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CHARACTERISTICS OF MELASMA PATIENTS IN DERMATOLOGY AND VENEREOLOGY POLYCLINIC NGOERAH HOSPITAL DENPASAR BALI FROM 2020 TO 2022

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ABSTRACT

Background: Melasma is a common hypermelanosis condition caused by sun exposure. Melasma causes lack of self-confidence which affects quality of life. This research is to determine the prevalence and characteristics of melasma patients at Dermatology and Venereology Polyclinic, Ngoerah Hospital, Denpasar, Bali. **Method:** Research method using cross sectional descriptive observational study at Dermatology and Venereology Polyclinic and Medical Records Installation in February until May 2024. **Result:** Total of 69 (6.56%) new patients diagnosed with melasma, 67 (97.10%) female patients and 2 (2.90%) male patients and predominantly aged 41-50 years in 40 (57.97%) patients. Total of 50 (72.25%) patients had family history of melasma, 43 (62.32%) patients exposed to sunlight > 2 hours/day, 45 (65.72) patients used hormonal contraception, 2 (2.90%) patients had cysts ovary. The dominant type of melasma was centrofacial in 47 (68.27%) patients with epidermal depth in 47 (68.11%) patients. Umbrella were dominant as photoprotection in 35 (50.09%) 69 (100%) patients used sunscreen. **Conclusion:** The ratio of melasma in men: women is 1:34 and dominant at age 41-50 years. Risk factors include family history, sun exposure, and contraception. Centrofacial type with epidermal depth, umbrella as photoprotection found to be dominant.
Keywords: Melasma; Characteristic; Cross sectional.

INTRODUCTION

Melasma is the most common hypermelanosis disease and is usually found on the part of the body that are most exposed to sunlight, especially the face.[1] The pigmentation is symmetrical, usually affecting the cheeks, forehead and nose. Melasma is associated with sun exposure, hormones, use of certain drugs, use of cosmetics, and genetic factors.[2,3]Melasma is more common in adult women of productive age, between the ages of 30 to 55 years, but can also occur after menopause. Melasma in men occurs in only 10% of cases.2 Melasma has a clinical picture of light to dark brown macules with irregular edges, usually involving the forehead, temples, cheeks, nose, above the lips, chin, and sometimes affecting the neck. Its location which is often on the face causes lack self-confidence which affects the patient's quality of life. In melasma, increased melanocyte cells or increased melanin pigment are found. Melasma often affects Fitzpatrick III-VI skin types, which are more common in people with Asian or Hispanic races who live in tropical areas which exposed to high level of UV rays, causing hyperpigmentation disorders in the form of melasma.[4,5]

In the United States, an estimated 5-6 million people suffer from melasma. The prevalence rate in 2007 showed that melasma occurred in 8.8% of women living in the United States, and 40% of women living in Southeast Asia. According to Febrianti et al., the prevalence of melasma at Dr. Cipto Mangunkusumo Hospital, Jakarta in 2004 was 2.39%, with a percentage of female patients of 97.93%, and only 2.07% in male patients. Melasma is often considered a cosmetic disease, so people prefer to go to a private doctor's practice rather than a hospital. Therefore, it is very possible that the actual incidence is higher than reported.[6,7]This study was conducted to determine the characteristics of melasma patient undergoing outpatient treatment at Dermatology and Venereology Polyclinic, Ngoerah Hospital, Denpasar, Bali in January 2020 to December 2022 in order to provide appropriate management and prevention education to reduce losses and their impact on quality of life.

MATERIAL AND METHODS

This study is a descriptive observational study with a cross-sectional design conducted at the Dermatology and Venereology Polyclinic and Medical Records Installation of Ngoerah Hospital, Denpasar, Bali. The study was conducted for 3 months in February-May 2024. The population consisted of all patients with a diagnosis of melasma who underwent treatment at the Dermatology and Venereology Polyclinic, Ngoerah Hospital, Denpasar, Bali. The sample was then selected based on the established criteria. The sampling technique in this study used the total sampling method from medical records from the accessible population. Data collection

was carried out by checking medical records and patient registries. After the data was collected, the data was tabulated in the form of a table and grouped descriptively. Numerical data will be presented in the form of mean ± standard deviation or median ± minimum-maximum value. Categorical data will be presented in the form of frequency and percentage.

RESULT

The results showed that the number of patients who came to the Dermatology and Venereology Polyclinic, Ngoerah Hospital, Denpasar, Bali on the period of January 2020 until December 2022 was 1,051 patients, with 69 (6.56%) new patients diagnosed with melasma.Based on gender, new melasma patients were 67 (97.10%) female patients and 2 (2.90%) male patients. Based on age, 22 (31.88%) patients were aged 30-40 years, 40 (57.97%) patients were aged 41-50 years and 7 (10.35%) patients were over 50 years (Table 1).

Based on the risk factors suspected on influencing the onset of melasma in new patients are genetic factors, sunlight, contraception and drugs. Based on genetic factors, 50 (72.25%) patients had a family history of melasma and 19 (27.75%) patients had no family history of melasma. Based on sun exposure, 43 (62.32%) patients had sun exposure for more than 2 hours per day and 26 (37.68%) patients had sun exposure for less than 2 hours per day. Based on hormonal factors, 45 (65.72%) patients had hormonal contraception, 11 (15.76%) patients had non-hormonal contraception, 1 (1.45%) patient had hormonal drugs, and 12 (17.07%) patients didn't use contraception and hormonal drugs. Based on medical history, 2 (2.90%) patients had gynecological disorders (ovarian cysts). Based on melasma type, 47 (68.27%) patients had centrofacial type, 22 (31.73%) patients had malar type and there were no patients with mandibular type. Based on Wood's lamp examination, the results were obtained in 47 (68.11%) with epidermal type melasma, 6 patients with dermal type melasma (8.70%) and 16 (23.19%) patients with mixed type melasma. Dermoscopy examination showed a regular reticular pigment pattern of homogeneous dark brown in 73 (66.98%) epidermal type melasma patients, an irregular reticular pigment pattern of faded brown to bluish gray in 8 (7.34%) dermal type melasma patients, and a regular and irregular reticular pigment pattern of dark brown to bluish gray in 28 (25.68%) mixed type melasma patients.

Table 1. Characteristics of Melasma Patients Based on Gender, Age, Family History, Sun Exposure, Contraceptives or Hormonal Drugs and Gynecological or Thyroid Disorders, Type and Depth of Lesions.

Characteristics	Number	%
Gender		
Male	2	2.90
Female	67	97.10
Age		
30-40 years old	22	31.88
41-50 years old	40	57.97
> 50 years old	7	10.35
Family History		
Yes	50	72.25
No	19	27.75
Sun Exposure		
> 2 hours per day	43	62.32
< 2 hours per day	26	37.68
Contraseption/ Hormonal Medication		
Hormonal Contraception	45	65.72
Non-hormonal Contraception	11	15.76
Hormonal Medication	1	1.45
Without contraception/ hormonal medication	12	17.07
Gynecological abnormalities/ Thyroid disease		
Gynecological abnormalities (Ovarian cysts)	2	2.90
Melasma Type		
Centrofacial	47	68.27
Malar	22	31.73
Depth of Lesions		

Epidermal	47	68.11
Dermal	6	8.70
Mixed	16	23.19

Based on the use of photoprotection, 35 (50.09%) patients used umbrella, 31 (45.11%) patients used sunscreen and 3 (4.80%) patients used hat. Based on melasma treatment, each patient received combination therapy. All patients received sunscreen, with 39 (56.52%) patients received chemical peeling with glycolic acid (GA), 84 (75.36%) patients received 52 Kligman formula, 1 (1.45%) patient given triple combination therapy (TCT) consisting of hydroquinone (HQ) 2%, tretinoin 0.025%, flucinolone 0.05% topical, 2 (2.90%) patients received topical tretinoin, 1 (1.45%) patient given oral tranexamic acid, 3 (4.35%) patients received light-based therapy using Q-Switched (QS) laser and Super Skin Rejuvenation (SSR) and 1 (1.45%) patient given topical antioxidants.

Table 2. Characteristics of Melasma Patients Based on The Use of Photoprotection and Treatment.

Use of Photoprotection	**Number**	**%**
Umbrella	35	50.09
Sunscreen	31	45.11
Hat	3	4.80
Treatment		
Sunscreen	69	100
Chemical peeling (Glycolic acid)	39	56.52
Topical Kligman's Formula	52	75.36
Topical Hydroquinone 2% + Tretinoin 0.025% + Fluocinolone 0.05% Topical Tretinoin	1	1.45
	2	2.90
	1	1.45
Oral Tranexamic Acid	3	4.35
Light-based Therapy (laser QS, SSR)		
Topical Antioxidant	1	1.45

DISCUSSION

Melasma is a skin disease characterized by chronic cutaneous hypermelanosis with hyperpigmentation in areas of the face that are often exposed to sunlight. The term melasma comes from Greek which means "black", which was previously called chloasma. Hypermelanosis is irregular, symmetrical, uneven macules with light to dark brown color. Melasma can be found on the forehead, temples, cheeks, nose, chin, and above the lips.[1,8]Epidemiologically, melasma is usually found in dark-skinned races (Fitzpatrick skin type IV-VI), but all racial groups can also experience melasma. People who live in areas with tropical climates are more likely to suffer from melasma. Melasma is a very common disease, around 0.2-4% patients seek treatment at clinics for melasma in Southeast Asia.[9] The prevalence of melasma is still unknown. The comparison of melasma cases between men and women in Indonesia is 1:24.[10]According to research by Rahman et al. in 2007, of 167 patients who underwent skin examinations, 40.7% were melasma sufferers, and 62.3% occurred in women aged 13-60 years, which was caused by the use of cosmetics with a duration of use of 3 months to 11 years. To determine the epidemiological pattern and risk factors, a study was conducted on 321 cases in 2011, which stated that the average age of melasma patients was around 24-54 years. The ratio of women to men is 4:1. As many as 55.12% of patients had their condition worsened due to sun exposure. Of the 250 female patients, 56 were pregnant, 46 were using contraceptive pills, and 34 others experienced worsening of melasma during pregnancy. In 104 cases, patients were also found to have genetic factors for melasma.[11,12]

Although melasma has many recognized etiological factors, its exact pathogenesis is unknown. Evidence suggests that internal and environmental factors may be responsible for triggering, maintaining, and recurrence of melasma lesions. These factors include genetic influences, UV radiation exposure, pregnancy, oral contraceptives, estrogen/progesterone therapy, thyroid dysfunction, cosmetics, and medications such as anticonvulsants and phototoxic agents.[13,14]Genetic predisposition is considered to be one of the major causes that influence the development of melasma, although there has been no report that genetics is the definite cause of melasma. Epidemiological study data show that there are differences in race and family history of patients with melasma. Several studies have stated that 55-64% of patients with melasma have a positive family history.[13,1]

The clinical manifestation of melasma is in the form of hyperpigmented skin in the cheek, forehead, and mandible areas. Based on the clinical manifestations on

the face, melasma is classified into three, namely centrofacial which includes the forehead, cheeks, nose, upper lip and chin (63%), malar (cheekbone) which includes the cheek and nose areas (21%), and mandibular which includes the mandibular ramus area (16%). Based on the wood's lamp examination, melasma is classified into epidermis, dermis, and mixed type.[8,14]Diagnosis of melasma can be done by conducting history taking and physical examination. Examination using a Wood's lamp is performed to determine the localization of pigmentation.[2,8,14]On physical examination, lesions will be seen in the form of hyperpigmented macules, irregular, and symmetrical distribution on the face. The three most common distribution patterns are centrofacial which affect the cheeks, forehead, nose, above the lips, and chin. The number of hyperpigmented macules can be single or multiple, and the lesions tend to be symmetrical.[2,8] On the histopathological picture of melasma based on pigmentation, it is divided into epidermal, dermal, and mixed. Epidermal type melasma has an increase in the amount of melanin in the basal and suprabasal layers which causes the skin to become brownish. In contrast to the epidermal type, dermal type melasma will look bluish gray. Compared with dermal melasma, epidermal melasma will be more responsive to treatment.[2,14]Based on wood's lamp examination, it is divided into three types, namely, epidermal, dermal, and mixed types. The epidermal type looks light brown, the dermal type looks bluish gray, and the mixed type looks dark brown.[8,14]

Melasma treatment requires a long period of time, regular control and good cooperation between the patient and the doctor. Most patients seek treatment for cosmetic reasons. Medication and skin care must be carried out regularly and perfectly because melasma is chronic and easily recurs in nature. The principle of melasma treatment is to prevent melanogenesis. Melasma treatment consists of topical and systemic agents. Topical therapy consists of depigmenting agents, retinoids, corticosteroids, tranexamic acid, UV protection, and combination creams. The mechanism of action of these topical drugs is to degrade melanosomes, tyrosinase inhibitors, melanosome transfer inhibitors, and to increase keratocyte cell turnover. Prevention of the onset or worsening and recurrence of melasma is protection from sun exposure. Patients are required to avoid direct exposure to ultraviolet rays, especially between 9 am unti 3 pm. It is better to use an umbrella or wide-brimmed hat when going out, and protect the skin by using the right sunscreen. The use of sunscreen is recommended 30 minutes before sun exposure.[15,16] Another important treatment for melasma is eliminating factors suspected of causing melasma, for example stopping the use of contraceptive pills, stopping the use of colored or perfumed cosmetic products, avoiding the use of drugs, for example hydantoin, cytostatic drugs, antimalarial drugs, and minocycline.[8,15]

In this research, the melasma profile observed was based on gender, age, family history, sun exposure, history of contraception or hormonal drugs, gynecological disorders, lesion location, lesion depth, use of photoprotection, and overall therapy based on medical records in a predetermined period. The results of this study showed that the majority of patients were women (97.10%). This is in accordance with existing literature that melasma is more often observed in women than men of the same age. Generally, the female dominance is 9-10:1. However, the prevalence ratio of women to men varies greatly, ranging from 4:1 to 39:1. The reason for the difference in risk of women and men for melasma is still unknown, but there are many things that may be the cause such as higher morbidity rates in women so that more women come to treat melasma and cause more women to be recorded, but this has not been proven. Judging from other risk factors, namely the use of cosmetics, pregnancy, and the use of injectable contraceptives, only women experience it.[17,18]

Based on age, the largest age group is 41-50 years, followed by the age group 30-40 years. Melasma has a variable age of onset. The mean age of onset ranges from 20 - 30 years in some studies to 36 - 40 years in other studies. Melasma has been shown to develop earlier in life in patients with lower phototypes. The delay in the onset of melasma has been attributed to the photoprotective role of melanin. Mandibular melasma is particularly associated with a later onset compared to other types. In one study, women aged 20 to 35 years constituted more than half of the patients. In another study, 87 (87%) women were aged 20 - 40 years. Similarly, in studies from India and Singapore, the mean age of development of melasma was 30 and 34 years, respectively.[19,20]

Several risk factors observed in this study were family history, sun exposure, and history of contraception. UV radiation from the sun causes lipid peroxidation of cell membranes, producing free radicals that trigger keratinocytes to release cytokines including α-Melanocyte Stimulating Hormone (α-MSH) which increases melanogenesis in melanocytes. Accumulation of chronic sun exposure can also cause melasma. This is evidenced by the discovery of increased solar elastosis in melasma lesions compared to the surrounding normal skin, indicating a process of sun damage. One of them is the activation of fibroblasts as evidenced by increased expression of Stem Cell Factor (SCF) in the dermis, which affects the occurrence of hyperpigmentation in the epidermis above it. Hormonal influences are said to be important factors triggering melasma besides sunlight. Hormonal influences can be in the form of pregnancy, hormonal contraception, ovarian tumors, ovarian or thyroid dysfunction, and hormonal therapy.[21-23]

The most common type of melasma found in this study was centrofacial (68.27%) and malar (31.73%). Based on epidemiological studies in various countries, the most common clinical pattern is centrofacial type, followed by maxillary melasma and mandibular melasma. These results were also observed in various studies in India, Brazil, and Indonesia. Similar observations were reported from Tunisia, where the most common type was centrofacial melasma, accounting for 76.1% of all cases,

followed by malar melasma (22.9%) and mandibular melasma (1%).[20,24,25]

Routine use of broad-spectrum sunscreen is effective in preventing melasma and enhancing the effects of other topical medications in melasma treatment. This study also reviewed the treatment of melasma carried out at the Dermatology and Venereology Polyclinic, Ngoerah Hospital, Denpasar, Bali. In this study, the most widely used therapy was the Kligman's formula. According to Rendon, the modified Kligman's Formula (HQ 2% + retinoic acid 0.05%, + dexamethasone 0.1%) has a level and quality of evidence IIIC, not as good as the triple combination. The Kligman's formula that was widely given to patients in this study is the most commonly used combination therapy for melasma. The combination of HQ, retinoids and topical steroids has high effectiveness in the treatment of melasma. This combination is effective because retinoids prevent HQ oxidation and increase epidermal penetration, while steroids reduce irritation of the other two ingredients and reduce cellular metabolism, thereby inhibiting melanin synthesis.[26,27]

CONCLUSION

The incidence of melasma cases at the Dermatology and Venereology Polyclinic, Ngoerah Hospital, Denpasar, from January 2020 to December 2022 was 69 cases. The melasma profile based on gender between men and women was 1:34. The most common age group was 41-50 years old. Based on risk factors, namely family history, sun exposure, and history of contraception were found in this study. Based on the type of melasma, centrofacial type dominated at 68.27%, with the greatest lesion depth was epidermal at 68.11%. The highest percentage of photoprotection use was umbrella (50.09%), followed by sunscreen (45.11%). Sunscreen was given to all patients and combined with other therapies, such as chemical peeling and Kligman's formula.

Ethical Considerations

The study has received approval from the ethical comitee.

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Conflict of Interest

All authors have contributed in every stages of this research. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. The authors declare no conflict of interest.

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