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Characteristic of Herpes Zoster in the Elderly at Prof. Dr. I.G.N.G. Ngoerah General Hospital: An Epidemiologic Study

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ABSTRACT

Background: Herpes zoster is a disease caused by the reactivation of the latent varicella zoster virus. Herpes zoster is the most common infection found in the elderly population. Epidemiologic data on herpes zoster infection among the elderly population in Bali remain limited. **Purpose:** The purpose of this study is to evaluate the characteristics of herpes zoster infection in elderly patients in order to provide clinical decision-making related to the management and prevention of herpes zoster in the elderly. **Methods:** This study uses a retrospective descriptive and gets its information from the medical records of herpes zoster patients at the Dermatovenereology Polyclinic at Prof. Dr. I.G.N.G. Ngoerah General Hospital from January 2019 to June 2022. The study population consisted of patients aged 60 years or older who were diagnosed with herpes zoster and received treatment at the polyclinic during the study period. **Result:** This study found that 33 elderly patients were diagnosed with herpes zoster. The age group 60-69 years found the most herpes zoster, with 18 (54.6%) patients and 17 (51.5%) male patients. The elderly patients had more comorbidities, which are 22 (66.7%) patients, with the majority having cancer, 7 of 22 patients (31.8%). The thoracic dermatome affected 13 patients (39.4%), multidermatome involvement affected 16 patients (48.4%), and post-herpetic neuralgia affected 22 patients (66.7%). **Conclusion:** This study found that elderly herpes zoster patients were mostly in the age group of 60-69 years, had cancer comorbidities, and involved multidermatomes.

Keywords: herpes zoster, elderly, comorbidity.

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BACKGROUND

Herpes zoster is an infectious disease caused by the reactivation of latent varicella zoster virus in the sensory ganglion. The immune response to prevent varicella zoster virus reactivation determines the incidence of herpes zoster.[1] Epidemiologic data also show that herpes zoster infection increases with age. Herpes zoster infection is the most common infection in the elderly or geriatric population. The elderly are the leading risk factor for herpes zoster infection. Through 2011–2013, the Indonesian Herpes Study Group found that there were 2,231 herpes zoster patients in 13 teaching hospitals in Indonesia. The age group 45–64 had the most cases (851), making up 37.95% of all herpes zoster cases. There were also 593 cases of post-herpetic neuralgia, making up 26.5% of all herpes zoster cases, with the age group 45–64 having the most cases of post-herpetic neuralgia (250), making up 42% of all post-herpetic neuralgia cases.[2] It is estimated that worldwide, there are at least 1.5 million new cases of herpes zoster, of which more than half are aged ≥60 years. Moreover, the number will increase dramatically with increasing age.[3]

Herpes zoster infection in the elderly population usually results in more severe symptoms and more frequent complications, such as post-herpetic neuralgia. In addition, in the elderly population, there is a decrease in the immune system, called immunosenescence. In immunosenescence, there is a dysfunction of cellular immunity, namely a decrease in the number and function of T cells that respond to varicella zoster virus, which in the elderly population

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increases with age.[4–6] Early diagnosis and effective treatment are essential for acute treatment, limiting disease progression, limiting disease duration, reducing the risk of pain and skin damage, preventing complications of herpes zoster, and improving patient quality of life. There are limited recent epidemiologic studies on herpes zoster infection in the elderly population in Bali. There have been no recent studies sampling elderly herpes zoster patients. Based on this background, the author is interested in evaluating the characteristics of herpes zoster infection in elderly patients at Prof. Dr. I.G.N.G. Ngoerah General Hospital Denpasar. It is hoped that this study can provide charateristic of herpes zoster infection in the elderly population in Bali so that this research data can be used for clinical decision-making related to the management and prevention of herpes zoster in the elderly.

METHODS

This study employed a retrospective descriptive research design. Research subjects data came from the medical records of herpes zoster patients at the Dermatovenereology Polyclinic at Prof. Dr. I.G.N.G. Ngoerah General Hospital, Denpasar, Bali, from January 2019 to June 2022. The population sample in the study was obtained from the population that met the inclusion criteria, namely subjects with herpes zoster diagnoses aged ≥ 60 years and conducting treatment at the Polyclinic of Prof. Dr. I.G.N.G. Ngoerah General Hospital during the study period and did not meet exclusion criteria which is unavailability of data according to the research variables needed in the patient's medical record. The Ethics Committee at Prof. Dr. I.G.N.G. Ngoerah General Hospital has reviewed this research.

RESULT

Based on research conducted at the Dermatovenereology Polyclinic of Prof. Dr. I.G.N.G. Ngoerah General Hospital from January 2019 to June 2022, 33 elderly patients were diagnosed with herpes zoster. In 2019, 4 patients (12.1%); in 2020, 5 patients (15.2%); in 2021, 10 patients (30.3%); and in 2022, 14 patients (42.4%).

Most patients were male, 17 (51.5%), and 16 (48.5%) were female. The elderly group based on age was 60-69 years old, with 18 (54.6%) patients, followed by 70-79 years old, with 11 (33.3%) patients, 80-89 years old, with 4 (12.1%) patients, and more than 90 years old, with 0 (0%) patients (Table 1).

Table 1. Characteristics of herpes zoster subjects in the elderly at Prof. Dr. I.G.N.G. Ngoerah General Hospital

Variable	Total	Frequency (%)
Year		
2019	4	12.1%
2020	5	15.2%
2021	10	30.3%
2022	14	42.4%
Gender		
Male	17	51.5%
Female	16	48.5%
Age (Years)		
60-69	18	54.6%
70-79	11	33.3%
80-89	4	12.1%
≥90	0	0%

Based on dermatome involvement, the majority of patients were affected in the thoracic dermatome 13 (39.4%), followed by cervical 8 (24.2%), lumbar 6 (18.2%), trigeminal 2 (6.1%), ophthalmic 2 (6.1%), thoracic + cervical 1 (3%), and lumbar + ophthalmic 1 (3%). The number of dermatomes involved were multidermatome 16 (48.4%), unidermatome 15 (45.5%), and duplex multidermatome 2 (6.1%) patients.

Table 2. Dermatome involvement of herpes zoster subjects in the elderly at Prof. Dr. I.G.N.G. Ngoerah General Hospital

Variable	Total	Frequency (%)
Dermatome Involvement		
Thoracic	13	39.4%
Cervical	8	24.2%
Lumbar	6	18.2%
Trigeminal	2	6.1%
Ophtalmic	2	6.1%
Thoracic + Cervical	1	3%
Lumbar + Ophtalmic	1	3%
Number of dermatomes		
Multidermatome	16	48.4%
Unidermatome	15	45.5%
Duplex Multidermatome	2	6.1%

Based on comorbidities, 22 (66.7%) patients had comorbidities, and 11 (33.3%) did not. Of the total 22 patients who had comorbidities, 7 (31.8%) had cancer, 6 (27.3%) had hypertension, 4 (18.2%) had diabetes mellitus, 2 (9.1%) had heart disease, autoimmune diseases (systemic lupus erythematosus and psoriasis

vulgaris) 2 (9.1%), and pulmonary tuberculosis 1 (4.5%).

Table 3. Type of comorbidities of herpes zoster subjects in the elderly at Prof. Dr. I.G.N.G. Ngoerah General Hospital

Variabel	Total	Frequency (%)
Comorbidities		
Yes	22	66.7%
No	11	33.3%
Type of Comorbidities		
Cancer	7	31.8%
Hypertension	6	27.3%
Diabetes Mellitus	4	18.2%
Heart Disease	2	9.1%
Autoimmune Diseases	2	9.1%
Pulmonary Tuberculosis	1	4.5%

Elderly patients who have post-herpetic neuralgia complications are 22 (66.7%) patients, post-inflammatory hyperpigmentation 2 (6.1%) patients, bacterial infection 2 (6.1%) patients and 7 (21.2%) patients do not have post-herpetic neuralgia complications (Figure 1).

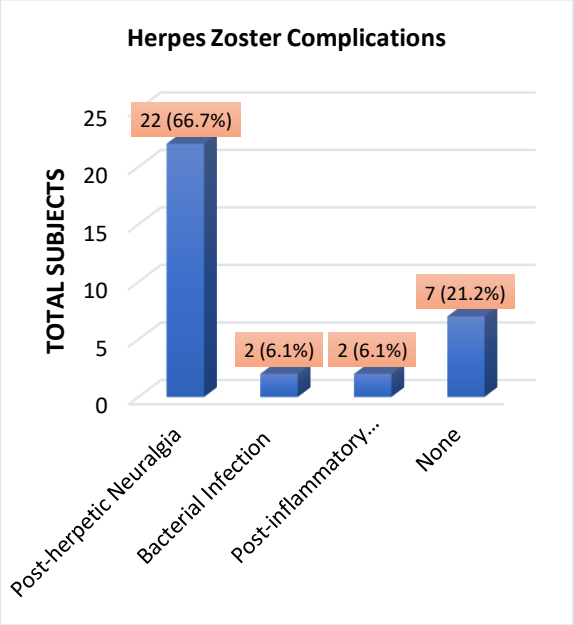

Figure 1. Herpes zoster complication in the elderly at the Prof. Dr. I.G.N.G. Ngoerah General Hospital.

DISCUSSION

In this study, the samples taken were all elderly patients with a clinical diagnosis of herpes zoster who came for treatment at the Dermatovenereology Polyclinic of Prof. Dr. I.G.N.G. Ngoerah General Hospital from January 2019 to June 2022 based on medical records where 33 elderly patients were diagnosed with herpes zoster. In 2019 there were 4 patients (12.1%), in 2020 there were 5 patients (15.2%), in 2021 there were 10 patients (30.3%), and in 2022 there were 14 patients (42.4%).

There are several hypotheses regarding the relationship of seasonal patterns on the incidence of herpes zoster, with some reports claiming an increase in herpes zoster cases during the summer while others claim there is no significant correlation to seasonal patterns. Many of these studies conclude that seasonal patterns in herpes zoster may be related to ultraviolet light exposure, with higher ultraviolet light intensity in the dry season or hotter season affecting the reactivation of the varicella-zoster virus.[7,8] In this study, different results were obtained where elderly patients with herpes zoster were found most in the rainy season with 22 (66.7%) patients and in the dry season only 11 (33.7%) patients. This can be attributed to a decrease in cellular immunity associated with an increased risk of cellular immunity depression in elderly patients with weather changes during the rainy season. This is consistent with a study by Herning et al., which found that the incidence of herpes zoster increased during the rainy season.[9]

In several studies, the proportion of female patients ranged from 55.9% to 64%. It is not known precisely why it is more common in women, but in general, women seek treatment for their disease more often than men and have more contact with their varicella-infected children. This tendency of the female population to seek medical assistance could lead to a statistical increase. However, this was not the case in this study, where most patients were male. There were 17 (51.5%) male and 16 (48.5%) female patients.

The incidence of herpes zoster increases with age, where more than 2 out of 3 of cases occur at the age of more than 50 years. There are an estimated 1.5 million new cases of herpes zoster in the United States each year, half of which are in the elderly population aged ≥ 60 years. In this study, it was found that the elderly group based on age was 60-69 years, as many as 18 (54.6%) patients, followed by 70-79 years, as many as 11 (33.3%) patients, 80-89 years as many as 4 (12.1%) patients, and more than equal to 90 years as many as 0 (0%) patients. The age group of 60-69 years in this

study was found to have the highest proportion compared to other age groups, as many as 18 (54.6%). This is in accordance with the literature which states an increase in herpes zoster in old age. In addition, aging also causes a decrease in cellular immunity, which is the main factor causing reactivation.[2]

Another risk factor is decreased cell-mediated immunity. Immunocompromised patients have a significantly greater risk of developing herpes zoster infection than immunocompetent individuals in the same age group. The prevalence of herpes zoster in immunodeficient patients is estimated at 10%. Based on comorbidities, 22 (66.7%) patients had them, and 11 (33.3%) did not. Of the total 22 patients who had comorbidities, 7 (31.8%) patients had carcinoma, 6 (27.3%) had hypertension, 4 (18.2%) had diabetes mellitus, 2 (9.1%) had heart disease, autoimmune diseases (systemic lupus erythematosus and psoriasis vulgaris) 2 (9.1%), and pulmonary tuberculosis 1 (4.5%).[6]

There have been many studies on the association between herpes zoster and the risk of cancer. In 2017, a systematic review and meta-analysis of 46 previous studies reported that the relative risk for any cancer was 1.42 during the entire period of each study and 1.83 at one year of herpes zoster diagnosis. Kuan et all also reported that the overall incidence of herpes zoster was 2.29-fold higher in adults with any cancer than in those without cancer (1.27 versus 0.56 per 100 person years 95% CI, 2.16–2.42). Cancer and its treatments often lead to decreased immune function, making individuals more susceptible to infections like herpes zoster. This immunocompromised state can result from the cancer itself or the treatments, such as chemotherapy or radiation therapy. In addition, the psychological stress associated with a cancer diagnosis may further compromise immune responses, facilitating the reactivation of the varicella zoster virus, which causes herpes zoster.[10,11]

Herpes zoster is generally distributed unilaterally in one dermatome. The thoracic dermatome is the most common dermatome affected by herpes zoster, followed by the cervical and trigeminal regions. In some patients, herpes zoster may extend to more than one dermatomal region, resulting in multidermatomal involvement. This multidermatomal distribution often occurs in immunocompromised conditions such as human immunodeficiency virus infection, the presence of malignancies, and chemotherapy. Some cases have been noted to occur in conditions of viremia such that widespread spread can also lead to multidermatomal involvement.[12] Duplex multidermatomal distribution occurs in two separate dermatomes. This type of distribution is scarce, with an incidence of less than 0.1% of all herpes zoster cases. Multidermatomal duplex distribution of lesions has been reported to occur in elderly people with a generalized immunocompromised state due to advanced age.[13] In this study, thirteen of the patients (39.4%) were affected in the thoracic dermatome, eight in the cervical (24.2%), six in the lumbar (18.2%), two in the trigeminal (6.1%), two in the ophthalmic (6.1%), and one in the thoracic + cervical (3%). The number of dermatomes involved was multidermatomal in 16 (48.4%), unidermatomal in 15 (45.5%), and duplex multidermatomal in 2 (6.1%) patients.

One of the most disturbing complications of herpes zoster is post-herpetic neuralgia. Post-herpetic neuralgia is a condition of persistent pain in the affected dermatome three months after the herpes zoster eruption has disappeared. The incidence of post-herpetic neuralgia ranges from about 10 to 40 of herpes zoster cases.[4] Post-herpetic neuralgia patients will complain of continuous pain (burning, aching, throbbing), intermittent pain (throbbing), and pain triggered by stimuli such as allodynia (pain triggered by normal stimuli such as touch). The risk of post-herpetic neuralgia increases at over 50 years, which is 27 times.[14] In addition, the elderly typically experience more prolonged or severe prodromal pain, broader and longer-lasting skin eruptions, or more intense pain. In this study, pain scale measurements were obtained using a visual analogue scale score, the predominant score was 4, reported by 15 patients (45.5%). Subsequently, visual analogue scale 3 was reported by 8 patients (24.2%), visual analogue scale 5 by 6 patients (18.2%), and visual analogue scale 6 by 4 patients (12.1%).

Bacterial infection is the second most common complication after post-herpetic neuralgia. Streptococcal and/or staphylococcal infections of skin lesions are common in herpes zoster. Superinfection with group A Streptococcus has a worse prognosis. Cutaneous bacterial infection of herpes zoster lesions may occur due to oligoclonal differentiation of these virus-specific T cells. Bacterial infection of these virus-specific T cells significantly impacts ganglion inflammation, leading to post-herpetic neuralgia and bacterial infection.[15,16] Viral infection can generate a localized cutaneous immune response and establish the presence of hyperpigmentation. Post-inflammatory hyperpigmentation is the presence of hyperpigmented lesions due to skin inflammation. Post-inflammatory hyperpigmentation is more likely to occur in

Fitzpatrick skin types III-VI that are more common in the Asian population.[17] Skin lesions with poorer prognosis are associated with larger lesion areas, which means a more significant viral load and more severe inflammation associated with lung or brain complications. Viral particles in dermal dendritic cells of skin lesions have been shown to affect post-inflammatory hyperpigmentation formation, reduce normal function, and cause scar formation.[18]

In this study, 22 (66.7%) had complications of post-herpetic neuralgia, 2 (6.1%) post-inflammatory hyperpigmentation, 2 (6.1%) and 7 (21.2%) had no complications of post-herpetic neuralgia. Complications of post-herpetic neuralgia have a higher incidence in patients with comorbid diseases. The influencing factors were patients with immunocompromised. Skin lesions caused by herpes zoster may be more severe, require more prolonged healing, and have a lower recovery rate. Comorbidities also influence the presence of more post-herpetic neuralgia states. Hyperglycemia may affect the healing of skin lesions in patients with herpes zoster through mechanisms such as immune system disorders, microvascular damage, and microcirculation disorders in the capillaries.[18,19]

Advancing age combined with immunodeficiency conditions may result in reactivation of the varicella zoster.[20] This study concludes that the majority of herpes zoster patients, aged 60–69, have cancer, multidermatome involvement, and post-herpetic neuralgia. Elderly patient with comorbidity may increase a higher incidence of complication such as post-herpetic neuralgia, potentially leading to decrease the quality of life. Optimal treatment strategies are needed for reducing the morbidity of herpes zoster infection, especially in elderly patients. Studies involving larger numbers of patients are needed to report more clearly the clinical features and morbidities in elderly patients with herpes zoster.

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