IJRAR.ORG E-ISSN: 2348-1269, P-ISSN: 2349-5138

INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS (IJRAR) | IJRAR.ORG

An International Open Access, Peer-reviewed, Refereed Journal

PRURITIC URTICARIAL PAPULES AND PLAQUES OF PREGNANCY(PUPPP)

Geethu JB

Associate Professor in OBG Nursing

Kerala University Of Health Sciences, Kerala

Introduction

Pruritic urticarial papules and plaques of pregnancy (PUPPP), also termed polymorphic eruption of pregnancy (PEP), is the most common specific dermatosis of pregnancy. It is a benign, self-limiting inflammatory skin disorder characterized by intensely pruritic papules and plaques occurring in otherwise healthy pregnant women. Laboratory investigations are typically within normal limits, and direct immunofluorescence studies are negative, helping to distinguish PUPPP from other pregnancy-related dermatoses.

PUPPP most frequently occurs in primigravida women during the third trimester of pregnancy. It is rarely observed in the postpartum period and shows minimal tendency to recur in subsequent pregnancies.

Clinical Features

The characteristic rash begins as small, erythematous, edematous, and intensely pruritic papules, which commonly arise within the abdominal striae. A notable feature is sparing of the periumbilical region. These papules may merge to form urticarial plaques over time.

As the condition progresses, lesions may extend to involve the thighs, buttocks, breasts, and upper extremities. In individuals with lighter skin tones, lesions often appear pink to red, while in darker skin tones they may be hyperpigmented or skin-colored.

Pruritus is often severe and may significantly disturb sleep and daily activities.

In advanced stages, the eruption becomes polymorphic, with the appearance of diffuse erythema, targetoid lesions, vesicles, and eczematous patches. Mucosal involvement is typically absent, and the face, palms, and soles are usually spared.

Resolution generally occurs spontaneously within four to six weeks or shortly after delivery. Healing does not result in scarring or post-inflammatory pigmentation.

Recurrence in future pregnancies is uncommon.

Etiology And Pathogenesis

The precise etiology of PUPPP remains unknown. Several theories have been proposed to explain its development. One widely accepted hypothesis suggests that excessive abdominal distension during late pregnancy leads to connective tissue damage within the striae, exposing collagen antigens that trigger an inflammatory response.

Rapid stretching of the skin, particularly in multiple gestations, may contribute to the onset of lesions. Another theory implicates fetal microchimerism, where fetal DNA deposited in maternal skin during the third trimester provokes an immune-mediated reaction, especially in areas of increased vascularity and damaged collagen.

Hormonal factors also appear to play a role. Elevated progesterone levels and increased progesterone receptor expression have been demonstrated in affected patients. Additionally, placental hormone–induced fibroblast proliferation has been suggested as a contributing mechanism.

Generalization of lesions may occur due to immune cross-reactivity against collagen in clinically normal skin. The low recurrence rate in subsequent pregnancies may be explained by the development of immune tolerance.

Epidemiology

The incidence of PUPPP is approximately 0.5% in singleton pregnancies. The frequency increases significantly in multiple gestations, ranging from 2.9% to 16% in twin pregnancies and up to 17% in triplet pregnancies.

The condition predominantly affects primigravida women and rarely relapses in later pregnancies. Studies have shown associations between excessive maternal weight gain, increased neonatal birth weight, and the occurrence of PUPPP. There is usually no family history, autoimmune predisposition, or specific HLA association.

Histopathology

Histopathological examination of early lesions reveals edema of the epidermis and upper dermis, along with focal mild spongiosis. A perivascular lymphohistiocytic infiltrate is present in the deeper dermis, sometimes resembling arthropod bite reactions.

The inflammatory infiltrate predominantly consists of T-helper lymphocytes with variable numbers of eosinophils and neutrophils. In resolving lesions, acanthosis with hyperkeratosis and parakeratosis may be observed.

Direct immunofluorescence studies are typically negative. However, minimal nonspecific granular deposition of immunoglobulins such as IgM, IgA, or complement component C3 along the dermoepidermal junction or blood vessels has occasionally been reported. Indirect immunofluorescence for circulating IgG antibodies is almost always negative.

Diagnosis

The diagnosis of PUPPP is primarily clinical and based on characteristic morphology, distribution of lesions, and timing during pregnancy. Routine laboratory investigations are generally within normal limits.

Recommended investigations include:

- Complete blood count
- Liver function tests
- Basic metabolic panel (blood glucose, blood urea nitrogen, creatinine, calcium, and electrolytes)
- Serum cortisol levels
- Serum human chorionic gonadotropin (hCG)
- Direct immunofluorescence when differentiation from pemphigoid gestationis is required

Assessment of the severity of pruritus is essential, as management is largely symptomatic. Maternal weight gain and fetal growth should be monitored throughout pregnancy. PUPPP alone is not an indication for early delivery.

Management

Management of PUPPP focuses on symptomatic relief. Most patients achieve satisfactory improvement with topical corticosteroids and oral antihistamines.

First-generation sedating antihistamines are considered safe during pregnancy and may be useful in relieving nocturnal pruritus. In severe cases associated with sleep disturbance and maternal exhaustion, a short course of systemic corticosteroids may be administered under medical supervision.

Supportive measures such as cool baths, frequent application of emollients, and wearing loose, light cotton clothing provide additional comfort. Recent reports have described the use of intramuscular autologous whole blood injections in postpartum PUPPP, showing subjective and objective improvement, though further studies are required.

Differential Diagnosis

The most important condition to exclude is pemphigoid gestationis, which typically presents earlier in pregnancy, involves the umbilical region, and shows positive immunofluorescence findings.

Other conditions to consider include:

- Atopic eczema
- Drug-induced eruptions
- Urticaria
- Viral exanthems

Prognosis

PUPPP carries an excellent prognosis. Maternal health is generally unaffected apart from discomfort due to pruritus. Early delivery is rarely required and is reserved for exceptional cases of intractable itching.

There are no associated fetal complications, and neonatal skin involvement is uncommon. The condition usually resolves within four to six weeks, and recurrence in subsequent pregnancies is rare, except in cases of multiple gestations.

Conclusion

Pruritic urticarial papules and plaques of pregnancy is a benign, self- limiting dermatosis with a favorable outcome. Although the condition can cause significant discomfort, it does not pose an increased risk to the mother or fetus. Effective management requires patient reassurance, symptomatic treatment, and collaboration among dermatologists, obstetricians, nursing staff, and pediatricians, particularly in severe cases.

References

1. Cleveland Clinic.PUPPP Ras: Symptoms, Causes, Treatment & Prevention. Cleveland Clinic; 2025 May 28[cited 2026 Feb 8]. Available from: https://my.clevelandclinic.org/health/disease/22374-puppp-rash

2. StatPearls .Treasure Island (FL): StatPearls Publishing; 2024. Pruritic urticarial papules and plaques of pregnancy. Available from: https://www.ncbi.nlm.nih.gov/books/NBK539700

3. DermNet NZ. Polymorphic eruption of pregnancy. New Zealand: DermNet; 2023. Available from: https://dermnetnz.org/topics/polymorphic-eruption-of-pregnancy

4. Science Direct Topics. Pruritic urticarial papules and plaques of pregnancy .Elsevier; 2023. Available from: https://www.sciencedirect.com/topics/medicine-and-dentistry/pruritic-urticarial-papules-and-plaques-of-pregnancy

5. Ambros-Rudolph CM. Polymorphic eruption of pregnancy. Clin Dermatol. 2016;34(3):384–91. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC5437438/

6. Bioline International. Pruritic urticarial papules and plaques of pregnancy. Available from:

https://www.bioline.org.br/pdf?rw20001

7. International Journal of Research in Dermatology. Pruritic urticarial papules and plaques of pregnancy. 2020.

Available from: https://www.ijord.com/index.php/ijord/article/view/1275