

## CLINICAL STUDY OF PHYSIOLOGICAL SKIN CHANGES IN PREGNANCY

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### Abstract

**Background:** During pregnancy skin often changes dramatically because of the numerous metabolic, immunologic, and hormonal adjustments of this state. These changes are referred to as "physiologic" skin changes. They occur so regularly during pregnancy that they are considered almost normal, but they may become pathologic when severe. Physiological changes in pregnancy are at times mistaken for pathological changes. Recognizing these changes are important to avoid unnecessary trauma in females and testing. The aim to study the prevalence of physiological skin changes in pregnant women. **Materials and Methods:** 200 consecutive pregnant women attending the Department of Obstetrics and Gynecology were selected. Complete cutaneous examination was done in all cases to study all the physiological changes of skin and its appendages. Each patient was followed up till delivery. At follow up visit, each patient was examined clinically, new cutaneous findings were noted. **Result:** A total of 200 consecutive pregnant women attending the Department of Obstetrics and Gynecology in tertiary medical institute of south India were selected. This study was conducted in collaboration of department of Obstetrics and Gynecology and dermatology department. Of these, 93 females (46.5 %) were primi gravidas and 107 females (53.5 %) were multi gravidas. Most of them (173 cases, 86.5 %) were native of South India and majority belonged to skin type IV (79 cases, 70%) and V (182 cases, 30%). Most common physiological changes observed were mucosal changes (100%), pigmentary changes (86.5%), striae (73.5%), vascular changes (40%), glandular changes (39.5%), nail changes (23.5%) and hair changes (5.5%). **Conclusion:** Study enlighten about physiological skin changes in pregnancy in rural tertiary care hospital. Mucosal changes and pigmentary changes were the most common finding in our study.

## INTRODUCTION

Skin changes during pregnancy occurs due to multiple factors that could be due to metabolic, immunologic or hormonal factors. These changes leads to various physiological and pathological skin alterations, spanning from typical skin changes to eruptions that seem linked to pregnancy.<sup>[1]</sup> Furthermore, pregnancy can influence the progression of several dermatological conditions. These changes can lead to significant anxiety among women. This study was conducted in the rural tertiary care hospital to know the pattern & frequency of physiological skin changes in pregnant women pertaining to this geographical location.

### Aim and Objective

To study the prevalence of physiological cutaneous changes in pregnant women.

## MATERIALS AND METHODS

An observational cross-sectional study was conducted, which included 200 consecutive pregnant women attending the Department of Obstetrics and Gynecology in tertiary medical institute of south India. This study was conducted in collaboration of department of OBGY and dermatology department. A complete medical & obstetric history of each patient was obtained. Complete cutaneous examination was done in all cases to study all the physiological changes of skin and its appendages. As a part of routine Hemoglobin levels, total & differential leukocyte counts, erythrocyte sedimentation rate, urine examination for sugar & proteins, and microscopy were performed in each case. Each patients was followed up till delivery. At follow up visit, each patients was examined clinically, new cutaneous findings were noted. Ethics

Committee clearance and informed consent of patients were obtained.

**Inclusion Criteria**

All pregnant women having symptoms related to skin and mucosa.

**Exclusion Criteria**

Medical disorders associated with skin lesions.

**RESULTS**

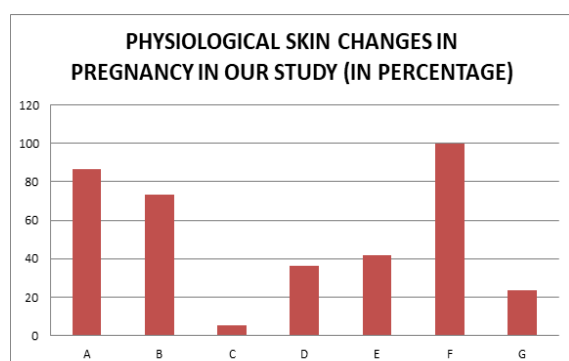
In this study, a total of 200 patients were enrolled over a span of 6 months. The age of our study participants ranged from 17 to 39 years (Table 1), with the majority falling in the 23–25 years age bracket. Of these, 93 females (46.5 %) were primi gravidas and 107 females (53.5 %) were multi gravidas. Most of them (173 cases, 86.5 %) were native of South India and majority belonged to skin type IV (79 cases,70%) and V (182 cases, 30%).

**Table 1: Age distribution of the pregnant women in the study group.(n=200)**

Age Group in Years	Total Number of cases	Percentage of cases (n= 200)
16-20	17	8.5%
21-25	100	50.00%
26-30	74	37%
31-35	8	4.00%
36-40	1	0.50%

**Table 2: Physiological changes in pregnant female in the study group.(n=200)**

Physiological changes seen	No. of cases	Percentage of cases ( n= 200)
Pigmentation	173	86.5
Linea nigra	170	85
Secondary areola	165	82.5
Melasma	36	18
LSCS scar pigmentation	15	7.5
Naevi darkening	1	0.05
Pigmentary demarcation line	1	0.05
Striae	147	73.5
Hair changes	11	5.5
Hirsutism	2	1
Increased hair loss	5	2.5
Improvement in hair growth	4	2
Glandular Changes	79	39.5
Montgomery’s tubercles	70	35
Miliaria	15	7.5
Dyshidrotic eczema	4	2
Vascular Changes	84	42
Non pitting edema of feet	79	39.5
Abdominal wall edema	1	0.05
Varicosities of legs	5	2.5
Vulval edema	4	2
Spider telangiectasias	7	3.5
Mucosal changes	200	100
Jacquemier-Chadwick sign	200	100
Goodell’s sign	200	100
Gingivitis	15	7.5
Nail changes	47	23.5
Transverse grooves	30	15
Rapid nail growth	23	11.5
Subungual hyperkeratosis	13	6.5
Soft and brittle nail	10	5
Ingrown toe nail	1	0.05



**Figure 1: A = PIGMENTATION (86.5%) ; B = STRIAE (73.5%); C = HAIR CHANGES (5.5%); D = GLANDULAR CHANGES (39.5%); E = VACULAR CHANGES (42%); F = MUCOSAL CHANGES (100%); G = NAIL CHANGES (23.5%).**

The youngest and oldest patients were aged 16 and 39 respectively. 50% (n=100) of them belonged to the age group 21-25 years. Majority of the cases had type IV and type V skin. Most of them belonged to lower socioeconomic status.

A total of 200 pregnant women were included in the study. Most common physiological changes observed were mucosal changes (100%), pigmentary changes (86.5%), striae (73.5%), vascular changes (40%), glandular changes (39.5%), nail changes (23.5%) and hair changes (5.5%) [Table 2, Figure 1].

Among the pregnant females, mucosal changes were seen in all pregnant female (100%). Jacquemier-Chadwick's sign & Goodell's sign were seen in all pregnant females. Gingivitis were seen in 15 (7.5%) pregnant females.

Among 200 females, 173 females had pigmentary changes (86.5%) were noted. Linea nigra was seen in 170 (85%) pregnant women, followed by secondary areola in 165 females (82.5%), melasma in 36 females (18%), LSCS scar pigmentation in 15 females (7.5%), nevi darkening 1 female (0.5%) & pigmentary demarcation line in 1 female (0.5%).

147 pregnant females (73.5%) had Striae distensae (striae gravidarum). Hair changes noted among 11 females (5.5%) were increased hair loss in 5 females (2.5%), improved hair growth in 4 females (2%) & hirsutism in 2 females (0.1%).

Vascular changes were noted among 84 (42%) pregnant females. Among these vascular changes non pitting edema of feet was mostly seen in 79 females (36.5%) in our study. Other changes noted were spider telangiectasias in 7 females (3.5%), varicosities of legs in 5 females (2.5%) & abdominal wall edema in 1 female (0.05%).

Glandular changes were noted among 79 (39.5%) pregnant females. 70 (35%) pregnant females had Montgomery's tubercles, 15 (7.5%) pregnant females had miliria and 4 (2%) pregnant females had dyshidrotic eczema.

Nail changes were seen among 47 (23.5%) pregnant females. Nail changes seen in our study are as follows 30 (15%) females had transverse groove, 23 (11.5%) females had rapid nail growth, 13 (6.5%) females had subungual hyperkeratosis, 10 (5%) females had soft and brittle nails and 1 (0.05%) female had ingrown toe nail.

## DISCUSSION

A temporary shift in immunologic, metabolic, and hormonal factors during pregnancy leads to physiological skin manifestations including hyperpigmentation, hair and nail changes, vascular changes, and shifts in apocrine and eccrine gland activity. Increased activity of the maternal adrenal and pituitary glands along with a contribution from the developing fetal endocrine glands, increased cortisone levels, accelerated metabolism, and enhanced production of progesterone and estrogenic hormones are responsible for most skin changes in pregnancy.<sup>[1-3]</sup>

Hyperpigmentation is a common occurrence during pregnancy and may affect up to 90% of pregnant women. Hyperpigmentation which is caused by elevated levels of hormones like melanocyte-

stimulating hormone (MSH), estrogen, and progesterone in the bloodstream. Estrogen stimulates melanin production by melanocytes, and this effect is further enhanced by progesterone, leading to the deposition of melanin in both the epidermis and dermal macrophages. This hyperpigmentation typically begins in the first trimester and primarily affects areas that are already pigmented, such as the nipples, areola, and genital areas. Freckles, moles, and recent scars can also darken and increase in size during pregnancy.<sup>[4]</sup> In our study, the majority of pregnant women experienced hyperpigmentation (86.5%). This is consistent with findings by Muzaffar et al,<sup>[5]</sup> who noted pigmentary changes in 90.7% of cases, and Kumari et al., who reported hyperpigmentation in 91.4% of pregnant women.<sup>[6]</sup> Melasma (chloasma), or the "mask of pregnancy," consists of irregular, but well-demarcated, blotchy dark-brown macules on the face; it occurs in up to 75% of pregnant women and 34% of women taking oral contraceptives. Melasma tends to appear during the second trimester and is more frequent in dark haired, dark-complexioned women.<sup>[7]</sup> In contrast to, Muzaffar et al,<sup>[5]</sup> found melasma in 46.4% of their cases, and Raj et al,<sup>[8]</sup> observed melasma in 8.8% of cases, in our study, melasma was present in 18 % (n = 36) of cases. The cheeks and nose were commonly affected areas. Martin et al,<sup>[9]</sup> reported that melasma typically begins during the second trimester, whereas in our study, most cases experienced the onset of melasma in the early third trimester.

Striae gravidarum /Stretch marks develop in up to 90% of pregnant women during the sixth and seventh months of pregnancy. Possible explanations include stretching of the skin in predisposed individuals, increased adrenocortical activity, relaxin, and estrogen. Physical factors (stretching secondary to increase in the abdominal girth) play a role in the development of the striae.<sup>[4,10-18]</sup> Kumari et al,<sup>[6]</sup> Muzaffar et al,<sup>[5]</sup> Raj et al,<sup>[8]</sup> and Shivakumar and Madhavamurthy,<sup>[10]</sup> reported the occurrence of striae gravidarum in 79.7%, 77.1%, 75.4%, and 66.47% of cases, respectively. In our study, the prevalence of striae gravidarum was 73.5% (n = 147) of cases, with the onset being more common during the third trimester (n = 97, 66%), and this difference was statistically significant (p=0.007). Primigravidas had a higher proportion of striae gravidarum (40.8%), which was also statistically significant (p<0.0001). The abdomen and thighs were the common sites involved.

Lynfield reported a prolonged anagen phase (the growing phase of hair) producing a thicker than normal growth during pregnancy.<sup>[12]</sup> In a study by Kumari et al,<sup>[6]</sup> 11 females (1.8%) had increased hair loss & 5 females (0.82%) had improved hair growth which is consistent with our study 5 females (2.5%) had increased hair loss , 4 females (2%) had improved hair growth & 2 females (1%) had hirsutism.

Increased appearance of Montgomery's tubercles is well known during pregnancy in 30-50% of pregnant

women.<sup>[9]</sup> In our study, Montgomery's tubercles were seen in 70 (35%) cases. This was found to be consistent with Martin AG et al., studies.<sup>[9]</sup> Increased eccrine glands function lead to miliaria, hyperhidrosis, dyshidrotic eczema, and decreased apocrine gland function lead to improvement in hidradenitis suppurativa, fox-fordyce disease.<sup>[13]</sup> Miliria was seen in 15 (7.5%) pregnant females and dyshidrotic eczema in 4 (2%) pregnant females.

Vascular changes result from distention, instability and proliferation of vessels and regress postpartum. Non pitting edema of legs, eyelids, face and hands is present in about 50% of women during the third trimester.<sup>[14]</sup> The edema decreases during the day and is thought to be due to secondary sodium and water retention in conjunction with increased capillary permeability.<sup>[9]</sup> In a study by Muzaffar et al,<sup>[5]</sup> vascular changes were reported in 34.2% of cases, with non-pitting pedal edema observed in 48.5% of cases. In our study, vascular changes were detected in 42% (n = 84) of cases, and non-pitting pedal edema was present in 39.5% of cases. Varicosities have been seen in up to 40% of cases in the literature.<sup>[4,9]</sup> In our study they were noted in only 2.5% of cases. The lower incidence of varicosities in our community may be related to different customs and habits.

Erythema of the vestibule and vagina, called the Jacquemier—Chadwick sign, results from distension of their vasculature, and occurs early in gestation. The bluish discoloration of the cervix, known as the Goodell sign, is also a result of increased vascularity, this time of the cervix.<sup>[15,16]</sup> These physiological changes are seen in all the pregnant female in our study. During pregnancy, the gingivae enlarge, darken and become red and swollen in up to 80% of women. Edema and hyperemia due to hormonal changes as well as local irritation and nutritional deficiencies may be responsible.<sup>[9]</sup> In a study by Muzaffar et al,<sup>[5]</sup> 23/140 (16.4%) had gingival edema and redness. In our studies, 15 (7.5%) females had gingivitis.

Studies report that nail alterations occur in 2% to 40% of gravid women.<sup>[17]</sup> Nail changes may appear during the first trimester and consist of accelerated nail growth, brittleness or softening, distal onycholysis, and subungual keratosis.<sup>[4,18]</sup> In our study 47 (23.5%) pregnant female had nail changes. These were transverse groove in 30 (15%) females, rapid nail growth 23 in females (11.5%), subunugal hyperkeratosis in 13 females 6.5(%), soft and brittle nail in 10 females (5%) and ingrown toe nail in 1 female (0.05%).

## CONCLUSION

Skin changes during pregnancy can be classified into 3 category. These are physiological skin changes in pregnancy, specific dermatosis of pregnancy and various infective and miscellaneous cutaneous disease in pregnancy. Detailed physical assessment and history is important when it comes to skin changes in pregnancy. It is imperative to recognize benign physiological changes to spare the patient and the fetus unnecessary therapeutic interventions which may be potentially harmful, especially given the high-risk state the gestational body represents. This study focuses on various physiological skin changes pertaining to this geographical location. Fortunately, many of these changes will regress or resolve postpartum, so reassurance is the only indicated treatment in most cases.

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