Scholars LITERATURE

La Prensa Medica Argentina

Research Article

DOI: https://doi.org/10.47275/0032-745X-307
Volume 107 Issue 1

Hyperpigmentation in Primigravida Pregnant Ladies in Relation to Fetal Gender

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Abstract

Background: Hyperpigmentation is the most common cutaneous manifestation in pregnancy due to elevated serum levels of melanocyte-stimulating hormones, estrogen, or progesterone. Estrogen increases the output of melanin by the melanocytes and the effect of estrogen is augmented by progesterone, resulting in melanin deposition into epidermal cells and dermal macrophages, clinically either generalized hyperpigmentation or more commonly areas that are already physiologically dark become more obvious such as areolas, nipples, genitalia, axillae, periumbilical area, and inner thighs. Linea nigra, melasma, and longitudinal melanonychia are also common with pregnancy. We aimed to assess the hyperpigmentation during pregnancy in the third trimester about fetus gender.

Methods: A cross sectional study and convenient sampling method included all primigravida ladies in the third trimester were carried out, 309 pregnant ladies were collected from Al-Kindy teaching hospital, Al-mustanseryah and Bab Al- muatham primary health care centres during period from first of September 2019 till 29th of February 2020. Direct interview were made with pregnant ladies and check list was fulfilled.

Results: There was no significant correlation between fetus gender and development of melasma and melanonychia in pregnant ladies with p values 0.426 and 0.074 respectively, while there was significant correlation between fetus gender and the development of linea nigra, hyperpigmentation of areolas and flexures and generalized pigmentation in pregnant ladies with male fetuses with p value 0.018, 0.001 and 0.001 respectively.

Conclusions: Hyperpigmentation was more in pregnant ladies with male fetuses than female fetuses.

Keywords: Hyperpigmentation; Pregnancy; Fetal; Gender

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Citation: Abdullah GA (2021) Hyperpigmentation in Primigravida Pregnant Ladies in Relation to Fetal Gender. Prensa Med Argent, Volume 107:1. 307. DOI: https://doi.org/10.47275/0032-745X-307.

Received: August 29, 2020; **Accepted:** September 12, 2020; **Published:** September 15, 2020; **Journal Issue:** February, 2021

Introduction

Pregnancy is a period in which more than 90% of women have significant and complex skin changes that may have great impact on the woman's life. Hyperpigmentation is most common presentation of pregnancy due to elevated serum levels of MSH, estrogen or progesterone. Estrogen increases the output of melanin by the melanocytes and the effect of estrogen is augmented by progesterone, resulting in melanin deposition into epidermal cells and dermal macrophages [1].

Upregulation of tyrosinase by human placental lipids may further potentiate melanin synthesis. Hyperpigmentation during pregnancy could be manifested either by increase pigmentation in areas that are already physiologically darker (areolas, nipples, genitalia, axillae, periumbilical and inner thighs) or pigmentations that appear only in pregnancy like melasma, linea nigra, and longitudinal melanonychia [2]. There is a traditional believe in our society that hyperpigmentation is more obvious if the fetus is male, so this study was done to confirm this believe.

Methods

Ethics and Consent

After prior approval from the Al-Kindy college of medicine, university of Baghdad, written informed consent taken from patients, the study was conducted.

Study Design and Settings

This is a descriptive cross-sectional study; data collection was carried out during the period from 1st of September 2019 till 29th of February 2020. The study was conducted in three centers: (1) Baghdad/Iraq at Al-Kindy teaching hospital, (2) Al- mustanserya primary health care centre (PHCC), and (3) Bab al-muatham primary health care centre (PHCC).

Study Population and Sampling Procedure

Convenient sampling of pregnant ladies seeking antenatal care services and treatment. The questionnaires were distributed to these ladies who met inclusion and exclusion criteria, and recollected for those who agreed to be recorded in this study. History and examination were performed for all ladies for the presence or absence of the following pigmentations:

1. Melasma
2. Longitudinal melanonychia

3. Linea nigra
4. Hyperpigmentation of the nipple, areola, and flexures (genitalia, axillae, periumbilical and inner thighs)
5. Generalized hyperpigmentation

Inclusion Criteria

1. primigravida in the third trimester
2. pregnant ladies with single foetus
3. pregnant ladies from all ages
4. pregnant with skin colour type 3&4 regarding (Fitzpatrick skin type)

Exclusion Criteria

1. Chronic medical disease
2. Chronic dermatological disease

Pilot Study

Before starting collecting data, an interview with 30 primigravida ladies to assess the applicability of the questionare and to find out any difficult or unclear questions and explore any technical difficulties.

Statistical Analysis

Collected data introduced to Excel sheet 2016 and loaded to SPSS version 24 programs used for statistical analysis. Descriptive studies were presented use table and graphs. Chi square test was used to find out the significance of association between different variables. P value less than 0.05 considered as cut-off point for discrimination of significance.

Results

A total number of 309 primigravida pregnant ladies were included in this study. Ultrasound examination was performed for all ladies and revealed that 57.6% had male fetuses while 42.4% had female fetuses.

The correlation between foetal gender and type of pigmentation is illustrated in table 1. Melasma was present in about 25.3% of pregnant ladies with male fetuses in comparison to 21.4% pregnant ladies with female fetus. P value was nonsignificant (0.426). Longitudinal melanonychia was present in 7.9% of pregnant with male fetuses and 3.1% of female fetuses with non significant p value (0.074). Linea nigra was obvious in 96.1% of pregnant ladies with male fetus in comparison to 90.6% of pregnant ladies with female fetus. P value was 0.018 which demonstrate a significant correlation between linea nigra and gender. Flexural and areolar hyperpigmentation was present in 85.4% male fetuses in comparison to 34.4% female fetuses, with a highly significant p value 0.001. Generalized hyperpigmentation was demonstrated in 42.1% of ladies with male fetuses while in 11.5% of female fetuses and p value was highly significant 0.001 (Table 1).

Table 1: Type of pigmentation in relation to foetal gender.

Type of Pig	Gender	Present		Absent		P-value
		number	%	number	%	
Melasma	**Male**	45	25.3	133	74.7	0.426
	Female	28	21.4	103	78.6	
Melanonychia	**Male**	14	7.9	164	92.1	0.074
	Female	4	3.1	127	96.9	
Linea Nigra	**Male**	172	96.6	6	3.4	0.018
	Female	118	90.1	13	9.9	
Flexural & Areola	**Male**	152	85.4	26	14.6	0.001
	Female	45	34.4	86	65.6	
Gener. Hyperpig	**Male**	75	42.1	103	57.9	0.001
	Female	15	11.5	116	88.5	

Discussion

Male fetuses have disproportionate rates of preterm births, higher birth weights and great foetal mortality [3,4]. Pregnancy is a physiological state characterized by profound immunologic, metabolic, endocrine and vascular changes, which make the pregnant woman more susceptible to skin changes [5].

Many areas of skin are turning darker appear as hyperpigmentation of nipples and the surrounding skin (areolas), flexors (neck, axilla, inner thigh, and genitalia), linea alba, melasma (mask of pregnancy), and also generalized hyperpigmentation [6].

To the best of our knowledge, this is the first study to confirm relationship between foetal gender and development of pigmentation in primigravida pregnant ladies. In this study pregnant ladies with male fetuses significantly had linea nigra, pigmentation of flexures and areola and generalized hyperpigmentation compared to those with female fetuses, while melasma and melanonychia were non significant. This can be explained by the fact that the hormonal and immunological changes among women carrying a male fetus had more increases in proinflammatory cytokines and proangiogenic growth factors levels, while these changes, among female fetuses have increases in the expression of the regulatory cytokines. This may explain the disparate pregnancy outcomes based on foetal gender and are consistent with our hypothesis that women carrying a male fetus would have a growth factor and cytokine milieu that is biased toward the Th1 inflammatory response compared to women carrying a female fetus. Women carrying a male fetus had higher levels of inflammatory cytokines at multiple time points during gestation. Specifically, male fetuses were associated with higher levels of IL-12p70 , IL-21, IL-33, and G-CSF in maternal plasma during pregnancy, with many of these proteins increased above females fetuses as early as 6 weeks post-conception [7]. These facts can explain why pregnant women with male fetus have more profound skin hyper pigmentations than those with female fetus.

Conclusion

Hyperpigmentation was more obvious in primigravida pregnant ladies with male fetuses than female fetuses.

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