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Melasma characteristic in hormonal contraceptive acceptors at Kelurahan Mangga Kecamatan Medan Tuntungan, Medan-Indonesia



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ABSTRACT

Background: Melasma is one of the most common skin problems in dermatology. Areas often exposed to ultraviolet, especially the face as a predilection of its disorder. The etiology of melasma remains unknown. There are several risk factors considered to play a role in the pathogenesis of melasma, one of them is the hormone, especially those contained in hormonal contraceptives.

Aim: To know the characteristic of melasma related hormonal contraceptive acceptors in Kelurahan Mangga Kecamatan Medan Tuntungan, Medan.

Methods: This was a cross-sectional descriptive study which involved 83 subjects with hormonal contraceptive acceptors in Kelurahan Mangga Kecamatan Medan Tuntungan, Medan. Diagnosis of melasma was made based on history, clinical features and by Wood's lamp examination. The data obtained is processed and presented in tabulation form.

Results: In this study, the proportion of melasma in hormonal contraceptive acceptors was 17 subjects (20.5%). The proportion of melasma in oral contraceptive acceptors was 6 subjects (26.1%),

injection of 7 subjects (19.4%), implant 4 subjects (16.7%). Based on the hormonal contraceptive content, the proportion of melasma contains estrogen and progesterone was 11 subjects (23.4%) and progesterone alone 6 subjects (16.7%). Based on duration of hormonal contraceptive use melasma was found during 6-12 months in 2 subjects (11.7%), 13-24 months in 1 subjects (5,9%), 24-36 months in 4 subject (23,5%), >36 months in 10 subject (58,8%). Based on the type of clinical pattern that is centrofacial type in 9 subjects (52,9%), malar in 8 subjects (47,1%). Based on Wood's lamp is epidermal type in 16 subjects (94.1%), dermal type in 1 subject (5,9%).

Conclusions: In hormonal contraceptive acceptors was obtained proportion of melasma 20,5% with oral contraception by 26.1%, 19.4% injection and 16.7% implant. Proportion of melasma contains estrogen and progesterone was 23.4%. Duration of hormonal contraceptive use, melasma was found at most more than 36 months in 58,8%. The most commonly found clinical pattern that is centrofacial type in 52,9% and based on Wood's lamp is epidermal type in 94.1%.

Keywords: melasma, hormonal contraceptive acceptors

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INTRODUCTION

Melasma is one of the most common problems in dermatology.¹ The predilection site for this disorder is the area that is often exposed to Ultraviolet (UV), especially the face. Melasma has a disturbing effect on appearance, leading to a decrease in confidence, especially the deterioration of the quality of life.^{2,3} Etiology of melasma is certainly unknown. There are several risk factors that are considered to play a role in the pathogenesis of melasma, including UV exposure, hormones, drugs, genetics, races and cosmetics ingredients.⁴ Hormones play a role in the pathogenesis of melasma, estrogen, and progesterone have an impact in melasma development, because melasma is common in pregnancy, hormonal contraceptive use, estrogen therapy in prostate cancer patients and conjugate estrogen use in women after menopause.⁵ In facts, melasma is

an undesirable skin effect on contraceptive use hormonal.⁶ This can be seen in histopathologic examinations that show increased expression of estrogen receptors on melasma-treated skin.⁷

Hormonal contraceptives are methods or contraceptives containing a combination of synthetic estrogens and progesterone or synthetic progesterone similar to natural hormones in a woman's body. Hormonal contraceptives are indicated to prevent pregnancy and present in pill, injections, and implants.⁸ Hormonal contraceptives have several side effects which are melasma.⁸ A study by Ortonne et al. regarding the role of UV and hormone enhancement in development of melasma among 324 patients, reported that 42% melasma patients were associated with pregnancy history, and 25% of 171 peoples due to hormonal contraceptives acceptors.⁹

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Table 4.1 Distribution of melasma in hormonal contraceptive acceptors

	Melasma		Without melasma	
Hormonal Contraceptive Acceptors	17 (20.5%)		66 (69.5%)	
Contraceptive Types				
Oral contraception	6	(26.1%)	17	(73.9%)
Injection	7	(19.4%)	29	(80.6%)
Implant	4	(16.7%)	20	(83.3%)
Contraceptive Composition				
Estrogen & progesterone	11	(23.4%)	36	(76.6%)
Progesterone	6	(16.7%)	30	(83.3%)

Table 4.2 Distribution of melasma based on the duration of use

Duration of usage(month)	Contraceptive types					
	Oral		Injection		Implant	
< 6	0	0	0	(0.0%)	0	(0.0%)
6 – 12	1	(5.9%)	0	(0.0%)	1	(5.9%)
13 – 24	0	(0.0%)	1	(5.9%)	0	(0.0%)
25 – 36	0	(0.0%)	3	(17.7%)	1	(5.9%)
> 36	5	(29.4%)	3	(17.7%)	2	(11.8%)

Table 4.3 Distribution of melasma by clinical pattern type and Wood's lamp

	n	%
Clinical Pattern Type		
Centrofacial	9	52.9
Malar	8	47.1
Mandibular	0	0
Wood's Lamp		
Epidermal	16	94.1%
Dermal	1	5.9%
Mixed	0	0
Unclear	0	0

METHOD

This is descriptive observational research with cross sectional approach. The sample is a group of hormonal contraceptive acceptors in Kelurahan Mangga Kecamatan Medan Tuntungan, Medan, Indonesia involving 83 subjects were taken by using consecutive sampling method. The inclusion criteria are the hormonal contraception acceptors who are willing to participate in this study and sign the informed consent. Subject with a family history of melasma, thyroid disorders and history using drugs that are phototoxic and photoallergic were excluded. On the subjects of data recording, anamnesis, and clinical examination. Samples with melasma will be examined using Wood's lamp to

see melasma type. Data analysis was done descriptively and result presented in table form.

RESULTS

Eighty-three subjects of hormonal contraceptive acceptors have been observed in Kelurahan Mangga Kecamatan Medan Tuntungan, Medan.

Based on [table 4.1](#), the proportion of melasma in hormonal contraceptive acceptors was found in 17 subjects (20.5%) and 66 subjects (79.5%) without melasma. Based on hormonal contraceptive types, the distribution of melasma most common in oral contraceptives (26.1%), followed by injection (19.4%) and implants (16.7%). Hormonal contraceptives contain estrogen and progesterone

more frequently caused to melasma (23.4%) than progesterone only (16.7%).

In [Table 4.2](#) based on duration of hormonal contraceptive use we found the onset of melasma rise in 10 (58.9%) subjects which use more than 36 months, 6 subjects (23.6%) use 25-36 months, 1 subject (5.9%) use 13-24 months, 2 subjects (11.8%) use 6-12 months. We did not find the risk of melasma when hormonal contraceptive used below 6 months.

From 17 patients hormonal contraceptive acceptors with melasma, we found centrofacial type in 9 subjects (52.9%), which was the most common type, followed by the malar type in 8 subjects (47.1%) and mandibular type was not found. The most common melasma type by Wood's lamp examination is epidermal type in 16 subjects (94.1%), dermal type in 1 subject (5.9%). ([Table 4.3](#)).

DISCUSSION

Melasma can be found all over the world, especially people who live in tropical areas that always exposed to the UV. This hyperpigmentation disorder can affect all races and often occurs in people with Hispanic and Asian races which have skin type Fitzpatrick III-V.1

In this study, the proportion of melasma in hormonal contraceptives acceptors found in 17 subjects (20.5%) as can be seen in [table 4.1](#). Suhartono's study characteristics of melasma in hormonal contraceptive acceptors in 125 subjects, the result 57 subjects (31.3%) rise melasma due to the use of hormonal contraceptives.¹⁰ Ortonne et al. found a smaller value than this study, in 324 subjects with melasma obtained 171 subjects (53%) used hormonal contraceptives at some stage, and 25% of the 171 peoples claimed that the onset of melasma occurred after hormonal contraceptives use.⁹ Furthermore, in a study by Ikino et al. in Brazil found that the risk factors for melasma result from hormonal contraceptives use are smaller than this study, of where 51 subjects with melasma, 5 subjects (9.80%) associated with hormonal contraceptive.³

[Table 4.1](#) represents from 83 subjects whom application hormonal contraceptives, only 23 subjects used oral contraceptives, this result less than injection and implant, but the incidence of melasma the higher compared with injection and implants which is 26.1 %. The results of this study consistent with Suhartono's study in Semarang which also shows that oral contraceptives acceptors less than injection or implants, but the incidence of melasma due to the oral contraceptives is higher compared with other hormonal contraceptives (35.5%).¹⁰ Guinot et al. in Tunisia found that oral

contraceptives were reported as an aggravating factor in 38% of melasma.¹¹ Handel et al. showed a lower number, from 207 subjects found at 10% of melasma due to oral contraceptives.² The incidence of melasma due to hormonal contraceptives, especially oral contraceptives was also found lower results in Tamage et al. and Achar et al. studies, with 16.2% and 18.4%, respectively.^{12,13}

Hormonal contraceptives contain estrogen and progesterone is more frequently leads to melasma than progesterone alone in 11 subjects (23.4%). Estrogen and progesterone play a role in the development of melasma, which hormonal contraceptives use caused estrogen and progesterone imbalance. Estrogen increases vascularization of the skin and suppresses the activity of sebaceous glands. Estrogen also increases pigment cell activities.¹⁴ Progesterone increase the spread of melanin in cells and the expression of PR proteins in skin hyperpigmentation due to melasma.^{15,16} Wiedemann et al. concluded that progesterone derivatives in oral contraceptives might reduce the risk of melasma based on the finding that progesterone reduces proliferation without a significant effect on tyrosinase activity, in contrast to the effects of estrogen stimulation on melanocyte cultures.¹⁷ This probably causes a lower incidence of melasma due to hormonal contraceptives containing progesterone alone.

[Table 4.2](#) shows the onset of melasma based on the duration of hormonal contraception is the most more than 36 months of 10 subjects (58.9%). A study by Ortonne et al. found that the onset of melasma after hormonal contraceptives use was 25%, but it was not explained how long the time was.⁹ Suhartono's study found that melasma occurred after oral contraceptive use, injection and implant more than 20 months.¹⁰ Guinot et al. showed a significant association between severity of melasma and duration of oral contraceptive use; melasma often occur between 1 to 3 years after its use.¹¹

Centrofacial type is the most common clinical pattern seen in hormonal contraceptive acceptors in 9 subjects (52.9%) ([table 4.3](#)). Centrofacial is the most common type, which is 63% covering forehead area, nose, medial cheeks, below the nose and chin.² This study is similar to Krupashankar et al. that found 45% on centrofacial and 39% on malar.¹⁸ Guinot et al. also found centrofacial type frequently encountered in the study, which was 76%, malar 23%, and mandibular 1%.¹¹ This result is different from Jagannathan et al. that shows the distribution of melasma in 80 women obtained that malar 65%, centrofacial 26.25%, and mandibular 8.75%.¹⁹ The result same as Pawar et al., of 120 patients with melasma, all subjects (100%) showed melasma

distribution at malar area, with 76 subjects (63,33%) on forehead and 16 (13,33%) on chin.²⁰ The most common melasma type by Wood's lamp examination is epidermal type 94.1%. This study is in similar with Jagannathan et al. that found epidermal type 48.75%, dermal 20%, mixed 28.75% and 2.5% unclear.²⁰ Reddy et al. also show that epidermal type is 47%, dermal 34% and mix 20%.²¹ Wood's lamp with 320-450nm wavelength can be used to determine into the melanin on the skin. On Wood's lamp examination, epidermal types of melasma will appear more clearly than light.²²

Estrogens have a significant effect on many different cell types in skin physiology, including keratinocytes, fibroblasts, and melanocytes. Progesterone increases the spread of melanin in cells. Although the pathogenesis of melasma has not been fully understood. But melasma considerably has some risk factors influential in addition to hormones contained in hormonal contraceptives such as genetic, races, UV exposure, thyroid dysfunction, drugs and cosmetics ingredients.^{1,4,6,9}

The limitations of this study are the number of samples are still small and the area of research that is only in one kelurahan (district). It is necessary to conduct further multicenter research with a large sample size in order to describe the proportion of melasma in hormonal contraceptive users in Indonesia

CONCLUSION

The proportion of melasma in hormonal contraceptive acceptors is 20,5%. Where the highest result rise the melasma in a subject who used oral contraceptive, hormonal contraceptives contain estrogen and progesterone and duration more than 36 months. The type of melasma is centrofacial type and epidermal type. In the future, multicenter research needs to be done with a large sample size in order to be able to describe the proportion of melasma in hormonal contraceptives acceptors in Indonesia, as well as to explore the use of hormonal contraceptives (oral, injection and implants) with melasma.

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CONFLICT OF INTEREST

The authors declared that they have no conflicts of interest

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