

## Prevalence of Pruritis in Pregnancy: A Prospective Study from the North India

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### Abstract:

**Background:** Pregnancy-related specific dermatoses are skin conditions that develop during pregnancy and go away after delivery. Itching and only secondary skin lesions in the form of excoriations, with or without signs of cholestasis, are the main symptoms of the skin illness known as pruritus gravidarum in gravid women. So, the present study was conducted with an aim to evaluate the prevalence and characteristics of pruritus among pregnant women.

**Methods:** The present prospective cross-sectional study was conducted among pregnant women in the outpatient (OPD) of the department of Obstetrics and Gynecology for 12 months. Complete dermatological examination was done in all cases to study the physiological and pathological changes of skin. Appropriate investigations were done if required to confirm the diagnosis. A preformed questionnaire was used for data collection to document baseline characteristics pruritis type and pruritis characteristics. The collected data was entered in the Microsoft (MS) Excel Spreadsheet and also, analysis of data carried out using MS Excel Spreadsheet. A p value of <0.05 was considered as statistically significant.

**Results:** In present 256 pregnant subjects were enrolled. The mean age of study subjects was 27.9±5.6 years. The prevalence of pruritis among enrolled subjects was 18.3%. The most common pruritis type was pruritis gravidarum (12.5%) and least common was pruritic folliculitis (0.8%). No pruritis was observed in the first and second trimester mothers and mothers with 3 or more gravida. In our study, among the subject with pruritis, more than four fifth of the them were having pruritis in the abdomen (89.4%) and chest region (83.0%). Chi-square analysis showed significant association between variables (period of gestation and trimester) with the pruritis (p<0.05).

**Conclusion:** During pregnancy, pruritus is frequent. While it can be the outcome of physiologic changes associated with pregnancy or diseases peculiar to pregnancy, it might also be an indication of an underlying, unrelated illness process.

**Keywords:** Pruritis, Pregnancy, Dermatoses, Atopic Eruption of Pregnancy, Intrahepatic Cholestasis Of Pregnancy.

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### Introduction

A variety of changes in the skin and appendages are related to pregnancy, a phase of significant physiological and hormonal change. A skin condition of some type occurs in more than 90% of pregnant women. Around 20% of pregnant women develop pruritus. There is still no known precise cause of pruritus gravidarum. Its cause has been attributed in largely to hormonal and genetic factors. The condition typically starts during the third trimester, when hormone levels are at their peak, and ends with birth. Additionally, it might reoccur during consecutive pregnancies, providing evidence that the condition is triggered by hormones[1,2,3].

There are obvious racial and geographic variations in the occurrence of pruritus gravidarum. The geographic and racial diversity of the cases suggests a hereditary component to the condition. Multiple drug resistance gene 3 (MDR3), also known as ABCB4 heterozygous mutations have been linked to the aetiology of the illness. The transport protein canalicular phosphatidylcholine translocase is encoded by the MDR3 gene. A personal or familial history of intrahepatic cholestasis in a prior pregnancy, multiple gestations, chronic hepatitis C, and advanced maternal age are risk factors for intrahepatic cholestasis of pregnancy [4,5,6].

Pregnancy-related specific dermatoses are skin conditions that develop during pregnancy and go away after delivery. Itching and only secondary skin lesions in the form of excoriations, with or without signs of cholestasis, are the main symptoms of the skin illness known as pruritus gravidarum in gravid women. In the medical literature, the terms "pruritus gravidarum" and "intrahepatic cholestasis of pregnancy" are interchangeable, with pruritus gravidarum referring to people who experience pruritus without experiencing primary skin abnormalities [7,8].

To clarify, pruritus gestation is does not have a distinct rash associated with it, but many individuals will show signs of self-inflicted excoriations caused by scratching to try to ease pruritus symptoms. The soles and palms are most frequently affected by itching, which can range in intensity from mild to severe. At night, symptoms could get worse. Clinicians should be aware of pruritus gestation is because these patients need to be checked for intrahepatic cholestasis of pregnancy. Since intrahepatic cholestasis of pregnancy is the most prevalent liver condition especially linked to pregnancy, the majority of obstetric doctors can anticipate encounter it during their professions [9,10]. If intrahepatic cholestasis of pregnancy is identified in a patient, the treatment strategy, the timing of birth, the antenatal assessment of the foetus, and the management of subsequent pregnancies may all change. So, the present study was conducted with an aim to evaluate the prevalence and characteristics of pruritus among pregnant women.

### Materials and Methods

The present prospective cross-sectional study was conducted among pregnant women (irrespective of maternal age or gestational age) attending outpatient (OPD) of the department of Obstetrics and Gynecology in tertiary care teaching hospital of North India for 12 months (May 2021 to April 2022) after obtaining the ethical approval from the institutional ethical committee. The informed written consent was obtained from the pregnant mothers prior to the enroll-

ment into the study. The subjects with pregnancy induced hypertension (PIH), HELLP and other causes of cholestasis (viral hepatitis, gall stones, etc) were excluded.

### Data Collection

Complete dermatological examination was done in all cases to study the physiological and pathological changes of skin and relevant systemic examination was carried out. Appropriate investigations were done if required to confirm the diagnosis. A pre-formed questionnaire was used for data collection to document baseline characteristics (age, parity, period of gestation), pruritis type (pruritus gravidarum, PUPPP, prurigo of pregnancy and pruritic folliculitis), and pruritis characteristics (location, timing, frequency, Itch related sensation). In addition, all women with pruritus were assessed for its severity according to the 12-Item Itch Questionnaire(12-IQ). The 12-IQ consists of 12 questions about various aspects of pruritus giving the final score ranging from 0 (no pruritus) to 22 points (the most severe pruritus).

### Statistical Analysis

The collected data was entered in the Microsoft (MS) Excel Spreadsheet and also, analysis of data carried out using MS Excel Spreadsheet. The qualitative variables were expressed as number and percentages and quantitative variables were expressed in mean and SD. Chi square test was used to find association between dependent, and independent variables and a p value of <0.05 was considered as statistically significant.

### Results

In present 256 pregnant subjects were enrolled. The mean age of study subjects was 27.9±5.6 years. Nearly half of subjects (49.6%) were in the age group of 21-25 years and only 0.8% of subjects were above age 35 years. The four fifth of subjects (80.9%) were in the third trimester and only 1.9% of were in their first trimester. More than half of subjects (58.2%) were primigravida and only 1.2% of subjects were having gravida status of 4 or more (Table 1).

**Table 1: Baseline characteristics of the study subjects (N=256)**

Variables	Number	%
Age group		
<21 years	44	17.2
21-25 years	127	49.6
26-30 years	73	28.5
31-35 years	10	3.9
>35 years	2	0.8
Period of gestation		
First Trimester	5	1.9

Second Trimester	44	17.2
Third Trimester	207	80.9
Gravida		
1	149	58.2
2	83	32.4
3	20	8.2
4 or more	3	1.2

In the present study when subjects were clinically examined the 47 out of 256 subjects were having specific dermatoses as pruritis, so the prevalence of pruritis among enrolled subjects was 18.3%. The most common pruritis type was pruritis gravidarum (12.5%) and least common was pruritic folliculitis (0.8%). No pruritis was observed in the first and second trimester and the most common pruritis type among subjects in the third trimester was pruritis

gravidarum (15.5%) and least common was pruritic folliculitis (1.0%). Also, no pruritis was observed among females with 3 or more gravida, whereas the most common pruritis type among subjects in the with primigravida and gravida of 2, was pruritis gravidarum (18.1% and 6.0% respectively) and least common was pruritic folliculitis (1.0% and 0.0% respectively) (Table 2).

**Table 2: Classification of the pruritis among study subjects (N=256)**

Variables	Number (%)			
	Pruritis gravidarum	PUPPP	Prurigo of pregnancy	Pruritic folliculitis
Overall (n=47)	32 (12.5)	6 (2.3)	7 (2.7)	2 (0.8)
Period of gestation				
First Trimester (n=5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Second Trimester (n=44)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Third Trimester (n=207)	32 (15.5)	6 (2.9)	7 (3.4)	2 (1.0)
Gravida				
1 (n=149)	27 (18.1)	5 (3.4)	4 (2.7)	2 (3.4)
2 (n=83)	5 (6.0)	1 (1.2)	3 (3.6)	0 (0.0)
3 (n=20)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
4 or more (n=3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

In our study, among the subject with pruritis (n=47), more than four fifth of the them were having pruritis in the abdomen (89.4%) and chest region (83.0%). 31.9% of subjects were having pruritis in the breast area and 10.6% of subjects were having pruritis in the scalp. The most common itch related sensations among subjects were tingling (48.9%) and tickling (42.6%). Among 6.4% of subjects the itch was asso-

ciated with numbness sensation and among 2.1% of subjects the itch was associated with pain. The pruritis was present all the time among 61.7% subjects, and 27.7% and 10.6% of subjects the pruritis was present often and rarely respectively (Table 3). Regarding the 12-IQ the mean score was 9.8±3.2 points (range: 4-18 which reflected 21.6% to 76.2% of the maximal itch scoring according to 12-IQ).

**Table 3: Characteristics of pruritis among study subjects (N=47)**

Variables	Number	%
Location*		
Abdomen	42	89.4
Chest	39	83.0
Hands	21	44.7
Shanks	18	38.3
Feet	17	36.2
Forearms	17	36.2
Thighs	16	34.0
Back	16	34.0
Shoulders and arms	15	31.9
Breasts	15	31.9

Scalp	5	10.6
Frequency		
Rarely	5	10.6
Often	13	27.7
All the time	29	61.7
Itch related sensation*		
Tickling	23	48.9
Burning	20	42.6
Tingling	10	21.3
Pinching	8	17.0
Prickling	8	17.0
Numbness	3	6.4
Pain	1	2.1

\*Multiple responses

In present study 80.9% subjects with pruritis were primigravida and 19.1% of subjects with pruritis were multigravida and chi-square analysis showed this association as significant ( $p < 0.05$ ). Also, in our study, no pruritis was observed in the first and second trimester and all pruritis cases were in the third trimester (100.0%) and chi-square analysis showed this association as significant ( $p < 0.05$ ) (Table 4).

**Table 4: Association of pruritis with POG and gravida among study subjects (N=256)**

Variables	Number (%)		P value
	Pruritis present (n=47)	Present absent (n=209)	
Period of gestation			
First Trimester (n=5)	0 (0.0)	5 (2.3)	0.001
Second Trimester (n=44)	0 (0.0)	44 (21.1)	
Third Trimester (n=207)	47 (100.0)	160 (76.6)	
Gravida			
Primigravida (n=149)	38 (80.9)	111 (53.1)	0.0004
Multigravida (n=107)	9 (19.1)	98 (46.9)	

## Discussion

Numerous cutaneous changes occur during pregnancy, some of which are particularly linked to the condition (pregnancy-related dermatoses), some of which are modifiable by the condition, and others which are more prevalent and are referred to as physiologic. Usually, neither the mother's nor the fetus's health is harmed by these physiological skin changes. However, some can be important to the dermatologist and have an impact on cosmetics [11].

In the present study when subjects were clinically examined the 47 out of 256 subjects were having specific dermatoses as pruritis, so the prevalence of pruritis among enrolled subjects was 18.3%, which was similar to the prevalence reported in the studies by Raj et al., (16.3%) and Kenyon et al., (approximately 23.0%) but much higher when compared to the study of Kumari et al., where the prevalence was reported as 3.6% for specific dermatoses of pregnancy [12,13,14].

In our study, no pruritis was observed in the first and second trimester and all pruritis cases were in the third trimester (100.0%). Similarly, studies by

Kroumpouzou et al., Shivakumaret al., Raj et al., Powell et al., and Geraghty et al., showed occurrence of pruritis seems to be most common in the third trimester [12,15,16,17,18].

Pruritus gravidarum, or gestational pruritus, is defined as maternal pruritus without hepatic impairment or underlying dermatological disorder. Onset is typically in the last trimester of pregnancy, characterised by pruritus which may be focused over the abdomen or generalised. Importantly, primary skin lesions are absent and serum bile acids and liver function tests are normal. It typically appears in the last trimester and disappears soon after delivery, tending to recur in subsequent pregnancies [19]. In our study the most common pruritis type was pruritus gravidarum (12.5%) and among subjects in the third trimester was pruritus gravidarum (15.5%). Studies by Shivakumar et al., and Raj et al., reported a prevalence of 3.52% and 0.1% for pruritus gravidarum respectively [12,16]. The study by Kroumpouzou et al., showed that pruritus gravidarum was seen in the third trimester of pregnancy in 70% of cases [15]. The incidence of pruritus gravidarum varies from 0.02% to 2.4% of pregnancies [20].

Previously known as pruritic and urticarial papules and plaques of pregnancy (PUPPP), late-onset prurigo of pregnancy, erythema multiforme of pregnancy, and Bourne's toxemic rash of pregnancy, PEP is a benign inflammatory disorder of the skin associated with pregnancy. Lesions classically present in striae distensae, spreading to the trunk and proximal thigh over the course of days. It is among the most common dermatoses of pregnancy, with an incidence of 1:200–250 pregnancies [21,22]. In our study the prevalence of PUPPP was 2.9%. Studies by Shivakumar et al., and Raj et al., reported a prevalence of 2.35% and 0.2% for PUPPP respectively [12,16]. In our study the prevalence of PUPPP was higher in third trimester and most of cases were primigravida and it was consistent with the studies by Kumari et al., Shivakumar et al., Aronson et al., Dotz et al., and Black et al., [14,16,23,24,25].

In our study, among the subject with pruritis (n=47), more than four fifth of the them were having pruritis in the abdomen (89.4%) and chest region (83.0%). 31.9% of subjects were having pruritis in the breast area and 10.6% of subjects were having pruritis in the scalp. Similar results were observed in a study by Kenyon et al., [13].

### Conclusion

During pregnancy, pruritus is frequent. While it can be the outcome of physiologic changes associated with pregnancy or diseases peculiar to pregnancy, it might also be an indication of an underlying, unrelated illness process. Obstetric providers must be aware of these possibilities and adopt a systematic approach to examination because each of these etiologies has a specific prognosis, implications for foetal monitoring, and treatments. This enables prompt diagnosis and management.

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