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**Research Article**

# Skin Changes in Pregnancy: A Prospective Observational Study

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**Abstract**
**Background:** Pregnancy is associated with profound hormonal, metabolic, immunological, and vascular changes that lead to various physiological and pathological cutaneous manifestations. Although most skin changes are benign and self-limiting, some pregnancy-specific dermatoses may cause significant maternal discomfort and fetal risk.
**Objectives:** To determine the incidence and pattern of physiological skin changes and pregnancy-specific dermatoses among pregnant women.
**Materials and Methods:** This prospective observational study was conducted in the Obstetrics and Gynecology outpatient department of Nirmala Hospital and Research Center, Jaipur, from February 2020 to October 2025. A total of 960 pregnant women were evaluated through detailed history taking and complete dermatological examination. Women with pre-existing dermatoses were excluded. Findings were categorized into physiological skin changes and specific dermatoses of pregnancy.
**Results:** Out of 960 participants, 536 were primigravida and 424 multigravida. Physiological skin changes were observed in the majority of women, with hyperpigmentation being the most common manifestation. Pregnancy-specific dermatoses were seen in a smaller proportion, with pruritic urticarial papules and plaques of pregnancy (PUPPP) being the most frequent condition.
**Conclusion:** Skin changes are extremely common during pregnancy, predominantly physiological in nature. Awareness of these manifestations helps differentiate benign changes from pathological dermatoses, enabling appropriate counseling and management.

**Keywords:** Pregnancy, Physiological Skin Changes, Pregnancy Dermatoses, Hyperpigmentation, PUPPP.

## Introduction

Pregnancy is a unique physiological state characterized by extensive endocrine, metabolic, vascular, immunological, and hematological adaptations necessary to support fetal growth and development. These systemic changes are reflected prominently in the skin, hair, nails, and mucous membranes, and almost all pregnant women experience some form of cutaneous change during the course of pregnancy (1–3).

The skin undergoes stretching and remodeling to accommodate the expanding uterus, leading to common manifestations such as striae gravidarum, hyperpigmentation, and vascular changes. Approximately 90% of pregnant women develop stretch marks, most commonly over the abdomen and breasts, largely due to hormonal influences and mechanical stretching of the skin (4,5).

While the majority of cutaneous changes observed during pregnancy are physiological and reversible after delivery, a subset of women develop pregnancy-specific dermatoses that may present with significant pruritus and discomfort (6,7). Some of these conditions, such as pemphigoid gestationis and intrahepatic cholestasis–related pruritus, may be associated with adverse maternal or fetal outcomes, highlighting the importance of early recognition and appropriate management (8–10).

Pregnant women frequently express concerns regarding the cosmetic impact of skin changes, their persistence after delivery, recurrence in subsequent pregnancies, and possible effects on the fetus (11,12). A clear understanding of the spectrum of dermatological manifestations during pregnancy is therefore essential for accurate diagnosis, patient reassurance, and timely intervention.

This study was undertaken to document the incidence and pattern of physiological skin changes and pregnancy-specific dermatoses in a large cohort of pregnant women attending a tertiary care center in Jaipur.

**Aims and Objectives**

- To study the incidence of physiological skin changes during pregnancy
- To identify pregnancy-specific dermatoses
- To analyze the pattern of cutaneous manifestations in primigravida and multigravida women

**Materials and Methods**

This prospective observational study was conducted in the Obstetrics and Gynecology outpatient department of Nirmala Hospital and Research Center, Jaipur, from February 2020 to October 2025.

**Study Population**

A total of 960 pregnant women attending antenatal clinics were enrolled after obtaining informed consent.

**Inclusion Criteria**

- Pregnant women of any gestational age
- Willingness to participate in the study

**Exclusion Criteria**

- Pre-existing skin disorders before pregnancy
- Patients lost to follow-up

**Methodology**

A detailed history was obtained for each participant, including age, gravidity, gestational age, onset and duration of skin changes, associated symptoms, and previous history of similar conditions. A complete dermatological examination was performed in all patients. Relevant laboratory investigations were carried out when indicated.

Cutaneous findings were classified into:

1. Physiological skin changes of pregnancy
2. Specific dermatoses associated with pregnancy

**Statistical Analysis**

Data were entered into Microsoft Excel and analyzed using descriptive statistics. Results were expressed as frequencies and percentages.

**Results**

A total of 960 pregnant women completed the study. Among them, 536 (55.8%) were primigravida and 424 (44.2%) were multigravida. The age of participants ranged from 23 to 42 years.

**Physiological Skin Changes**

Physiological skin changes were observed in the majority of participants. Hyperpigmentation in the form of linea nigra and secondary areola was the most common finding, followed by striae gravidarum and other vascular and appendageal changes (Table 1).

**Specific Dermatoses of Pregnancy**

Pregnancy-specific dermatoses were observed in a smaller proportion of women. Pruritic urticarial papules and plaques of pregnancy (PUPPP) was the most common dermatosis, followed by pruritus gravidarum and other specific dermatoses (Table 2).

Table 1. Physiological Skin Changes Observed During Pregnancy (N = 960)

| Physiological skin changes | Number of cases | Percentage (%) |
|---|---|---|
| Linea nigra | 555 | 57.8 |
| Secondary areola | 476 | 49.6 |
| Striae gravidarum | 484 | 50.4 |
| Melasma | 25 | 2.6 |
| LSCS scar pigmentation | 13 | 1.4 |
| Naevi darkening | 2 | 0.2 |
| Pigmentary demarcation line | 2 | 0.2 |
| Increased hair loss | 11 | 1.1 |
| Improvement in hair growth | 5 | 0.5 |
| Montgomery's tubercles | 220 | 22.9 |
| Miliaria | 10 | 1.0 |
| Non-pitting edema of feet | 93 | 9.7 |
| Abdominal wall edema | 3 | 0.3 |
| Varicosities of legs | 3 | 0.3 |
| Vulval edema | 4 | 0.4 |
| Spider telangiectasia | 3 | 0.3 |
| Gingivitis | 92 | 9.6 |

| | | |
|---|---|---|
| Nail changes | 8 | 0.8 |

Multiple physiological skin changes were observed in the same patient; hence totals exceed the study population.

Table 2. Specific Dermatoses Associated With Pregnancy (N = 22)

| Specific dermatoses | Number of cases | Percentage (%) |
|---|---|---|
| Pruritic urticarial papules and plaques of pregnancy (PUPPP) | 14 | 63.6 |
| Pruritus gravidarum | 5 | 22.7 |
| Pemphigoid gestationis | 1 | 4.5 |
| Prurigo gestationis | 1 | 4.5 |
| Pruritic folliculitis of pregnancy | 1 | 4.5 |

## Discussion

Skin changes during pregnancy are extremely common and result from complex hormonal, metabolic, and physiological alterations. In the present study, physiological skin changes constituted the majority of cutaneous manifestations, a finding that is consistent with previously published literature (1,4,6).

Hyperpigmentation was the most frequent physiological change observed in this study. Increased levels of melanocyte-stimulating hormone, estrogen, and progesterone during pregnancy are believed to stimulate melanocyte activity, leading to changes such as linea nigra, secondary areola, and melasma (2,5). Similar observations have been reported by earlier studies describing hyperpigmentation as the most prevalent cutaneous change during pregnancy (4,11).

Striae gravidarum were also commonly observed, particularly in multigravida women. The development of striae has been attributed to hormonal influences, connective tissue alterations, and repeated mechanical stretching of the skin during pregnancy (2,3,6). Previous studies have reported comparable findings, emphasizing the multifactorial etiology of striae gravidarum (4,6).

Among pregnancy-specific dermatoses, pruritic urticarial papules and plaques of pregnancy (PUPPP) was the most commonly encountered condition in the present study. PUPPP typically affects primigravida women and usually presents during the third trimester, findings that are in agreement with earlier Indian and international studies (7–9). Other specific dermatoses, such as pruritus gravidarum and pemphigoid gestationis, were observed less frequently, similar to patterns reported in previous literature (8,10).

The identification of pregnancy-specific dermatoses is clinically important, as certain conditions may be associated with adverse fetal outcomes and require close monitoring (8–10). Early recognition, appropriate treatment, and patient counseling play a crucial role in minimizing maternal discomfort and improving pregnancy outcomes.

## Conclusion

Cutaneous manifestations are almost universal during pregnancy, with physiological skin changes being far more common than pregnancy-specific dermatoses. Most changes are benign and self-limiting; however, awareness of specific dermatoses is essential for timely diagnosis and management. Proper counseling plays a crucial role in alleviating anxiety among pregnant women.

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