nassaji H. Qualitative and descriptive research: Data type versus data analysis. Language Teaching Research. 2015;19(2):129-132.
6. Kemenkes Republik Indonesia. Profil Kesehatan Indonesia 2019. 2020
7. Nuttall F. Body Mass Index Obesity, BMI, and Health: A Critical Review. Nutrition Today. 2015;50(3):117-128.
8. Ridley D, Jopling W. A CLASSIFICATION OF LEPROSY FOR RESEARCH PURPOSES. Leprosy Review. 1962;33(2).
9. Aggarwal R, Ranganathan P. Study designs Part 2 – Descriptive studies. Perspect Clin Res 2019;10:34-6.
10. Seretis A, Cividini S, Markozannes G, Tseretopoulou X, Lopez D, Ntzani E, et al. Association between blood pressure and risk of cancer development: a systematic review and meta-analysis of observational studies. Scientific Reports. 2019;9(1).
11. Tsamara FR, Brigitta SR, Setiawan A., and Sugiharto S. Limb amputation in squamous cell carcinoma patient with a history of leprosy. Science Midwifery, 2023;10(6):4837-4844. DOI: 10.35335/midwifery.v10i6.1117.
12. Kemenkes RI. (2018). Hapuskan Stigma dan Diskriminasi Terhadap Kusta. InfoDATIN Pusat Data dan Informasi KEMENTERIAN KESEHATAN RI.
13. Hannan M, Notobroto HB, Hargono R, Hidayat S, Afiyah RK, & Hasina SN. The effect of health worker support and self-efficacy on the self-care agency of lepers in Indonesia. International Journal of Health Sciences, 2022; 6(3):1240–1248. DOI: 10.53730/ijhs.v6n3.11988
14. Ridley DS, Jopling WH.Classification of leprosy according to immunity. A five-group system. Int J Lepr Other Mycobact Dis, 1966;34:255-273

15. Nath I, Saini C, & Valluri VL. Immunology of leprosy and diagnostic challenges. Clinics in Dermatology,2015; 33(1):90–98.DOI:10.1016/j.clindermatol.2014.07.005