

ORIGINAL ARTICLE**Investigating Pruritus in Pregnancy: An Observational Analysis**¹Anup Goyal, ²Preeti Jakhar^{1,2}Assistant Professor, Department of Skin & VD, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India**ABSTRACT:**

Background: Pregnancy induces a range of physiological transformations involving hormonal, metabolic, and immunologic shifts. These alterations not only affect overall bodily functions but also impact the composition of the skin and mucous membranes. A common manifestation observed in around 90% of pregnant women is the hyperpigmentation of the skin, particularly noticeable in naturally pigmented regions such as the genitals, perineum, periumbilical skin, and areolae. **Methods:** A cross-sectional observational study was organized, receiving approval from the Institutional Ethics Committee. Over the designated 8-month data collection period, a total of 430 consecutive pregnant women were enrolled in the study. Each participant underwent a comprehensive process involving detailed medical history assessments and thorough physical examinations, with a particular focus on identifying instances of pruritus. **Results:** The study encompassed a cohort of 430 participants, with an average age of 32.6 ± 4.6 years and an average gestational age of 30.4 ± 5.8 weeks. Primiparas constituted 71.5% of the pregnant women, while multiple pregnancies accounted for 7.3% of the total cases. The overall prevalence of pruritus throughout the entire duration of pregnancy was 40.2%. However, at the time of examination (point prevalence), only 19.2% (n = 84) of patients reported experiencing pruritus. Notably, 7.1% of women disclosed experiencing pruritus before the onset of their pregnancy. **Conclusion:** Investigating pruritus during pregnancy involves a meticulous evaluation, including a comprehensive medical history and thorough physical examination. In certain cases, laboratory studies, such as assessing liver transaminase levels, serum bile acid levels, and occasionally performing a skin biopsy, may be warranted to establish a more accurate diagnosis. It's important to note that the treatments recommended for these conditions are deemed safe during pregnancy, ensuring the well-being of both the expectant mother and the developing fetus. **Keywords:** immunologic, pruritus, meticulous, transaminase.

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INTRODUCTION

Pregnancy signifies a transformative physiological phase characterized by a cascade of hormonal, metabolic, and immunologic adjustments. These dynamic alterations exert profound effects on both the functional dynamics of the body and the structural integrity of the skin and mucous membranes. Notably, a conspicuous manifestation observed in a significant majority (90%) of pregnant women is the hyperpigmentation of the skin. This phenomenon is particularly evident in anatomical regions predisposed to higher pigmentation, such as the genitals, perineum, periumbilical skin, and areolae.¹ Simultaneously, the stretching of the abdominal region during pregnancy often gives rise to striae gravidarum, colloquially known as "stretch marks." This phenomenon is a result of the intricate interplay between genetic predispositions and hormonal fluctuations, underscoring the multifaceted nature of physiological changes during gestation. In approximately 75% of pregnancy cases, women may experience the development of gray-brown patches on the face, recognized as the "mask of pregnancy" or melasma. This pigmentation-related alteration further contributes to the intricate mosaic of changes during this unique period. Moreover, expectant mothers may present with physiological modifications in hair, nails,

and vasculature.² Distinguishing these alterations from potentially pathological symptoms becomes paramount to prevent unnecessary or inappropriate therapeutic interventions. Within the spectrum of dermatological changes associated with pregnancy, there exists a distinct category of specific dermatoses. Notable among these are atopic eruption of pregnancy (AEP), polymorphic eruption of pregnancy (PEP), pemphigoid gestationis (PG), and intrahepatic cholestasis of pregnancy (ICP). These conditions underscore the complexity of dermatological manifestations during pregnancy, necessitating a nuanced approach to diagnosis and management. In essence, the journey of pregnancy unfolds as a symphony of intricate physiological transformations, each note contributing to the harmonious yet diverse tapestry of changes that define this remarkable period in a woman's life. Understanding and navigating these changes not only enhances the well-being of the expectant mother but also contributes to the broader landscape of maternal and fetal health.

Pruritus, characterized by itching, impacts as many as 20% of pregnant women. Its intensity can reach levels that significantly disrupt sleep patterns and compromise the overall quality of life, potentially contributing to or exacerbating depression. While pruritus is frequently attributed to dry skin, during

pregnancy, it can also serve as a manifestation of an underlying and pregnancy-specific condition.³ Among the dermatological challenges associated with pregnancy, pruritic urticarial papules and plaques of pregnancy (PUPPP), intrahepatic cholestasis of pregnancy (ICP), pemphigoid gestationis (PG), and atopic eruption of pregnancy stand out. Each of these conditions presents distinct characteristics, emphasizing the need for a nuanced understanding and differential diagnosis in the management of pruritus during pregnancy. Recognizing the diverse etiologies of pruritus in pregnant women is crucial not only for alleviating the associated discomfort but also for addressing potential underlying health concerns unique to this period.

The endocrinology of pregnancy orchestrates a surge in maternal adrenal and pituitary gland activity, coupled with the physiological development of fetal endocrine glands. Key players in this hormonal symphony include progesterone and estrogen, alongside other factors such as elevated cortisone levels. These hormonal fluctuations wield considerable influence over the skin during pregnancy, potentially reshaping the pruritus pathway and contributing to itching in susceptible individuals.^{4,5} Recognizing the diverse presentations of pruritus, the International Forum for the Study of Itch (IFSI) has devised a classification system for chronic itch. This system aids clinicians in categorizing patients into three distinct groups: those with pruritus on diseased (inflamed) skin (group I), individuals experiencing pruritus on non-diseased (non-inflamed) skin (group II), and those with chronic secondary lesions (group III). Further subdivision is based on the etiology of pruritus, spanning dermatological, systemic, neurological, and psychogenic origins. Patients falling outside these categories or exhibiting features of more than one category are considered to have a mixed category of pruritus. In cases where the underlying cause remains elusive, pruritus is designated as having an unknown origin. Recent publications on this subject highlight that the prevalence of pruritus, encompassing both acute and chronic forms, in the general population is estimated to be around 8% to 10%. However, the frequency of pruritus may vary across specific demographics, with a higher prevalence observed in elderly individuals and certain populations, such as patients undergoing dialysis.⁶ Understanding these nuances is crucial for healthcare providers in comprehensively addressing and managing pruritus in diverse patient groups.

Physicians play a crucial role in the comprehensive care of pregnant individuals experiencing dermatological conditions, especially those associated with pruritus. Being well-versed in these conditions is essential for differentiating between those that can be managed symptomatically and those requiring more extensive investigation. Some of these conditions may necessitate evaluation and management by a multi-disciplinary team, often including specialists such as

an obstetrician or maternal-fetal medicine specialist, a family physician, a dermatologist, and at times, a gastroenterologist. The collaboration of a diverse team of medical professionals is particularly valuable when dealing with complex dermatoses of pregnancy or cases where the underlying causes of pruritus are intricate and multifaceted.⁷ Conditions such as pruritic urticarial papules and plaques of pregnancy (PUPPP), intrahepatic cholestasis of pregnancy (ICP), pemphigoid gestationis (PG), and atopic eruption of pregnancy may benefit from the collective expertise of various specialists to ensure a comprehensive and integrated approach to diagnosis and management. By leveraging the insights of different medical disciplines, physicians can provide more nuanced care tailored to the unique needs of each patient. This collaborative model facilitates not only accurate diagnosis and targeted management but also the optimization of patient outcomes and overall well-being during pregnancy.⁸

MATERIALS AND METHODS

In the pursuit of scientific inquiry, a meticulously designed cross-sectional observational study unfolded, guided by a thoughtful plan that garnered the requisite approval from the Institutional Ethics Committee. This crucial endorsement laid the ethical groundwork for the research endeavors that followed. The study, with a carefully stipulated data collection window spanning 8 months, sought to delve into the realms of pregnancy-related experiences, particularly focusing on aspects related to pruritus, or the sensation of itching. Within this defined timeframe, a noteworthy cohort comprising 430 consecutive pregnant women willingly participated, contributing their invaluable insights to the unfolding narrative of maternal health. The research methodology was comprehensive, involving an intricate blend of meticulous medical history assessments and detailed physical examinations.⁹ These examinations were executed with a specialized emphasis on pruritus, recognizing its significance in the spectrum of experiences encountered during pregnancy. The thoroughness of the medical history-taking process sought to unravel the intricacies of each participant's health journey, capturing a nuanced understanding of their unique backgrounds. Simultaneously, the detailed physical examinations, conducted with precision, aimed to unearth subtle signs and manifestations, with pruritus emerging as a focal point of scrutiny. This holistic approach not only provided a robust foundation for the study's overarching objectives but also underscored a commitment to understanding the multifaceted dimensions of health during pregnancy. By placing a specific emphasis on pruritus, the study aspired to contribute not only to the scientific body of knowledge but also to the potential improvement of healthcare practices tailored to the unique needs of expectant mothers. The recruited cohort, in its diversity and willingness to participate, became an

integral part of this scientific exploration, advancing our collective understanding of maternal health in the context of pruritus during pregnancy.

The evaluation of pruritus severity among all study participants was conducted with precision, utilizing two well-established assessment tools: the Visual Analogue Scale (VAS) .¹⁰The VAS, initially devised for measuring pain intensity, has seamlessly transitioned into a widely accepted instrument for gauging the severity of itch. It consists of a 10-cm long horizontal line, where participants mark the point corresponding to their perceived pruritus intensity, delineated from "no pruritus" to the extreme of "worst pruritus imaginable."Recognizing the importance of employing multiple assessment methods in clinical studies, all participants underwent classification based on the severity of their pruritus. The spectrum included categories such as "no pruritus," "mild pruritus," "moderate pruritus," "severe pruritus," and "very severe pruritus." This comprehensive approach aimed to capture the nuanced variations in participants' experiences, acknowledging that a singular measure might not fully encapsulate the diverse manifestations of pruritus.The IQ, another tool integrated into the assessment process, likely provided a more detailed and nuanced understanding of the participants' itch experiences. This combination of assessment methods not only adheres to recommended clinical practices but also enhances the study's capacity to portray a comprehensive and accurate representation of pruritus severity among pregnant women.By incorporating these meticulous

evaluation tools and embracing a multi-faceted classification system, the study sought to unravel the intricacies of pruritus experiences, thereby contributing valuable insights to the broader understanding of pruritus during pregnancy.

RESULTS

The study encompassed a cohort of 430 participants, revealing a diverse demographic profile. The mean age of the study participants stood at 32.6 ± 4.6 years, reflecting a broad range of maternal ages within the sample. Concurrently, the average gestational age was calculated at 30.4 ± 5.8 weeks, providing insight into the varying stages of pregnancy represented in the study.Within this cohort, a noteworthy 71.5% of the pregnant women identified as primiparas, signifying that this study predominantly captured the experiences of individuals undergoing their first pregnancy. Additionally, multiple pregnancies, characterized by the presence of more than one fetus, constituted 9.3% of the total female participants. This subgroup contributes a distinct perspective, recognizing the unique challenges and considerations associated with carrying multiple pregnancies.This demographic snapshot not only illustrates the diversity within the study group but also sets the stage for a nuanced exploration of pruritus during pregnancy across different maternal ages, gestational periods, and parity statuses. Such demographic insights enrich the interpretation of study findings, acknowledging the potential impact of these variables on the experiences of pruritus among pregnant women.

Table 1: Table showing distribution of study participants based on various patient characteristics

Characteristics	Without pruritus	With pruritus	P value
Age (in years)	33.2	34.6	>0.05
Gravida	1.1	0.9	>0.05
Parity	0.8	0.8	>0.05
Weeks of gestation	30.4	31.4	>0.05
Singleton pregnancies	220	118	> 0.05
Multiple pregnancies	34	60	< 0.05

Figure1: Showing distribution of study participants based on various patient characteristics

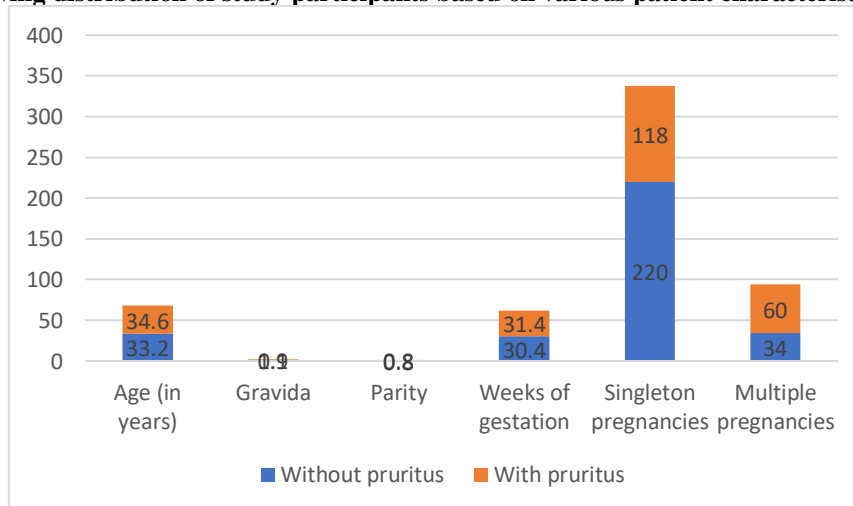


Table 2: Characteristics of itch as described by the study participants against their percentages

Characteristic against percentages	
Itch related predominant sensation	
1.	Tickling 53.5%
2.	Burning 40.1%
3.	Tingling 20.7%
4.	Pinching 20.2%
5.	Prickling 11.4%
6.	Numbness 0.9%
7.	Painful 3.3%
Subjective perception	
1.	Annoying 68.7%
2.	Burdensome 50.4%
3.	Unbearable 30.3%

The characteristics of itch-related sensations, subjective perceptions, and sleep disturbances are detailed along with their respective percentages, providing a comprehensive overview of the prevalence of each attribute in the studied population.

1. Itch-related predominant sensation:

- **Tickling (53.5%):** A significant portion of individuals (53.5%) reported tickling as the predominant sensation associated with itch.
- **Burning (40.1%):** Burning sensations were reported by 40.1% of the participants, indicating a substantial presence of this type of itch-related feeling.
- **Tingling (20.7%):** Approximately 20.7% of individuals experienced tingling as the primary sensation associated with itch.
- **Pinching (20.2%):** Pinching sensations were reported by 20.2% of the participants.
- **Prickling (11.4%):** Prickling sensations were less common but still present in 11.4% of the individuals.
- **Numbness (0.9%):** A small percentage (0.9%) reported numbness as the predominant itch-related sensation.
- **Painful (3.3%):** Painful sensations were reported by 3.3% of the participants.

2. Subjective perception:

- **Annoying (68.7%):** The majority of individuals (68.7%) perceived itch as annoying.
- **Burdensome (50.4%):** Burdensome perceptions were reported by 50.4% of the participants.
- **Unbearable (30.3%):** A significant percentage (30.3%) described itch as unbearable.
- **Worrisome (18.6%):** Approximately 18.6% of individuals found itch worrisome.

3. Trouble in sleep pattern:

- **Interruption in sleep (65.5%):** A substantial majority (65.5%) experienced interruption in sleep patterns due to itch.
- **Trouble in falling asleep (77.3%):** The majority (77.3%) reported difficulties in falling asleep related to itch.

These percentages offer valuable insights into the diverse ways individuals experience and perceive

itch-related sensations, providing a nuanced understanding of the impact on subjective well-being and sleep patterns. The data contributes to a comprehensive view of the multifaceted nature of itch-related experiences and their implications for quality of life.

DISCUSSION

Pruritus, defined as an unpleasant sensation provoking the urge to scratch, can manifest during pregnancy due to a myriad of factors, including infections, infestations, systemic disorders such as liver or kidney dysfunction, pregnancy-specific dermatoses, and the exacerbation of preexisting dermatologic conditions like atopic dermatitis.¹⁰ These diverse etiologies underscore the complexity of pruritus experiences among pregnant women, necessitating a comprehensive understanding of its various triggers. Our present study sought to delve into the landscape of pruritus during pregnancy and its association with the impairment of the quality of life related to this symptom. Recognizing the multifaceted nature of pruritus gravidarum, we aimed to explore its prevalence, manifestations, and impact on the well-being of expectant mothers. Pruritus during pregnancy can take on different forms—either localized, primarily affecting regions such as the breasts and abdomen, or generalized, extending across the entire body.¹¹⁻¹³ It may accompany specific dermatoses of pregnancy, such as pruritic urticarial papules and plaques of pregnancy (PUPPP), intrahepatic cholestasis of pregnancy (ICP), and pemphigoid gestationis (PG), yet intriguingly, it can also occur as an isolated symptom without an underlying disease. Contrary to earlier estimations, our study unveiled a higher frequency of itch during pregnancy, surpassing previous suspicions. In certain periods of pregnancy, a substantial 41.2% of pregnant women may grapple with pruritus. This finding aligns with the results of a study by Kenyon et al., which reported an overall prevalence of itch during pregnancy at approximately 23%. The consistency across studies underscores the significance of pruritus as a prevalent concern during pregnancy that warrants closer attention.¹⁴ As we unravel the prevalence and

intricacies of pruritus in the pregnant population, it becomes imperative to further investigate its underlying causes, impact on the quality of life, and potential interventions. This expanded understanding not only enhances our knowledge of dermatological aspects during pregnancy but also lays the groundwork for more targeted and effective approaches to address the diverse needs of expectant mothers grappling with pruritus.

Remarkably, our study shed light on the intriguing phenomenon that a considerable portion of pregnant women faced pruritus of unknown origin, emphasizing the complexity inherent in understanding the diverse etiologies of itching during pregnancy. While the intensity of most pregnancy-related pruritus tended to be of a moderate nature, clinicians must remain vigilant, as generalized itch with greater severity—particularly impacting the hands and feet and intensifying during the nocturnal hours—may be indicative of a more specific condition, notably intrahepatic cholestasis of pregnancy (ICP).¹⁵ This clinical insight has prompted some researchers to categorize pruritus gravidarum into subtypes, differentiating between those associated with cholestasis and those without. The enigma surrounding the cause of itch accompanying pregnancy dermatoses persists, posing challenges in both diagnosis and intervention. Although relatively infrequent, pregnancy dermatoses not only contribute to pruritus but also carry the potential for adverse outcomes for both the fetus and the expectant mother. The exploration of the link between progesterone and pruritus, especially concerning the pathophysiology of ICP, underscores the intricate hormonal dynamics at play during pregnancy. An interesting facet of our findings underscores the ubiquity of striae gravidarum, commonly known as stretch marks, affecting up to 90% of pregnant white women. Despite their prevalence, the exact origin of these marks remains elusive. It is particularly noteworthy that in some instances, pregnancy-associated striae may become the primary site of occurrence for conditions like polymorphic eruption of pregnancy (PEP), a dermatological manifestation more commonly observed in first-time pregnancies. The interwoven threads of hormonal fluctuations, dermatological adaptations, and the physiological transformations of pregnancy present a complex tapestry. Unraveling these intricacies becomes paramount not only for unraveling the underlying mechanisms but also for refining diagnostic precision and optimizing care for pregnant individuals navigating the challenges of dermatological conditions. As our understanding deepens, so too does the potential for tailored and effective interventions that can enhance the well-being of expectant mothers grappling with pruritus-related concerns.

Within the scope of our investigation, the abdomen emerged as the predominant site of pruritus, mirroring observations made by Kenyon et al. This recurrent

theme underscores the prevalence of abdominal pruritus during pregnancy, a phenomenon intricately linked to the physiological changes induced by the stretching of the abdominal skin. The stretching process, inherent to the progressive growth of the uterus and expanding abdominal dimensions during gestation, is theorized to activate dermal nerve endings, consequently giving rise to the manifestation of pruritus. Nevertheless, the precise molecular mechanisms underpinning this response remain an area of ongoing exploration within the scientific community. Additionally, there exists a hypothesis suggesting that damage to collagen during this stretching process might induce an allergic-type response, potentially contributing to the development of skin lesions observed in conditions such as polymorphic eruption of pregnancy (PEP).¹⁶ An important revelation from our study is the significant impact of pruritus during nighttime hours, affecting approximately one-fifth of pregnant women grappling with this symptom. Nocturnal itching not only presents a considerable challenge to the comfort and well-being of expectant mothers but also introduces a noteworthy risk factor, with potential implications for miscarriage. This nocturnal disruption underscores the necessity of addressing and managing nighttime pruritus comprehensively, not only to alleviate immediate discomfort but also to mitigate potential adverse outcomes associated with disrupted sleep patterns during pregnancy.

The nocturnal dimension of pruritus during pregnancy introduces a multifaceted layer to the challenges faced by expectant mothers. Beyond its impact on immediate quality of life, this aspect of pruritus could potentially influence broader maternal health outcomes and fetal well-being. Recognizing the importance of managing nighttime pruritus becomes crucial not only in the context of patient comfort but also in promoting optimal pregnancy outcomes. Therefore, exploring effective strategies to address and alleviate nighttime itching takes on heightened significance, contributing to a more holistic approach to the care of pregnant individuals navigating the complexities of dermatological challenges during this transformative period.

CONCLUSION

Effectively managing pruritus during pregnancy necessitates a comprehensive approach, beginning with a thorough patient history and a meticulous physical examination. Given the diverse potential causes of pruritus in pregnancy, further investigations, including laboratory studies, may be warranted to refine the diagnosis and guide appropriate management. Specifically, assessing liver function through liver transaminase levels and serum bile acid levels is often integral, especially when intrahepatic cholestasis of pregnancy (ICP) is suspected. In selected cases, a skin biopsy might be recommended to provide additional insights into the underlying

pathology, contributing to a more accurate diagnosis. It is imperative to consider dermatoses of pregnancy in the differential diagnosis of pruritus, given their unique characteristics and associations with gestation. These conditions, including pruritic urticarial papules and plaques of pregnancy (PUPPP), ICP, pemphigoid gestationis (PG), and atopic eruption of pregnancy (AEP), merit distinct considerations in terms of diagnosis and management. The significance of obtaining an accurate diagnosis is heightened by the fact that certain pregnancy-related dermatoses are associated with an increased risk of adverse fetal outcomes. Timely and precise identification of the underlying condition allows for tailored management strategies that not only alleviate the discomfort of pruritus but also contribute to the overall well-being of both the expectant mother and the fetus. Importantly, the treatments recommended for these dermatoses during pregnancy are generally considered safe. This assurance is crucial in guiding healthcare providers and reassuring pregnant individuals that interventions to address pruritus are unlikely to pose undue risks to the developing fetus. Collaborative and multidisciplinary care, involving obstetricians, dermatologists, and other relevant specialists, ensures a comprehensive and well-informed approach to managing pruritus during pregnancy while prioritizing the safety of both the mother and the baby.

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