

**HORMONAL EVALUATION IN FEMALES HAVING MELASMA**Sharique Ali<sup>1</sup>, Suraj Bali<sup>2</sup>, R. P. Sharma<sup>3</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT: BACKGROUND:** Melasma is a commonly acquired hyperpigmentation which present as irregular, light to dark brown macules on sun exposed skin due to various etiological factors including hormonal imbalance. **AIM:** To assist the level of various hormones and study the clinical and hormonal correlation in patients of melasma. **METHODS:** 50 female patients of melasma between age group 18-50 with equal number of age matched females with no signs of melasma, hirsutism and any other endocrinal abnormality, were enrolled. They were examined by woods' lamp to see the type of melasma whether epidermal, dermal or mixed. 10 ml of venous blood sample was drawn after overnight fasting on 3<sup>rd</sup>- 5<sup>th</sup> day of the menstrual cycle in mid follicular phase for the assessment of LH, FSH, Prolactin, Estradiol and Progesterone by chemiluminescence method. **RESULT:** Out of 50 patients, 8 patients had deranged level of LH, 7 patients had deranged level of FSH, 14 patients had deranged prolactin, 18 patients had deranged estradiol and 6 patients had deranged level of progesterone. 70% patients were married and belong to age group of 31-40 years. 18 % patients has onset of melasma during pregnancy while 52% patients after the delivery. **CONCLUSIONS:** LH, estradiol and progesterone are found to be contributory factors in development of melasma.

**KEYWORDS:** Melasma, Estradiol, Progesterone, LH, FSH, Prolactin.

**INTRODUCTION:** Melasma is an acquired hyperpigmentation which presents as irregular, light to dark brown macules on sun exposed skin. The most common sites are cheeks, forehead, temples, upper lip, nose and rarely anterior chest and dorsum of forearm.<sup>1,2</sup> The lesions are usually irregular, confluent or punctate and are symmetrically distributed. It is more prevalent in dark complexion individuals with skin types IV to VI, Ninety percent of the patients are women. The disease is more common in people of Hispanics; Orientals & Indo-Chinese origin who live in location that receives high intensity ultraviolet radiation,<sup>3</sup> however, all races can be affected. It is a common condition in India but its exact population based incidence has not been documented so far,<sup>4</sup> The three patterns of melasma which are recognized clinically are: centrofacial (61%, the most common type), malar (21%) and mandibular (16%).<sup>5</sup> Melasma has also been divided into three types based on Wood's lamp and histopathological examination as: Epidermal (70%), dermal (10%) and mixed (20%).<sup>6</sup> The exact cause of melasma is yet to be determined, however, many causative factors have been implicated and these include: exposure to UV radiation and visible light,<sup>7</sup> genetic influences, pregnancy oral contraceptives and hormone replacement therapy, ovarian tumors and cosmetics.<sup>6</sup> The hormonal imbalances due to mild ovarian dysfunction in women have also been reported.<sup>8,9</sup> Further, autoimmune thyroiditis and thyroid dysfunction have also been documented<sup>10</sup>. Some of the drugs which have been implicated are anticonvulsants & photosensitizing agents.

**METHODS:** The study was carried out over a period of one year in the department of dermatology LLRM medical college Meerut.

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50 female patients of melasma between age group 18-50 years, with equal number of age matched female with no signs of melasma, hirsutism and any other endocrinal abnormality were enrolled, after getting approval from the ethical committee of institution and a written informed consent.

The pregnant, lactating or patients on any hormonal therapy (OCP) were excluded from the study. Patients suffering from any other pigmentary disorder, any endocrinopathy and patients with history of alcohol abuse, any drug known to exacerbate melasma i.e. phenothiazines and anti-epileptics, were also excluded.

A detailed history and clinical examination of each patient was carried out. The personal data like family history of melasma, marital status, age of onset, occupation, duration of sun exposure, use of drugs and cosmetics and effect of seasonal variation was recorded. Patient's skin type, area and extent of involvement of melasma were also noted. Woods lamp examination was performed to see the type of melasma. The result of routine investigations (Complete blood and urine examination, RBS, renal and hepatic profile) was recorded.

10ml. of the venous blood sample was drawn after overnight fasting on 3<sup>rd</sup>-5<sup>th</sup> day of the menstrual cycle in the mid follicular phase for the assessment of LH, FSH, Prolactin, Estradiol and progesterone by chemiluminescence method.

**Statistical Analysis:** The data were collected and transferred to STATA version 17 and analyzed accordingly. Student 't' test and mann whitney U test were used to compare the mean and to find out the significance of difference. A 'p' value <0.05 was considered significant.

**RESULTS:** Out of 50 patient's, 35(70%) were married. Thirty (60%) belongs to age of 31-40years, 16(32%) were of 18-30 years and Four (8%) were in the range of 41-50 year. The mean age of presentation was 32.8±6.28 years. Regarding Occupation there were 28(56%) housewives and 22(44%) were professionals. All the patients had regular menstrual cycles.

In married patients, nine (18%) patient had onset of melasma during pregnancy while 26(52%) patients developed after the delivery. Family history was present in only 13(26%) patients. Thirty (60%) patients had a duration of sun exposure per day in the range of 1-3hrs, followed by the patients who spent about <1hr in the sun per day (22%).

There were 42% patients reported no seasonal variation while 52% patient complain of exacerbation of melasma during summer while 6% reported increase during winter season.

There were 25 cases of epidermal melasma followed by 24 mixed and 1 case of dermal type with a percentage of 50%, 48% and 2% respectively. The malar and centrofacial pattern was observed in equal proportion i.e. 50%.

The majority of patients (72%) has melasma area severity index (MASI) <10 and ranged between 2.7 to 20. The mean MASI was 8.98±4.20.

The levels of luteinizing hormone were deranged in 16% patients. Three (6%) out of 50 patients with melasma had increased level while five (10%) patients had decreased level of LH. The mean±S.D. of control were 4.67±1.17 & of cases was 3.83±2.22. The LH levels and its association with melasma was significantly different from controls (P<0.0001). table 1,2 and fig.1c.

There were six (12%) patients had increased levels of FSH while only one patient had decreased level. The FSH level and its association with Melasma were not significantly different from the controls (P> 0.05).fig. 1d.

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Fourteen (28%) had deranged level of prolactin but its levels and association with melasma was not significantly different from the controls ( $p > 0.05$ ).fig 1e

There were fifteen (30%) patients had decreased level of estradiol while three (6%) patients had increased level and the difference was significant with controls ( $P < 0.0001$ ).fig 1a same as estradiol progesterone levels was also deranged in 6(12%) patients and its association with melasma was also significantly different from the controls ( $P < 0.001$ ).fig 1b

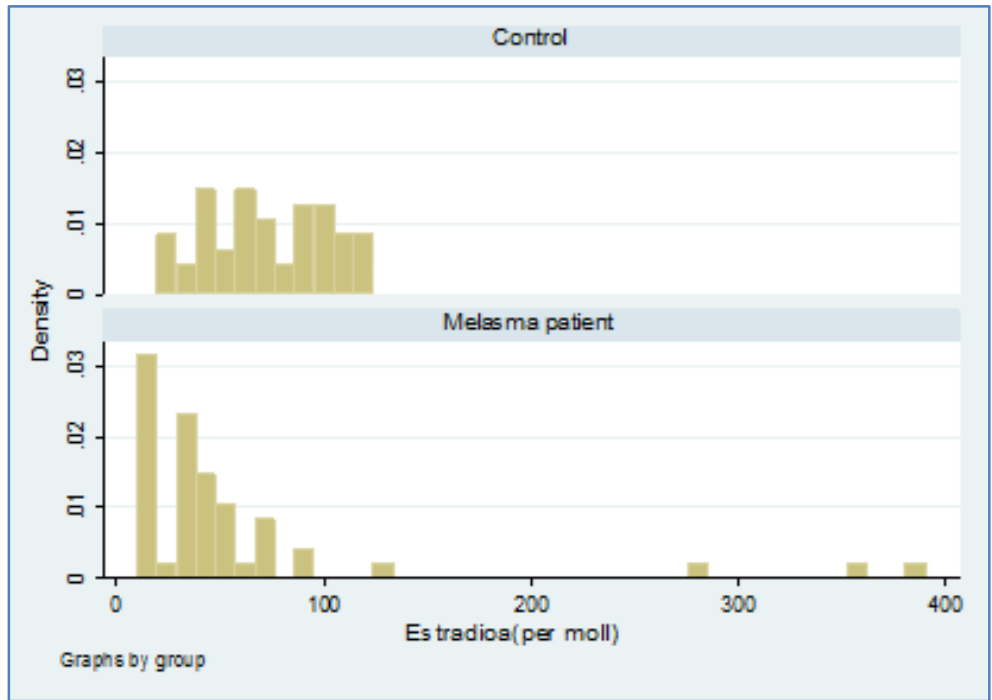
Hormones	Decreased level (No. of Patients)	Normal level (No. of Patients)	Increased level (No. of Patients)
LH	5	42	3
FSH	1	43	6
PROLACTIN	4	36	10
ESTRADIOL	15	32	3
PROGESTERONE	1	44	15

Table 1

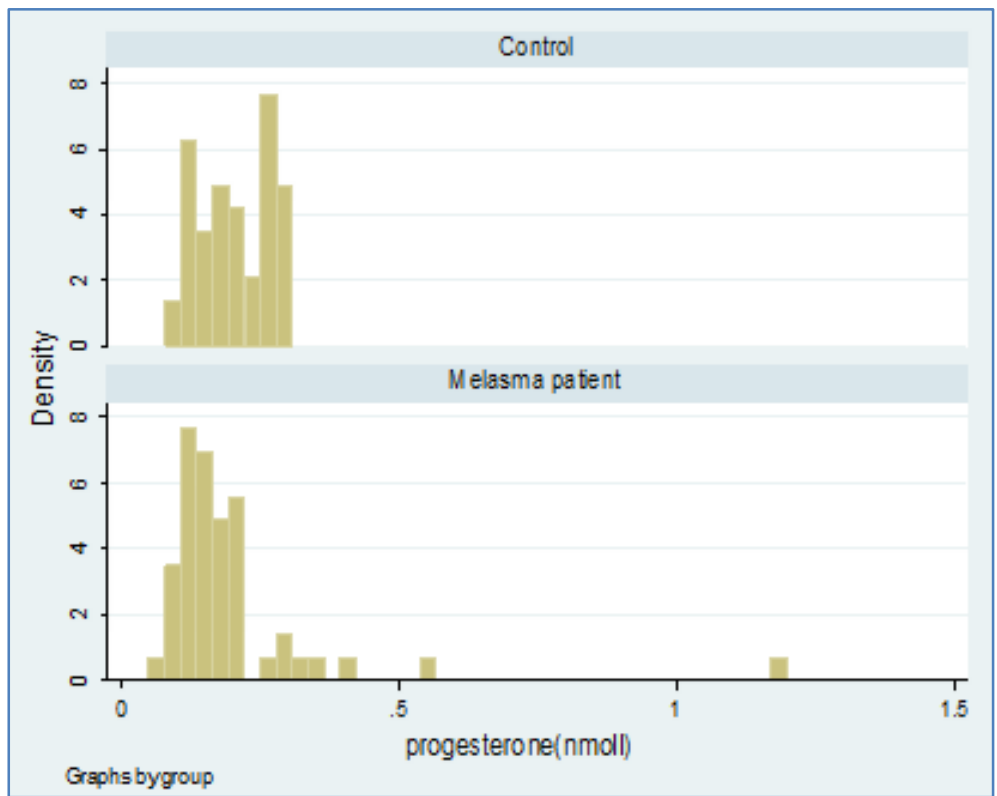
Parameters	Controls (n=50) mean $\pm$ SD	Cases (n=50) Mean $\pm$ SD	P value
Estradiol	72.44 $\pm$ 29.19	56.91 $\pm$ 77.56	0.000**
Progesterone	0.20 $\pm$ 0.66	0.19 $\pm$ 0.16	<0.014**
LH	4.67 $\pm$ 1.17	3.83 $\pm$ 2.2	<0.0001**
FSH	5.65 $\pm$ 1.51	5.75 $\pm$ 4.48	0.0598
Prolactin	16.78 $\pm$ 6.47	17.96 $\pm$ 18.28	0.079

Table 2: Comparison of hormones between cases and controls

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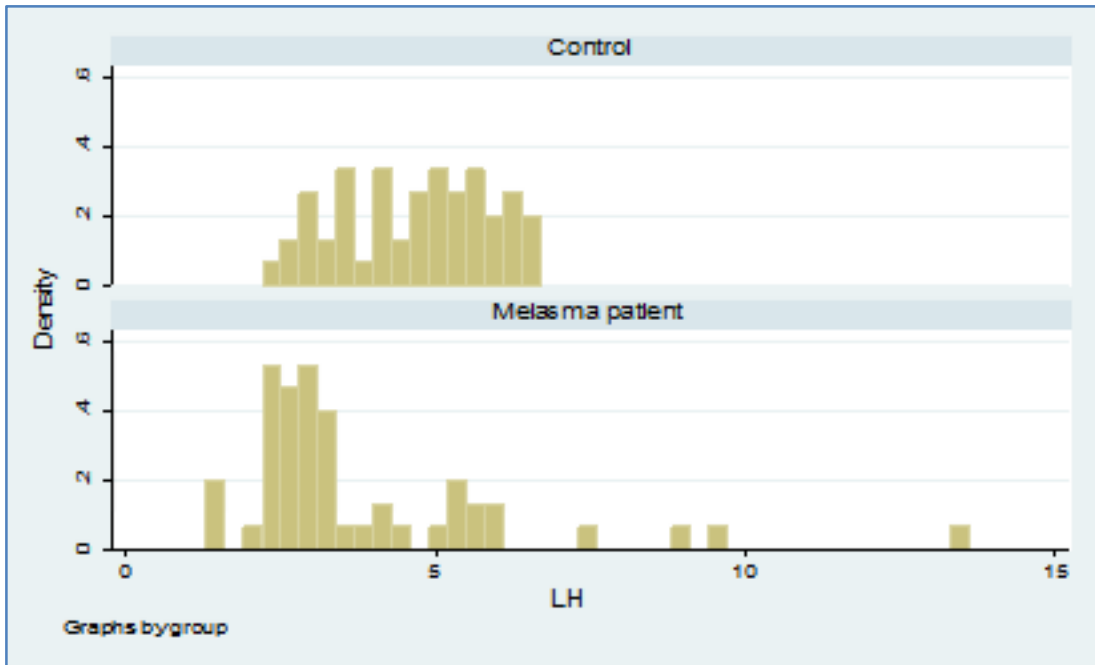


**Fig. 1A**

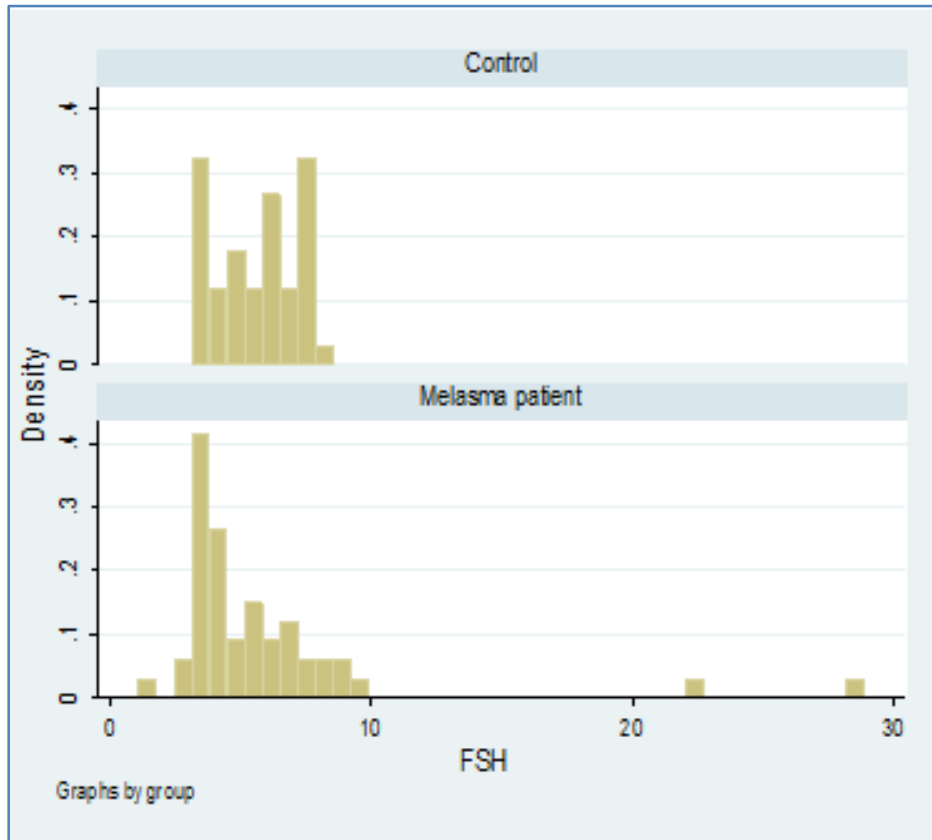


**Fig. 1B**

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**Fig. 1C**



**Fig. 1D**

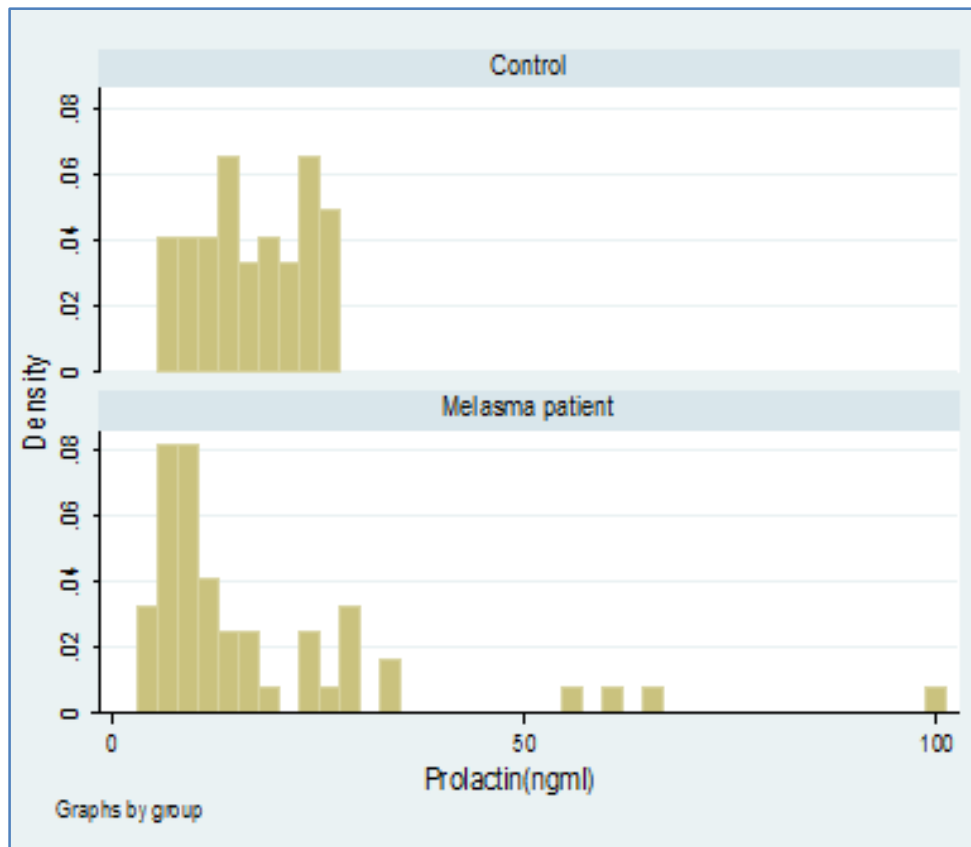


Fig. 1E

**DISCUSSION:** The exact cause of melasma is uncertain but a direct relationship with female hormonal activity appear to be significant because it commonly occurs in pregnancy and with the use of oral contraceptive pills.<sup>10</sup> Other factors implicated in etiopathogenesis are exposure to sunlight,<sup>7,8</sup> photosensitizing medications,<sup>6</sup> mild ovarian or thyroid dysfunction<sup>10</sup> and certain cosmetics.

In the present study, majority of patient had an age range of 31-40 with a mean age of  $32.8 \pm 6.28$  year which is in accordance with other studies. The mean age of onset was  $28.2 \pm 6.2$ . 64% patients had melasma for 1 to 3 years only and surprisingly a very few studies have commented on duration of melasma. Kang et al,<sup>8</sup> reported 7 years as mean duration of melasma while lufti et al reported 3.7 years as average duration.

In our study 30% were unmarried who had melasma which is similar to other study. The duration of sun exposure was 1-3 hours in 60% of patients which is clearly seen as an important triggering factor in other studies also.<sup>11</sup> The UV exposure during summer months has been reported to produce induction or exacerbation of Melasma.

Centrofacial type was seen in 50% of patients in our study which is similar to other studies.<sup>7,8,11</sup> Epidermal melasma was the commonest variety seen which is also in accordance with other studies, while dermal type was the least common i.e. only one case which is nearly similar to the findings by perez et al.

Relationship of melasma with the level of hormones i.e. LH, FSH, prolactin, estradiol and progesterone was determined in mid follicular phase. Three patients showed increased level of LH

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when compared with normal range (2.39- 6.60 IU/L) which is similar to other studies.<sup>12,13,14</sup> Level of FSH was not significantly different from control group in our study which is similar to study of Perez<sup>14</sup> but Hassan et al,<sup>15</sup> found significantly increased level in day 7.

The level of Prolactin in study and control group was not found to be significantly different ( $P>0.05$ ), which is also seen similar in other studies,<sup>14</sup> but Hassan et al<sup>15</sup> when measured prolactin on day 9 of cycle revealed that prolactin was significantly decreased when compared to control group.

Measurement of 17  $\beta$  estradiol in 50 patients in our study revealed decreased levels in 15 patients which is in agreement with finding of perez et al while 3 patients showed increase levels which is similar to findings of Hassan et al. Over all in our study the association between estradiol levels and melasma was found to be statistically significant ( $P<0.001$ ). In our study one (2%) out of 50 patients with melasma had decreased and 5 patients had increased level of progesterone (normal level 0.1-0.3 n mol/L). There was significant decrease in progesterone level ( $P<0.001$ ) when compared with controls. Our finding is contradictory to those reported by perez et al and Hassan et al.

**CONCLUSION:** From the present study it is concluded that along with other etiologic factors like sun exposure, pregnancy drugs and weather conditions, hormones are also a major contributing factor in the causation of melasma specially estradiol, progesterone and LH. Knowing these facts, can help us in making strategy to plan effective management for melasma in female patients.

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