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Original Research Article

A cross-sectional study of cutaneous changes during pregnancy in a tertiary care hospital in Northern India

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ABSTRACT

Background: Women undergo profound changes during pregnancy, making them susceptible to a number of dermatological manifestations. We aimed to determine the frequency and pattern of skin changes during pregnancy.
Methods: A cross-sectional observational study was conducted among 400 pregnant women presenting to the Outpatient department of a Tertiary Care Centre in Northern India.
Results: A total of 400 pregnant mothers fulfilling inclusion criteria were included. The pigmentary changes were the most common physiological change seen in 90.8% (n=363) of pregnant women. The most common pigmentary change was secondary areola seen in 83% (n=332) women, followed by linea nigra seen in 37.5% (n=150) pregnant women. Vascular changes were seen in 13% (n=52), non- pitting pedal edema being the most common 10.25% (n=41). Connective tissue changes were seen in 62.25% (n=249) of pregnant women, striae gravidarum being the most common (n=242). The most common specific dermatoses of pregnancy was atopic eruption of pregnancy seen in 4.25% (n=17), followed by intrahepatic cholestasis of pregnancy (n= 14). 3 cases (0.75%) of Polymorphic eruption of pregnancy were seen. 1 case of Pemphigoid gestationis was seen in the third trimester. Approximately 17% of pregnant women were positive for infections among which fungal infection was the most common infection affecting pregnant women, seen in 11.2% (n=45) participants.
Conclusions: The dermatoses of pregnancy are common and have a range of dermatological manifestations apart from their specific pattern; in order to manage and treat them appropriately, proper attention needs to be given.

Keywords: Dermatoses of pregnancy, Pigmentary changes, Dermatological manifestations

INTRODUCTION

During pregnancy, a mother undergoes profound immunologic, metabolic, endocrine, and vascular changes, which leave her vulnerable to various diseases related to her skin and her appendages.[1] The skin findings can be divided into physiologic changes that are aggravated or improved during pregnancy, and changes that are specific to pregnancy.[2]

The majority of skin modifications are benign and resolve during the postnatal period. Only a few pose a risk to the foetus and require antenatal surveillance, such as PG or ICP.

There is concern about cosmetic appearance and the effect of lesions on foetus, as well as the development of similar lesions in subsequent pregnancies. The study helps us to understand common physiological and

pathological changes of the skin during pregnancy in the study area and their early identification.

Aims and objectives

The purpose of this study was to determine the frequency and pattern of skin changes in pregnant women presenting to a tertiary care centre in Greater Noida, including physiological and specific dermatoses.

After approval from the Institutional Ethics committee, the study was conducted from January 2020 till July 2021.

METHODS

Study site

Pregnant females attending out-patient department of Dermatology and Antenatal clinic of Obstetrics and Gynaecology Department at Sharda hospital.

Study design

The study design was cross sectional observational study.

Sample size

After obtaining informed consent 400 cases were enrolled in the study.

Inclusion criteria

All pregnant women irrespective of age, parity, socioeconomic status presenting in Dermatology Department and Antenatal clinic of Obstetrics and Gynaecology Department with or without skin complaints. Have given written and informed consent.

Exclusion criteria

Patient with sexually transmitted conditions.

The following data were taken:

Informed consent. Detailed history including chief complaints related to skin. Onset in relation to duration of pregnancy. Complete general physical & systemic examination. Associated skin / medical disorders. Investigations-CBC, OGTT, TSH, VDRL, HIV, HBsAg, Anti-HCV, Urine routine examination LFT, S.bile Acids, KOH mount, Skin biopsy and DIF performed wherever required.

Statistical analysis

All the data obtained were entered in Microsoft excel and statistical analysis was performed using the Statistical package for social sciences (SPSS) v21 operating on windows 10. The patient's data was summarised using the frequency, percentage, mean and standard deviation, and data was presented using tables.

RESULTS

In the present study total of 400 pregnant mothers fulfilling inclusion criteria were included after obtaining informed consent from all.

The mean age of participants was 25.47±3.71 years of age, with a majority in the age group of 18-25 years (54.8%) followed by 35.3% in 26-30 years and 10% with 31-35 years. Majority of women presented in the third trimester 49.2% (n=197), followed by women in the second trimester 34% (n=136) and 16.8% (n=67) presented in the first trimester of pregnancy. Majority of women were multigravida 66% (n=264) and 34% (n=136) were primigravida. The pigmentary changes were the most common physiological change seen in 90.8% (n=363) of pregnant women. Vascular changes were seen in 13% (n=52) of pregnant women. Connective tissue changes were seen in 62.25% (n=249) of pregnant women. Changes in appendages were seen in 17% (n=68) of participants. Specific dermatoses of pregnancy was seen in 8.7% (n=35) pregnant women.

Table 1: Trimester wise pigmentary changes.

	1st Trimester	2nd Trimester	3rd Trimester	Frequency	Percentage
Chloasma	3	14	53	70	17.5
Linea Nigra	1	10	139	150	37.5
Areola/Nipple	43	107	182	332	83
Genital areas	-	-	3	3	0.75
Nevi / Freckles	-	-	1	1	0.25

Table 2: type of chloasma among the participants.

		Frequency	Percentage
Type of Chloasma	Centro facial	31	44.2
	Malar	39	55.8
	Mandibular	-	-

Table 3: trimester wise distribution of vascular changes.

	1st Trimester	2nd Trimester	3rd Trimester	Frequency	Percentage
Spider nevi	-	1	-	1	0.25
Palmar erythema	-	5	1	6	1.5
Pyogenic Granuloma	-	-	2	2	0.5
Pedal oedema	-	-	41	41	10.25
Varicose Veins	-	-	2	2	0.5

Table 4: trimester wise distribution of connective tissue changes.

	1st Trimester	2nd Trimester	3rd Trimester	Frequency	Percentage
Striae gravidarum	3	68	171	242	60.5
Acrochordon	-	1	6	7	1.75

DISCUSSION

In the present study, the pigmentary changes were the most common physiological change seen in 90.8% (n=363) of pregnant women. The most common change was hyperpigmentation in the areola and nipple 83%, (n=332), followed by linea nigra in 37.5% (n=139). Chloasma was seen in 17.5% (n=70). The most common clinical pattern was malar 55.7% (n=58) followed by centrofacial seen in 44.2% (n=31) pregnant women. Hyperpigmentation in the genital area was reported by 3 participants (0.75%) and only 1 participant (0.25%) presented with the appearance of new nevi. Most of these pigmentary changes were seen in the third trimester (Table 1, 2). The increased prevalence of pigmentary changes may be related to elevated serum levels of melanocyte stimulating hormone, oestrogen and possibly progesterone.

DISCUSSION

In the present study, the pigmentary changes were the most common physiological change seen in 90.8% (n=363) of pregnant women. The most common change was hyperpigmentation in the areola and nipple 83%, (n=332), followed by linea nigra in 37.5% (n=139).

Table 5: sites involving striae gravidarum.

	Frequency	Percentage
Abdomen	193	96
Thighs	26	12.9
Breast	20	5
Upper arm	6	1.5

Chloasma was seen in 17.5% (n=70). The most common clinical pattern was malar 55.7% (n=58) followed by centrofacial seen in 44.2% (n=31) pregnant women. Hyperpigmentation in the genital area was reported by 3 participants (0.75%) and only 1 participant (0.25%) presented with the appearance of new nevi. Most of these pigmentary changes were seen in the third trimester (Table 1, 2). The increased prevalence of pigmentary changes may be related to elevated serum levels of melanocyte stimulating hormone, oestrogen and possibly progesterone. In a study by Rao et al Linea nigra was the most common pigmentary alteration in 242 (60.5 per cent) cases, followed by secondary areola in 195 (48.75 per cent) cases, hyperpigmentation in 132 (33%) cases, melasma in 124 (31%) cases, pigmentary demarcation lines in 9 (2.25 per cent) cases, and melanocytic nevus in one (0.25 per cent) case.[3] The study by Dabette et al documented, pigmentary changes in 67.3%, linea nigra among 93.9%, pigmentation around areola and nipples in 77.5% of multigravida and 52.6% among the primigravida. Melasma was seen in 35.8% of the patients.[4] Haritha et al documented Linea nigra as the most common pigmentary for primigravida and multigravida women, accounting for 80.4 per cent and 93.9 per cent, respectively.[5]

In our study, vascular changes were seen in 13% (n=52). The most common vascular change seen was non-pitting pedal edema seen in 10.25% (n=41) participants, followed with palmar erythema in 1.5% (n=6), varicose veins and pyogenic granuloma in 0.5% (n=2). One patient presented with spider nevi on the face (Table 3).

Table 6: Appendages changes among the participants.

Appendages changes		Frequency	Percentage
	Nil	332	83
Glandular changes	Acne	23	5.8
	Miliaria	1	0.2
	Montgomery Tubercles	19	4.8
Nail changes	Brittle Nail	1	0.2
Hair Changes	Dryness	3	0.7
	Hairfall	21	5.3

Table 7: Trimester wise distribution of specific dermatoses of pregnancy.

	1st Trimester	2nd Trimester	3rd Trimester	Frequency	Percentage
Polymorphic eruption of pregnancy	-	1	2	3	0.75
Atopic eruption of pregnancy	1	16	-	17	4.25
Intrahepatic cholestasis of pregnancy	-	1	13	14	3.5
Pemphigoid gestationis	-	-	1	1	0.25

Table 8: Specific infections found among pregnant women.

Infections	Specific Infections	Frequency	%
Bacterial	Furuncle	3	0.8
	Scalp folliculitis	1	0.2
Viral	Herpes simplex labialis	4	1
	Varicella	1	0.2
Arthropod	Scabies	15	3.8
Fungal	Tinea corporis et cruris	29	7.2
	Tinea faciei	3	0.7
	Tinea mannum	6	1.5
	Tinea pedis	7	1.8

In the third trimester, a higher proportion of pedal edema was observed; this may be due to increased venous pressures in the femoral and pelvic vessels caused by the gravid uterus.

Muzaffar et al reported vascular changes in 34.2% of cases, with non-pitting pedal oedema in 48.5% of cases.[6] In a study done by Ikram et al the most common vascular change noted was palmar erythema.[7] Panicker et al documented the vascular changes including pedal edema, gingivitis and varicose veins.[8] Rao et al reported non pitting edema of feet in 84 (12%) cases and purpura in 3 cases (0.75%). Spider Angiomas were seen in 3, Telangiectasia was seen in 4 cases (1%) and palmar erythema was seen in 5 cases (1.25%).[3]

In our study, the connective tissue changes were seen in 62.25% (n=249). Among them, the most common was striae gravidarum seen in 60.5% (n=242) followed with acrochordon seen in 1.75% (n=7) of participants. The most common sites involving striae were abdomen 96% (n=193), followed with involvement of thighs seen in 12.9% (n=26), breast in 5% (n=20) and upper arm 1.5 % (n=6) (Table 4, 5). The onset of striae gravidarum was more common during the third trimester. Adrenocortical hormones, oestrogen, relaxin and physical factors such as stretching secondary to an increase in the abdominal girth, might explain the prevalence of striae in third trimester. There also seems to be an association between maternal weight gain, foetal birth weight with the development of striae.

In a study by Ikram et al majority were seen with the presence of striae gravidarum in 71.5%.[7] Kumari et al and Kannambal et al reported straie gravidarum 79.7 and 79.6% respectively.[9,10] Rao et al reported 8 cases of Molluscum fibrosum gravidarum in (2%).[3]

On the assessment of appendages, 17 % (n=68) of pregnancy showed positive findings, with acne being major seen in 5.7% (n=23) followed with Montgomery tubercle seen in 4.8% (n=19) and miliaria seen in 1 patient. Brittle nails were seen in 1 pregnant woman and hair changes were seen in 6% (n=24) of pregnancy, among them 5.3% complained of hair fall and 0.8% with dryness of hair during pregnancy (Table 6).

Kannambal et al reported hirsutism in (0.6%) and telogen effluvium in (1%) participants. Miliaria was observed in 13.6% (n=68) of cases. This has been attributed to increased eccrine function during pregnancy.[10] Rao et al, reported Nail changes in pregnancy like transverse ridging, nail brittleness, leuconychia, distal onycholysis were in 9 cases (2.25%).[3]

In our study, specific dermatoses of pregnancy were seen in 8.75% (n=35) participants, (Table 7). The most common was atopic eruption of pregnancy seen in 4.25% (n=17), followed with intrahepatic cholestasis of pregnancy seen in 3.5% (n=14), polymorphic eruption of pregnancy was seen in 0.75% (n=3) and pemphigoid gestationis was seen in 0.25% (n=1) pregnant women. AEP was seen majorly in the second trimester; however other specific dermatoses were seen late in pregnancy. In ICP the most commonly found parameter was raised S. Bile acids. Our patient of PG presented at 32 weeks of gestation in her fourth pregnancy. Her biochemical parameter (LFT, S. bile acids) was normal. The diagnosis was confirmed by skin biopsy and DIF. Histopathological examination revealed subepidermal bulla with plasma cells and few eosinophils in the bullous cavity with a moderate degree of perivascular infiltration by lymphocytes and eosinophils. Direct Immunofluorescence showed a thin linear deposit of IgG and C3 at basement membrane zone.

In a study by Kannambal et al the most common specific dermatoses was ICP (n=52) followed by AEP (n=10) and

8 cases of PEP. No case of pemphigoid gestations was seen.[10] Kumari et al reported 14 cases of polymorphic eruption of pregnancy and 5 cases of intrahepatic cholestasis of pregnancy.[9] A study by Puri et al showed that polymorphic eruption of pregnancy caused 22% of cases, prurigo of pregnancy caused 7% of cases, pemphigoid gestationis caused 3% of cases, pruritic folliculitis caused 2% of cases, and intrahepatic cholestasis caused 1% of cases.[11]

In our study, we found an increased incidence of infection during pregnancy, which is associated with low cellular immunity (Table 8). In present study 17.2% (n=69) of pregnant women were positive for infections, among which majority presented with fungal infection in 11.2% (n=45) followed with arthropod infection (scabies) in 3.8% (n=15), viral infections in 1.2% pregnancy (n=5), and bacterial infections in 1% (n=4) of pregnancy. In a study by Panicker et al the common manifestation was vulvovaginal candidiasis, tinea versicolor, scabies and dermatophytosis.[8] In a study by Haritha et al scabies infested 16% of the population. Tinea versicolor was the most widespread fungal skin infection, affecting 14% of the population.[5]

Limitation of the study

Though our study had good no. of patients, a longer duration of study with more no. of patient may be ideal to establish the better incidence of pregnancy dermatoses.

CONCLUSION

Dermatological manifestations of pregnancy are common and have a wide range of clinical presentations apart from the specific pattern. The management and treatment of pregnancy dermatoses requires proper attention. We hope that our study will provide psychological counselling for pregnant women who present with physiological changes and at the same time early identification and management of specific dermatoses will improve the management and outcome of pregnancy.

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