Journal of Pakistan Association of Dermatologists.2024;**34(1)**:262-272.

Review Article

Specific dermatoses of pregnancy: Unraveling the enigma

Yasaan Saaqib, Shazia Saqib*, Nabeela Shahzadi, Zahid Tahir, Nadia Ali Azfar

Department of Dermatology, Gujranwala Medical College, Gujranwala.
* Department of Obstetrics and Gynaecology, Allama Iqbal Medical College, Lahore.

Abstract

Pregnancy represents a transformative phase in a woman's life, often accompanied by distinct dermatological conditions. These skin conditions comprise a spectrum of inflammatory disorders that emerge exclusively during pregnancy, triggered by the dynamic physiological and hormonal changes. These dermatoses encompass atopic eruptions of pregnancy (AEP), polymorphic eruptions of pregnancy (PEP), gestational pemphigoid (GP), obstetric cholestasis (OC), and pustular psoriasis of pregnancy (PPP). Several of these specific dermatoses of pregnancy not only impact the mother's skin but also carry potential risks for the fetus, including prematurity, intrauterine growth restriction (IUGR), and, in severe cases, fetal demise. Unfortunately, there exists limited knowledge regarding the pathogenesis, clinical manifestations and management of these specific pregnancy-related dermatoses, not only among general practitioners, who typically serve as the initial point of contact for pregnant patients, as well as dermatologists and obstetricians to whom patients are often referred. This narrative review aims to provide healthcare professionals with a comprehensive understanding of these pregnancy-specific dermatoses. By enhancing awareness and knowledge about these conditions, we aim to equip healthcare providers with the necessary information to make informed decisions and deliver improved care to pregnant women. Ultimately, this collaborative effort strives to contribute to enhanced pregnancy outcomes and the well-being of both mothers and their unborn children.

Key words
Atopic eruption of pregnancy; Polymorphic eruption of pregnancy; Pemphigoid gestationis; Intrahepatic cholestasis of pregnancy; Generalized pustular psoriasis of pregnancy.

Introduction

Specific dermatoses of pregnancy represent a diverse spectrum of inflammatory skin disorders that manifest during pregnancy or in the postpartum period, characterized by intense pruritus; some of them bear significant implications for both the mother and the fetus.[1,2] Beyond their immediate clinical impact, these dermatoses hold a propensity to recur in subsequent pregnancies, emphasizing the need for accurate patient counselling.[3]

Address for correspondence
Dr. Yasaan Saaqib
47-H, Aitchison College Staff Housing Society,
Raiwind Road, Lahore.
Ph: 032345252771
Email: saani1992222@gmail.com

Successful treatment of pregnancy-specific dermatosis depends on accurately distinguishing pregnancy-specific dermatoses from other dermatological conditions in pregnancy,[4] while also considering the potential benefits and risks associated with available treatment options.[5] Therefore, an in-depth understanding of these conditions and their potential pregnancy-related effects is crucial for effectively managing these dermatoses. Despite their clinical significance, there exists a noticeable knowledge gap among medical practitioners when it comes to diagnosing and managing these conditions. Our objective is to summarize the existing knowledge about the diagnosis, management, and fetomaternal outcomes associated with these diverse dermatoses. By doing so, we aim to

empower general practitioners, dermatologists and obstetricians with the precise information required to effectively manage these complex dermatological conditions, ultimately raising the standard of care and improving the well-being of both pregnant individuals and their unborn children.

Classification

The classification of PSD has evolved with our understanding of these conditions. In 1872, Milton described pemphigoid gestationis (PG), characterized by spreading blisters.[6] In 1962, polymorphic eruption of pregnancy (PEP) was identified, characterized by small papules on pregnant women's abdomens.[7] In 1981, Zoberman and Farmer reported a pruritic eruption that resolved after delivery. This became known as pruritic folliculitis of pregnancy (PFP) in 1983.[8]

In 1998, Shornick revised the PSD classification, removing PFP and adding intrahepatic cholestasis of pregnancy (ICP), resulting in a classification of PG, PEP, PP, and ICP.[9] In 2006, Ambros-Rudolph et al. grouped EP, PG, and PFP due to their shared characteristics, as "atopic eruption of pregnancy (AEP)".[10] They also excluded impetigo herpetiformis from their classification as a variant of pustular psoriasis, leaving four main categories of pregnancy-specific dermatosis: AEP, PEP, PG and ICP.[10]

Generalized pustular psoriasis of pregnancy (GPPP), a rare skin condition first described in the late 19th century, is now recognized as the fifth specific PSD.[11] Its timely diagnosis and treatment are crucial. However, there is ongoing debate about whether it should be classified as a separate medical condition or a disease variant.

1. Atopic eruption of pregnancy (AEP)

The most frequently encountered specific

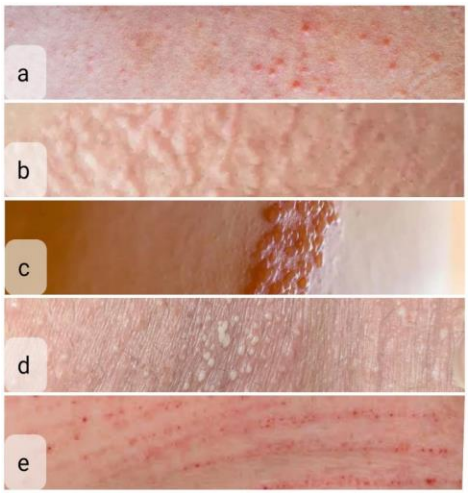

Figure 1 (a) Atopic eruption of pregnancy, scattered small erythematous papules. Note the absence of striae distensae. (b) Polymorphic eruption of pregnancy, initially manifests as urticarial lesions on the abdominal striae. (c) Pemphigoid gestationis. Vesicles on the abdomen. (d) Generalized pustular psoriasis of pregnancy, diffuse erythema studded with pustules few discrete most of them coalescing to form lakes of pus. (e) Intrahepatic cholestasis of pregnancy, skin excoriation without primary lesions.

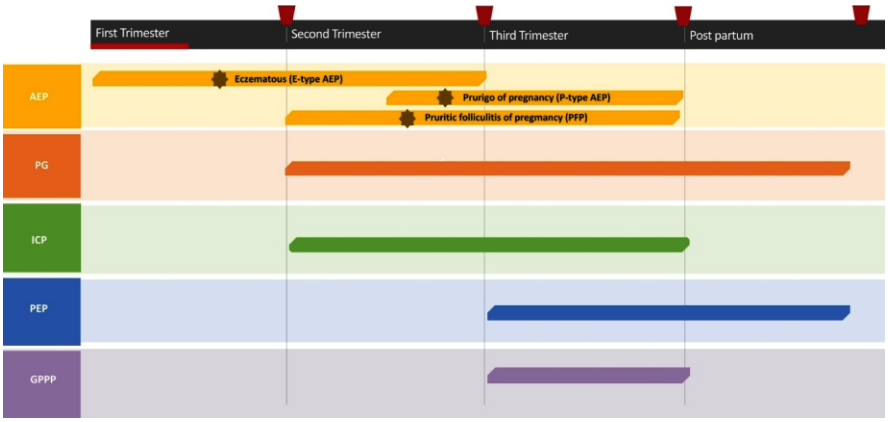

Figure 2 Pathological timeline: AEP (Atopic Eruption of Pregnancy), PG (Pemphigoid Gestationis), ICP (Intrahepatic Cholestasis of Pregnancy), PEP (Polymorphic Eruption of Pregnancy), GPPP (Generalized Pustular Psoriasis of Pregnancy).

dermatosis of pregnancy is AEP, accounting for approximately 50% of cases.[4] AEP typically presents as a benign pruritic disorder characterized by eczematous or papular skin lesions.[12]

The onset of AEP is thought to be triggered by pregnancy-specific changes in the immune system. These changes involve a reduction in cellular immunity and diminished production of Th1 cytokines, including IL-2, interferon gamma, and IL-12, alongside an increased prevalence of humoral immunity and elevated secretion of Th2 cytokines like IL-4 and IL-10.[4]

The diagnosis of AEP is primarily clinical, based on the characteristic presentation of pruritic eczematous or papular lesions in a pregnant woman with a history of atopy.[12] Laboratory tests, such as measuring IgE levels, may be useful in supporting the diagnosis and excluding other dermatoses.[5]

Treatment for AEP focuses on relieving symptoms and minimizing discomfort for the pregnant woman. Emollients and topical corticosteroids are commonly used to alleviate pruritus and reduce inflammation.[12] Antihistamines may also be prescribed to help manage itching.[5]

It is important to consider the safety of medications during pregnancy and provide appropriate treatment options, taking into consideration any coexisting medical disorder.

AEP is generally considered a mild condition with minimal impact on both maternal and fetal well-being. However, further research is needed to investigate potential long-term effects on infants born to mothers with AEP, including potential links to atopic skin changes later in life.[13]

Sub-types of AEP

AEP encompasses eczema in pregnancy, prurigo of pregnancy," and "pruritic folliculitis of pregnancy."

a) Eczematous AEP (E-type AEP) Eczematous AEP primarily targets primiparous women during the early to mid-pregnancy phase. This subset of AEP notably encompasses a substantial 80% of cases that are marked by the onset of eczema symptoms in individuals with a history of sensitive skin. Often, familial antecedents of eczema, asthma, or hay fever are conspicuously present in the clinical histories of these patients. It is noteworthy that in approximately 20% of cases, individuals with pre-existing eczema witness an exacerbation of their condition during pregnancy.[10,14,15]

The clinical presentation of Eczematous AEP is characterized by a widespread rash of a dry, scaly, erythematous nature, typically associated with intense pruritus. This manifestation conventionally localizes to the face, neck, as well as the inner folds of the elbows and behind the knees. Elevated serum immunoglobulin E (IgE) levels are frequently discerned within this clinical subtype. While studies generally support

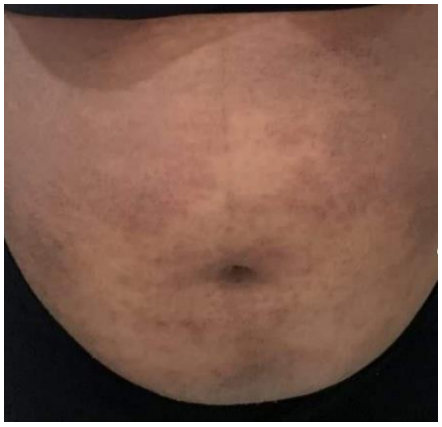

Figure 3 Eczematous atopic eruption of pregnancy. Patient with pre-existing atopic dermatitis, experienced aggravated symptoms in the latter half of pregnancy.

the main findings, it's important to recognize that variations in symptom severity and clinical presentation may exist among individuals. Further research may be needed to explore these potential variations in greater detail.

b) Prurigo of pregnancy (P-type AEP) Prurigo of Pregnancy, a subset of Atopic Eruption of Pregnancy (AEP), affects approximately 1 in 300 pregnancies.[16,17] It's characterized by severely itchy papulonodular lesions, mainly on the abdomen and limbs, with almost all extremities affected in about 95% of cases.[17–19] According to a review, the onset of Prurigo of Pregnancy is commonly observed during the late second trimester of pregnancy and may persist until delivery.[17]

This finding may indirectly support the notion that hormonal changes and immune system alterations during pregnancy may contribute to the development of this condition. The exact mechanisms underlying the onset of the disease process during this specific period require further investigation.

Prurigo of pregnancy involves 0.5–1cm papules, sometimes with a central crust and possible pustules, primarily on the upper body. It's a clinical diagnosis, and its histopathology is non-specific with negative immunofluorescence. It's often underreported due to potential confusion with acne or folliculitis.[20] Accurate diagnosis of the disease depends on thorough patient medical history analysis, with attention to family history of atopic conditions, and IgE level assessments should be considered alongside clinical findings. However, it is important to note that PP can develop in patients without an atopic background.[17] IgE level assessments have been shown to support the diagnostic process, although they should be interpreted in conjunction with other clinical findings.

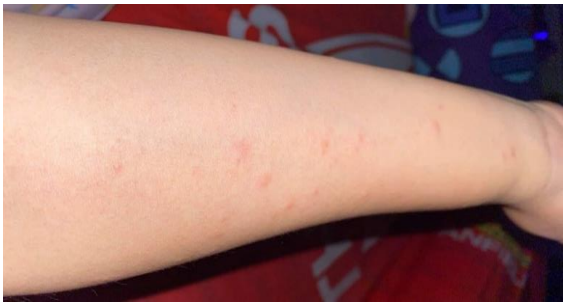

Figure 4 P-type atopic eruption in pregnancy (previously prurigo of pregnancy) on forearm. Multiple discrete, scratched bumps favoring extensor surfaces.

Interestingly, the fetal outcomes in cases of Prurigo of Pregnancy generally remain unremarkable, with limited instances of postpartum recurrence.[17,18,21] While these studies generally support the main findings, it's important to recognize that individual variations in symptom severity and clinical presentation may exist. Further research may explore these potential variations in greater depth.

c) Pruritic Folliculitis of Pregnancy (PFP) Pruritic Folliculitis of Pregnancy (PFP) is a rare pregnancy-related condition characterized by pruritic follicular papules or pustules, often mistaken for acne; it typically occurs in the second trimester with an incidence of 1 in 3,000 pregnancies.[16,19,22] The eruption commonly manifests during the second and third trimesters on shoulders, back, arms, chest, and abdomen.[17,23,24] Generally, it resolves within a couple of months after childbirth, without significant maternal or fetal complications.[25] In the most extensive study of individuals diagnosed with PFP, a reduction in birth weight was noted, and the ratio of male to female cases was 2:1. Treatment for PFP includes the use of topical low-potency corticosteroids, topical benzoyl peroxide 10%, and ultraviolet B phototherapy.[24]

While the existing body of research provides a comprehensive clinical description and timing of onset for Pruritic Folliculitis of Pregnancy, as

well as the favorable resolution of the condition postpartum, it is important to acknowledge the limitations stemming from the limited number of studies available on PFP. Further investigations would offer additional perspectives on the clinical course, management, and potential complications of this unique subset of AEP.

Atopic eruption of pregnancy is managed with topical corticosteroids as the primary treatment, reserving systemic corticosteroids or antihistamines for severe cases, while maintaining skin hydration with emollients and avoiding triggers during pregnancy. A recent case report presented a case of severe atopic dermatitis treated with dupilumab during pregnancy, demonstrating its safe, use with no adverse effects observed in the mother or fetus. This emphasizes the importance of a thorough risk-benefit assessment and participation in pregnancy registry studies for patients exposed to dupilumab during pregnancy and lactation.[26]

2. Polymorphic eruption of pregnancy (PEP)

Polymorphic Eruption of Pregnancy (PEP) is a common skin condition in pregnant women, affecting 1 in 160 to 200 pregnancies.[27] Regarding the etiology of PUPPP, the literature is deficient because of underreported cases and the lack of randomized controlled studies. Various risk factors of PEP have been identified, including Rh incompatibility, excessive maternal

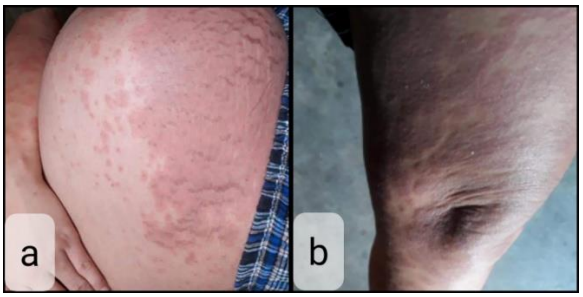

Figure 5 Polymorphic eruption of pregnancy. Note urticaria within striae on the abdomen (a) and on the thighs (b).

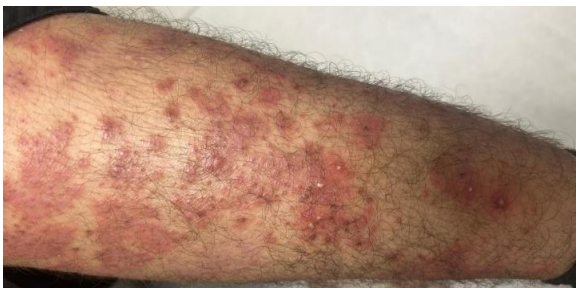

Figure 6 Polymorphic eruption of pregnancy. Merging erythematous hives with pustules, resolved 2 weeks postpartum.

weight gain, first pregnancies, and multifetal pregnancies.[28] Triplet pregnancies carry a higher risk (14%) of PEP than twin pregnancies (2.9%).[29] Hormonal factors, abdominal distention due to either fetal macrosomia or polyhydramnios, a male fetus, and placental factors have also been observed, but a final decision on the exact pathogenesis of PUPPP could not be drawn.[10,30,31] Previously, PEP has also been linked to in vitro fertilization (IVF) pregnancies and prolonged progesterone use.[32]

The pathophysiology of PEP involves increased vascularity and hormonal influences, with a notable association between the severity of the condition and a history of atopy.[32] PEP typically starts as red stretch marks on the abdomen, sparing the navel, and can later spread to the thighs, breasts, and arms. Notably, the face, palms, soles, and mucosal areas are usually unaffected. Initially, PEP appears as small, itchy erythematous macules that can evolve into urticaria with pale rings, sometimes resembling eczematous or target-like lesions. It typically begins in the final trimester of pregnancy, originates from abdominal stretch marks, and often resolves after childbirth.

Diagnosing PEP relies on visual inspection due to the absence of specific lab abnormalities.[30] Treatment for polymorphic eruption of pregnancy (PEP) primarily focuses on symptom relief, employing general measures such as cool baths, wet soaks, and wearing cotton clothing to

alleviate itching and soreness.[28] Moisturizing techniques involving bath moisturizers, soap substitutes, and frequent use of emollients are recommended to maintain skin moisture. Topical corticosteroids should be applied thinly once or twice daily to the red, itchy patches, while systemic corticosteroids like prednisone are reserved for severe cases. Antihistamines like chlorpheniramine, loratadine, and cetirizine are commonly prescribed to ease pruritus, though they may cause drowsiness in newborns during delivery. The overall goal is to reduce itching and skin inflammation (pruritus) in PEP patients. PEP typically resolves within 7-10 days postpartum, with limited impact on maternal and neonatal outcomes, despite its link to pregnancy-induced hypertension.[33]

3. Pemphigoid gestationis (Syn. herpes gestationis)

Gestational Pemphigoid (PG), a rare autoimmune skin disorder occurring during pregnancy, belongs to the pemphigoid group of blistering skin conditions.[12] This distinctive rash predominantly originates in the periumbilical region, encompassing the belly button, in approximately 90% of cases, and subsequently spreads to other areas of the body.[18,34] Notably, the lower limbs consistently exhibit involvement, while the extent of trunk participation may vary.[35] Itchiness constitutes a prominent and bothersome symptom of PG. It most commonly occurs in the third trimester, but it can occur in the second trimester and postpartum as well. It reoccurs with earlier onset and a more severe course in subsequent pregnancies. PG displays a characteristic pattern of remission and relapse during pregnancy, often getting better in late pregnancy but potentially worsening around delivery in 75% of cases. A critical point in diagnosis is distinguishing PG from polymorphic eruption of pregnancy (PEP), another condition that manifests as an itchy rash but does not affect the umbilical region.[18] Fortunately, for most patients, PG tends to ameliorate following childbirth, with about 75% experiencing an improvement in their skin condition.[34]

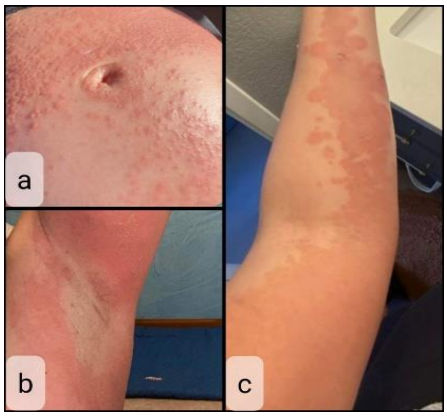

Figure 7 Pemphigoid gestationis: Urticarial lesions that typically occurs in late pregnancy, starting near the umblicus (a) and spreading to the trunk and arms over days to weeks. In this patient, the axilla is spared (b,c).

Contrary to other types of pregnancy-specific dermatoses, disease severity (related to early onset and blister formation) has an adverse implication on pregnancy outcome; contrasting previous beliefs that corticosteroid treatment played a more significant role.[18] Babies born to mothers with PG may exhibit mild skin issues due to the transfer of antibodies from the mother to the fetus, although these typically resolve naturally within days to weeks.[36] While secondary autoimmune diseases are rare, they can occur, with Grave's disease being the most frequently.[9,37] In extremely rare cases, PG has been associated with hydatidiform moles and choriocarcinoma.[37]

Postpartum, skin issues usually resolve within weeks to months, with occasional recurrences possibly tied to menstruation or hormonal contraception. Severe and persistent skin complications are uncommon, and fetal outcomes are generally positive, despite occasional reports of premature births and small-for-date infants.[35]

4. Obstetric cholestasis of pregnancy (Syn. intrahepatic cholestasis of pregnancy)

Obstetric cholestasis, or intrahepatic cholestasis of pregnancy (ICP), represents a clinical concern encountered in pregnancy. This condition typically presents itself with distinctive symptoms, notably pruritus, elevated serum aminotransferases, and an increase in bile acid levels, particularly in the latter stages of gestation.[38] The redeeming aspect of this ailment is that these distressing symptoms generally ameliorate after childbirth.[38] The prevalence of ICP exhibits variability, impacting approximately 1 in every 50 to 5,000 pregnancies.[39] Nevertheless, certain ethnic groups, particularly those of Pakistani and Indian descent, appear to be more susceptible to the condition.[38,40]

The hallmark of ICP is the sudden onset of intense itching, often originating on the palms and soles, which gradually disseminates as the pregnancy advances. Crucially, it is noteworthy that ICP does not evoke primary skin lesions; instead, it precipitates an evolving clinical presentation. Initially, the skin may exhibit no discernible changes, but persistent itching can result in secondary lesions, ranging from minor abrasions to the emergence of pruritic nodules.[36]

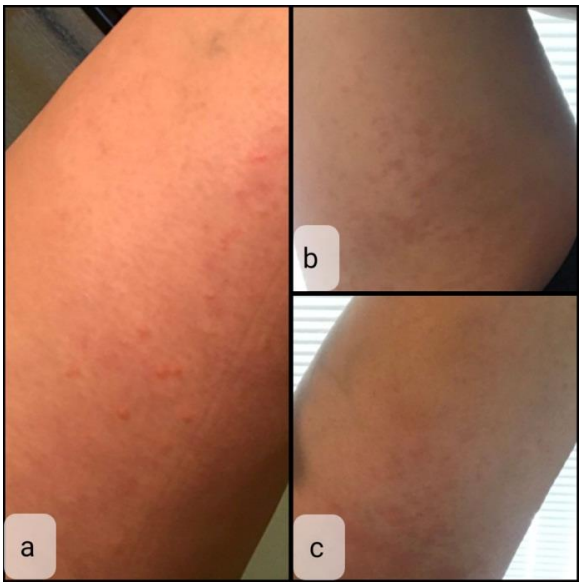

Figure 8 Intrahepatic cholestasis of pregnancy: Distressing third-trimester pruritus leaves behind erythematous excoriation marks on the inner thighs (a) and underarms (b,c).

Approximately 10% of individuals affected by ICP may exhibit cholestatic jaundice, a condition characterized by pale stools and darkened urine. Malabsorption, a consequence of ICP, can give rise to a reduction in vitamin K levels, thereby augmenting the propensity for bleeding, as indicated by prolonged prothrombin time. Furthermore, ICP is associated with a 2.7-fold increase in the risk of gallstone formation in comparison to pregnancies devoid of cholestasis.[41] From a fetal perspective, ICP imparts certain risks, including premature birth, meconium staining, bradycardia, fetal distress, and, in severe instances, fetal loss. The likelihood of these complications escalates when fasting serum bile acid levels surpass the 40 μmol/L threshold.[42]

Research studies have unveiled that the incidence of stillbirth surges when serum bile acid levels escalate to 100 μmol/L or higher. However, it is pertinent to acknowledge that a majority of ICP patients exhibit bile acid levels below this critical threshold. Vigilant monitoring of bile acid levels before delivery serves as a reassuring practice concerning stillbirth risk, aligning with the general risks inherent in pregnancy.[43] Ordinarily, ICP tends to resolve within a span of six weeks following childbirth.

The management of ICP primarily revolves around the reduction of bile acid levels, aimed at alleviating pruritus, prolonging pregnancy, and mitigating fetal risks. The preferred therapeutic intervention entails the administration of ursodeoxycholic acid (UDCA) at a recommended dosage of 15 mg/kg/day. It is noteworthy that the utility of UDCA in averting

stillbirth remains a subject of debate, with limited evidence to support its efficacy in this regard from one study. Nevertheless, recent guidelines have advocated for the use of UDCA, thereby challenging the findings of the aforementioned study. In severe instances of ICP, the administration of a combination therapy involving UDCA and rifampicin is a matter of contention. Additionally, early induction of labor, typically recommended after the 37th week of gestation, especially when confronted with elevated bile acid levels, is often contemplated as a proactive measure to safeguard maternal and fetal well-being.

5. Generalized pustular psoriasis of pregnancy (Syn. impetigo herpetiformis)

Impetigo herpetiformis is a rare variant of generalized pustular psoriasis typically seen in the third trimester.[44] It primarily affects skin folds and the periumbilical area, resulting in sterile pustules and concentric rings around the umbilicus. Diagnosis involves clinical evaluation, blood tests, and possible skin biopsies.

Pregnant individuals with this condition experience severe constitutional symptoms,

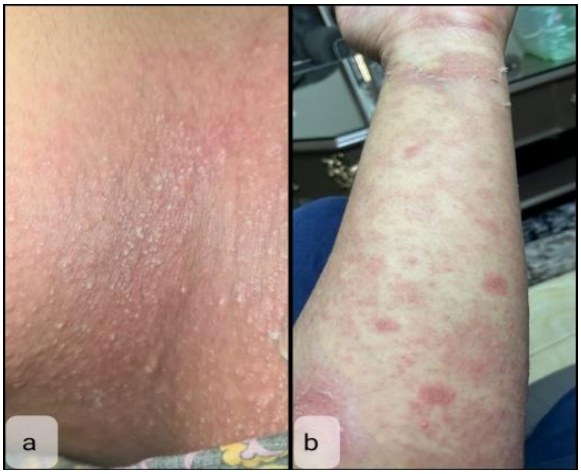

Figure 9 Pustular Psoriasis of Pregnancy: Pink annular plaques with sterile pustules on the periphery, (a) on the abdomen, (b) on the forearm.

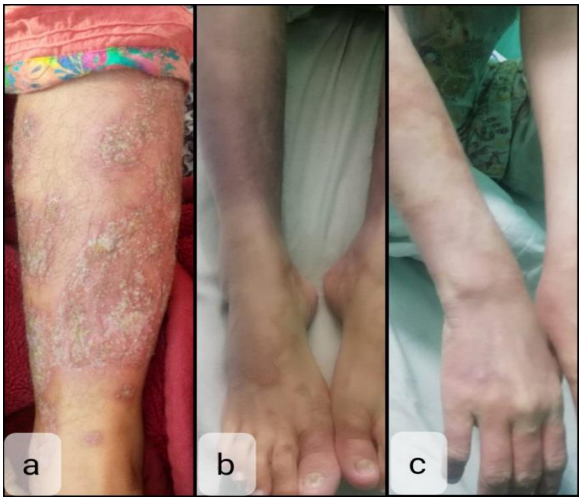

Figure 10 Pustular psoriasis of pregnancy: (a) Another patient, presented with “lakes of pus” on erythematous plaques. (b,c) Post flare healing.

including fever, arthralgia, and gastrointestinal issues, often revealing hypoalbuminemia and hypocalcemia in blood tests, increasing the risk of cardiac or renal failure. It may also lead to complications like erythroderma and intrauterine growth retardation.[45] Placental insufficiency raises the risk of stillbirth, and the condition often reoccurs in subsequent pregnancies, usually more severely, with symptom-free intervals.

Managing pustules can be challenging. Corticosteroids show varying success, while cyclosporin is an effective, low-risk treatment. Postpartum, systemic therapy may be needed for inflammation control. Treatments include general measures and specific interventions, such as narrowband UVB phototherapy, systemic corticosteroids, ciclosporin, or tumor necrosis factor-alpha inhibitors.[46] In severe cases, early delivery may be considered. The prognosis is generally positive, with rapid resolution after childbirth, though some long-term psoriasis changes may persist.[47] However, there's a risk of earlier and more severe recurrence in subsequent pregnancies, leading to a poor prognosis for both mother and fetus if untreated.

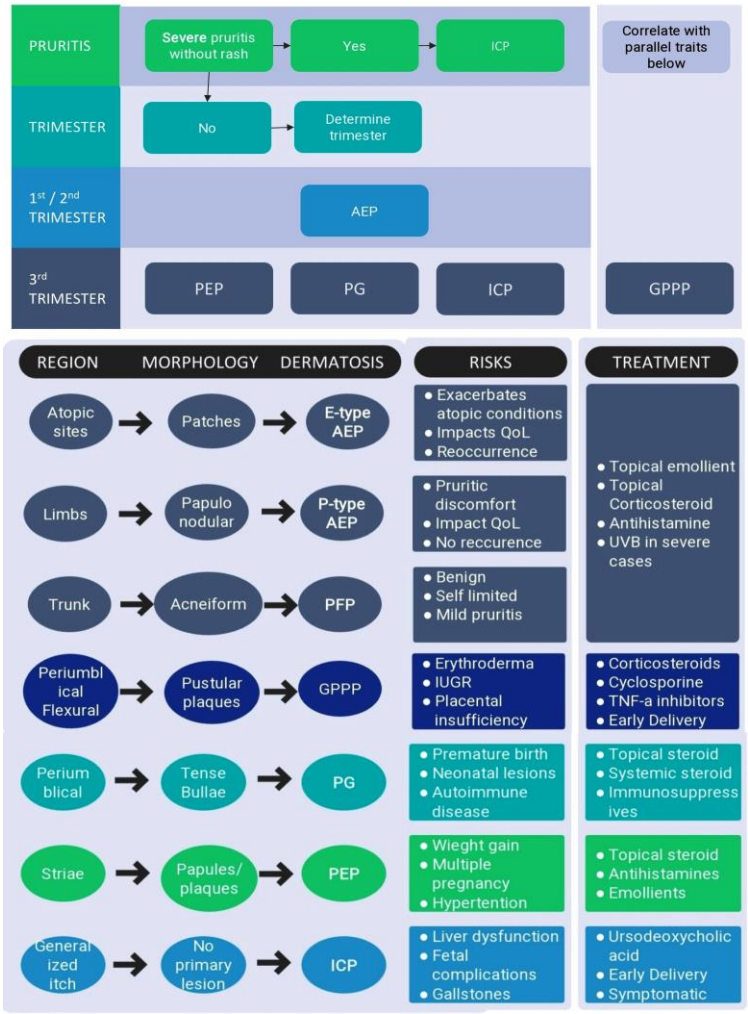

Figure 11 Algorithm for Pregnancy-Specific Dermatoses: AEP (Atopic Eruption of Pregnancy), PFP (Pruritic Folliculitis of Pregnancy), GPPP (Generalized Pustular Psoriasis of Pregnancy), PG (Pemphigoid Gestationis), PEP (Polymorphic Eruption of Pregnancy), ICP (Intrahepatic Cholestasis of Pregnancy).

This comprehensive study presents five main types of pregnancy-specific dermatoses: atopic eruption of pregnancy, polymorphic eruption of pregnancy, pemphigoid gestationis, intrahepatic cholestasis of pregnancy and generalized pustular psoriasis of pregnancy. It describes their clinical features, risk factors, and management strategies, which often focus on alleviating symptoms, monitoring maternal-fetal well-being, and appropriate interventions using corticosteroids, emollients, and other therapies. Conditions like intrahepatic cholestasis of pregnancy, generalized pustular psoriasis of pregnancy and pemphigoid gestationis pose risks like preterm delivery and stillbirth. The study emphasizes that early diagnosis and intervention are important to reduce symptoms and improve outcomes. However, large studies are limited, restricting conclusions about each dermatosis. This highlights the need for continued research through clinical trials, investigations into new treatments, and understanding pathogenic mechanisms to better care for women facing these dermatological challenges during pregnancy.

Acknowledgement

The authors are grateful to the researchers whose studies were included in this article.

References

1. Naz S, Khan S,. M, Abbasi S, . Y, Muzaffar Ali Joyo R. A Study of Specific Dermatoses and Skin Disease Affected by Pregnancy. *Pakistan J Med Heal Sci*. 2022;**16(3)**:1157–9.
2. Sachdeva S. The dermatoses of pregnancy. *Indian J Dermatol*. 2008;53(3):103–5.
3. Kurien G, Badri T. Dermatoses of Pregnancy. 2023
4. Vora R, Gupta R, Mehta M, Chaudhari A, Pilani A, Patel N. Pregnancy and skin. *J Fam Med Prim Care*. 2014;**3(4)**:318.
5. Stefaniak AA, Pereira MP, Zeidler C, Ständer S. Pruritus in Pregnancy. *Am J Clin Dermatol*. 2022;**23(2)**:231–46. Available from: https://doi.org/10.1007/s40257-021-00668-7
6. Thomas S, Rajan U, George S, George M. Postpartum pemphigoid gestationis. *Indian J Dermatol*. 2012;**57(2)**:146–8.
7. Kroumpouzos G, Cohen LM. Dermatoses of pregnancy. *J Am Acad Dermatol*. 2001;**45(1)**:1–22.
8. Holmes RC, Black MM. The specific dermatoses of pregnancy. *J Am Acad Dermatol*. 1983;**8(3)**:405–12.
9. Shornick JK, Black MM. Secondary autoimmune diseases in herpes gestationis (pemphigoid gestationis). *J Am Acad Dermatol*. 1992;**26(4)**:563–6.
10. Ambros-Rudolph CM, Müllegger RR, Vaughan-Jones SA, Kerl H, Black MM. The specific dermatoses of pregnancy revisited and reclassified: Results of a retrospective two-center study on 505 pregnant patients. *J Am Acad Dermatol*. 2006;**54(3)**:395-404.
11. Romiti R, Hirayama AL da S, Arnone M, Magalhães RF. Generalized pustular psoriasis (von Zumbusch). *An Bras Dermatol*. 2022;**97(1)**:63–74.
12. Sävervall C, Sand FL, Thomsen SF. Pemphigoid gestationis: Current perspectives. *Clin Cosmet Investig Dermatol*. 2017;**10**:441–9.
13. Maglie R, Quintarelli L, Verdelli A, Fabbri P, Antiga E, Caproni M. Specific dermatoses of pregnancy other than pemphigoid gestationis. *G Ital di Dermatologia e Venereol*. 2019;**154(4)**:286–98.
14. Vaughan Jones SA, Black MM. Pregnancy dermatoses. *J Am Acad Dermatol*. 1999;**40(2 Pt 1)**:233–41.
15. J. Ring, B. Przybilla TR. Handbook of Atopic Eczema. Handb Atopic Eczema. 2006.
16. Roger D, Vaillant L, Fignon A, Pierre F, Bacq Y, Brechot JF, et al. Specific Pruritic Diseases of Pregnancy: A Prospective Study of 3192 Pregnant Women. *Arch Dermatol*. 1994;**130(6)**:734–9.
17. Ravelli FN, Goldust M, Kroumpouzos G. Assessment of prurigo of pregnancy in patients without atopic background. Int J Women's Dermatology. 2020;6(5):384–9.
18. Cobo MF, Santi CG, Maruta CW, Aoki V. Pemphigoid gestationis: Clinical and laboratory evaluation. *Clinics*. 2009;**64(11)**:1043–7.
19. Kroumpouzos G, Cohen LM. Pruritic folliculitis of pregnancy. *J Am Acad Dermatol*. 2000;**43(1)**:132–4.
20. Sun K. Special types of folliculitis which should be differentiated from acne. *Dermatoendocrinol*. 2018;**9(1)**:e1356519.
21. Kroumpouzos G, Cohen LM. Specific dermatoses of pregnancy: An evidence-based systematic review. *Am J Obstet Gynecol*. 2003;**188(4)**:1083–92.
22. Hassan I, Bashir S, Taing S. A clinical study of the skin changes in pregnancy in Kashmir valley of north India: A hospital based study. *Indian J Dermatol*. 2015;**60(1)**:28–32.
23. Zoberman E, Farmer ER. Pruritic folliculitis of pregnancy. *Obstet Gynecol Surv*. 1981;**36(9)**:484–5.
24. Kroumpouzos G. Specific dermatoses of pregnancy: Advances and controversies. *Expert Rev Dermatol*. 2010;**5(6)**:633–48.
25. Vaughan Jones SA, Hern S, Nelson-Piercy C, Seed PT, Black MM. A prospective study of 200 women with dermatoses of pregnancy correlating clinical findings with hormonal and immunopathological profiles. *Br J Dermatol*. 1999;**141(1)**:71–81.
26. Akhtar NH, Khosravi-Hafshejani T, Akhtar D, Dhadwal G, Kanani A. The use of dupilumab in severe atopic dermatitis during pregnancy: a case report. *Allergy Asthma Clin Immunol*. 2022;**18(1)**:1–3. Available from: https://doi.org/10.1186/s13223-022-00650-w
27. Pardo EF, Fulgencio-Barbarin J Polymorphic eruption of pregnancy. *Progresos Obstet y Ginecol*. 2020;**63(5)**:278.
28. Chouk Chourouk; Litaiem Noureddine. Pruritic urticarial papules and plaques of

pregnancy [Internet]. StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. 2023. Available from: https://www.ncbi.nlm.nih.gov/books/NBK539700/

29. Elling S V., McKenna P, Powell FC. Pruritic urticarial papules and plaques of pregnancy in twin and triplet pregnancies. *J Eur Acad Dermatol Venereol*. 2000;**14(5)**:378–81.
30. Mehedintu C, Isopescu F, Ionescu OM, Petca A, Bratila E, Cirstoiu MM, et al. Diagnostic Pitfall in Atypical Febrile Presentation in a Patient with a Pregnancy-Specific Dermatosis-Case Report and Literature Review. Medicina (Kaunas). 2022;**58(7)**:847.
31. Taylor D, Pappo E, Aronson IK. Polymorphic eruption of pregnancy. *Clin Dermatol*. 2016;**34(3)**:383–91.
32. de Lourdes Ribeiro de Carvalho M, Magalhães GM, Leite HV. Update on specific dermatoses of pregnancy. *Rev Assoc Med Bras (1992)*. 2023;**69 (Suppl 1)**: e2023S109.
33. Zejnullahu VA, Zejnullahu VA. Polymorphic eruption of pregnancy. *Dermatol Rep*. 2023;**15(1)**:8–13.
34. Ceryn J, Siekierko A, Skibińska M, Doss N, Narbutt J, Lesiak A. Pemphigoid gestationis – case report and review of literature. *Clin Cosmet Investig Dermatol*. 2021;**14(Cdc)**:665–70.
35. Hallaji Z, Mortazavi H, Ashtari S, Nikoo A, Abdollahi M, Nasimi M. Pemphigoid gestationis: Clinical and histologic features of twenty-three patients. *Int J Women's Dermatol*. 2017;**3(2)**:86–90.
36. Ambros-Rudolph CM. Dermatoses of pregnancy - Clues to diagnosis, fetal risk and therapy. *Ann Dermatol*. 2011;**23(3)**:265–75.
37. Jenkins RE, Hern S, Black MM. Clinical features and management of 87 patients with pemphigoid gestationis. *Clin Exp Dermatol*. 1999;**24(4)**:255–9.
38. Pusl T, Beuers U. Intrahepatic cholestasis of pregnancy. *Orphanet J Rare Dis*. 2007;**2(1)**:1–6.
39. Sumit K, Ajay K, Varma SP. Pregnancy and skin. *J Obstet Gynecol India*. 2012;**62(3)**:268–75.
40. Ozkan S, Ceylan Y, Ozkan OV, Yildirim S. Review of a challenging clinical issue: Intrahepatic cholestasis of pregnancy. *World J Gastroenterol*. 2015;**21(23)**:7134–41.
41. Geenes V, Williamson C. Intrahepatic cholestasis of pregnancy. *World J Gastroenterol*. 2009;**15(17)**:2049–66.
42. Martinefski M, Contin M, Lucangioli S, Di Carlo MB, Tripodi V. In Search of an Accurate Evaluation of Intrahepatic Cholestasis of Pregnancy. *Scientifica (Cairo)*. 2012;**2012(Cdc)**:1–6.
43. Ovadia C, Seed PT, Sklavounos A, Geenes V, Di Illio C, Chambers J, et al. Association of adverse perinatal outcomes of intrahepatic cholestasis of pregnancy with biochemical markers: results of aggregate and individual patient data meta-analyses. *Lancet*. 2019;**393(10174)**:899–909.
44. Trivedi MK, Vaughn AR, Murase JE. Pustular psoriasis of pregnancy: Current perspectives. *Int J Womens Health*. 2018;**10**:109–15.
45. Ennouri M, Bahloul E, Sellami K, Marrakchi S, Fakhfakh F, Turki H, et al. Pustular psoriasis of pregnancy: Clinical and genetic characteristics in a series of eight patients and review of the literature. *Dermatol Ther*. 2022;**35(8)**:e15593.
46. Seishima M, Fujii K, Mizutani Y. Generalized Pustular Psoriasis in Pregnancy: Current and Future Treatments. *Am J Clin Dermatol*. 2022;**23(5)**:661–71.
47. Pitch M, Somers K, Scott G, Tausk F, Mercurio MG. A case of pustular psoriasis of pregnancy with positive maternal-fetal outcomes. *Cutis*. 2018;**101(4)**:278–80.