

Case presentation

Bullous impetigo and pregnancy: Case report and review of blistering conditions in pregnancy

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Abstract

Background: Bullous impetigo results from *Staphylococcus aureus* (*S. aureus*) release of exfoliative toxins type A and type B that results in flaccid, easily ruptured, bullae in the upper layers of the epidermis. Physiologic, gestation-associated, and incidental skin changes can occur in pregnancy. Blisters in pregnant women can occur secondary to either common skin disorders or specific dermatoses of pregnancy.

Purpose: To describe a pregnant woman with bullous impetigo and review bullous conditions in pregnant women.

Methods: PubMed was used to search the following terms, separately and in combination: blister, blistering, bullous, gestationis, herpes, herpetiformis, impetigo, pemphigoid, pregnancy, pregnant, psoriasis, pustular, virus. All papers were reviewed and relevant manuscripts, along with their reference citations, were evaluated.

Results: Flaccid, easily rupturing, pustules, which developed into superficial annular erosions with peripheral scale and central healing appeared in a woman of 7-weeks gestation and allergy to penicillin on her lower abdomen, suprapubic region, perineum, buttocks, and proximal legs. A bacterial culture subsequently isolated methicillin-susceptible *S. aureus*. All of the lesions resolved after treatment with clindamycin.

Conclusions: Bullous impetigo should be considered in the differential diagnosis of common skin diseases presenting as blisters in pregnant women.

Keywords: blister, blistering, bullous, gestationis, herpes, herpetiformis, impetigo, pemphigoid, pregnancy, pregnant, psoriasis, pustular, virus

Introduction

Bullous impetigo is typically caused by *Staphylococcus aureus* (*S. aureus*). Pregnancy can be associated with gestation-associated dermatoses, including some that present with bullous lesions. A woman who is 7 weeks pregnant with bullous impetigo is described and blistering conditions--both gestation-related and idiopathic--in pregnant women are reviewed.

Case synopsis

An 18-year-old afebrile woman presented to the emergency center for evaluation of itchy and tender skin lesions that were predominantly located on her lower abdomen, groin, and proximal legs. She was 7 weeks pregnant; she had no prior pregnancies. She was also allergic to penicillin and had no history of atopic dermatitis or sexually transmitted diseases, including herpes simplex virus infection.

She had developed pruritic red papules in her pubic region, 5 weeks earlier, after shaving the area. Tender blisters, containing yellow fluid, appeared 2 days later. They were fragile and easily ruptured. New pustules, that would also subsequently rupture, continued to develop.

Cutaneous examination showed shallow annular erosions with peripheral scaling and central healing on the lower abdomen, suprapubic region, perineum, buttocks, and proximal lower extremities (Figure 1). Some of the lesions had central crusts or erythematous borders or both. A 2 mm pustule was also present on the right breast.



Figure 1 (a, b, and c). Bullous impetigo appearing as annular erosions with erythematous peripheral scaling and central healing on the right lower abdomen (a), suprapubic region (b), and proximal right thigh (c).

The diagnosis of bullous impetigo was considered based upon correlation of the clinical history and the lesion morphology. A bacterial culture from a suprapubic lesion was performed and she was empirically treated orally with 300 mg of clindamycin 4 times daily. Methicillin sensitive *S. aureus*, susceptible to clindamycin, was subsequently isolated from the lesion. Normal or negative laboratory studies included complete blood cell and platelet count, serum chemistries, urinalysis, syphilis EIA screen, HIV antibody, and viral culture.

All of the skin lesions resolved during the 10 days of antibiotic treatment.

Discussion

Bullous impetigo usually presents as easily ruptured, flaccid, transparent bullae. Lesions are frequently found on the buttocks, extremities, face, perineum and trunk. Similar to the described patient, the ruptured bullae can appear as shallow moist erosions with a narrow rim of scale at the edge. Exfoliative toxins, type A and type B, released by the staphylococcus are trypsin-like serine proteases that bind and cleave desmoglein 1; this results in blister formation in the upper epidermis of skin lesions in patients with bullous impetigo and its generalized variant staphylococcal scalded skin syndrome [1-5].

Skin changes in pregnancy can be physiologic, gestation-associated, or incidental (Table 1) [6-12]. Physiological changes commonly observed in pregnancy include hyperpigmentation, palmar erythema, and striae distensae [6,7]. In addition, there is an immunologic change of T helper lymphocytes from type 1 cells to type 2 cells [6].

Table 1. Skin changes in pregnancy

Physiologic cutaneous changes in pregnancy

Adnexal changes (increased eccrine and sebaceous gland function and decreased apocrine gland function)
Hyperpigmentation (linea nigra, melasma, vulvar melanosis)
Nail changes (Beau's lines, brittle nails, distal onycholysis, subungual hyperkeratosis)
Prurigo of pregnancy (also referred to as pruritus gravidum) [a]
Striae distensae
Telogen effluvium (post partum)

Specific dermatoses of pregnancy

Atopic eczema of pregnancy
Atopic eruption of pregnancy [b]
Impetigo herpetiformis (also referred to as pustular psoriasis of pregnancy)
Intrahepatic cholestasis of pregnancy
Pemphigoid gestationis (also referred to as herpes gestationis)
Polymorphic eruption of pregnancy (also referred to as pruritic urticarial papules and plaques of pregnancy)
Prurigo of pregnancy (also referred to as pruritus gravidum) [a]
Pruritic folliculitis of pregnancy

Skin disease that can initially occur or flare in pregnancy

Acne
Acute febrile neutrophilic dermatosis (Sweet's syndrome)
Autoimmune conditions (lupus erythematosus and pemphigus)
Erythema nodosum
Infections (herpes virus)
Infestations (scabies)
Pityriasis rosea
Psoriasis
Rosacea
Urticaria

[a] Pruritus of pregnancy (also referred to as pruritus gravidum) has been classified as both a physiologic and specific skin manifestation of gestation. It also now includes previously described conditions: Besnier's prurigo gestationis, Nurse's early prurigo of pregnancy, and papular dermatosis of Spangler. Recently, it has been proposed for it to be reclassified as a subset of atopic eruption of pregnancy.

[b] It has been suggested that this terminology be used to include the following conditions: atopic eczema of pregnancy, prurigo of pregnancy, and pruritic folliculitis of pregnancy.

Specific dermatoses of pregnancy include atopic eruption of pregnancy, impetigo herpetiformis, intrahepatic cholestasis of pregnancy, pemphigoid gestationis, polymorphic eruption of pregnancy, and prurigo of pregnancy (Table 1) [6-11]. Acute febrile neutrophilic dermatosis (Sweet syndrome) and erythema nodosum are other conditions that occur not only in an idiopathic setting or as a malignancy-associated disease, but also can be related to drug exposure or pregnancy [6,13,14]. Whereas acute febrile

neutrophilic dermatosis typically manifests with pseudovesicular lesions [15], folliculitis of pregnancy variant of atopic eruption of pregnancy and impetigo herpetiformis present with pustules and pemphigoid gestationis presents with vesicles [9,10].

There are several common skin diseases that initially occur or flare in pregnant women (Table 1) [6-12]. Ambros-Rudolph et al, in a study of 505 pregnant patients, identified 11 women with contact dermatitis and 10 women with cutaneous infections; 8 had a viral infection and 2 had a bacterial infection—however, the specific infectious pathogens were not described [9]. Hassan et al's study of 650 pregnant females noted contact dermatitis in 2 women and herpes simplex infection in 1 woman [11].

A recent review of skin disease in pregnancy mentions the existence of secondary bacterial infections in pregnant women, but does not address the specific pathogens or incidence [6]. Similarly, larger studies evaluating pregnant women either did not observed any [11], or only noted 0.4% (2 of 505) of [9], women with a bacterial infection. The paucity of reports of bacterial infection in pregnant women is unexpected and may not accurately represent the occurrence of these infections in this patient population. Indeed, it is possible that bullous impetigo is not frequently described in pregnancy because it is a common condition [16].

Skin conditions characterized by blisters in pregnancy can be either gestation-related or incidental (Table 2) [6-12,17]. Specific dermatoses of pregnancy include impetigo herpetiformis and pemphigoid gestationis—presenting with either pustules or vesicles, respectively—usually appear in the second or third trimester of pregnancy [6-11]. Also, a 19-year-old primagravida with biopsy-confirmed pruritic folliculitis of pregnancy presented at 11 weeks gestation with follicular erythematous papules with several pustules on her trunk and proximal limbs [9]. The early onset (first trimester) of non-pruritic pustules, that were not limited to her hair follicles, in the reported patient prompted consideration of her more common condition (bullous impetigo) in contrast to a pregnancy-associated dermatosis that typically presents later in gestation (impetigo herpetiformis or pemphigoid gestationis) or is follicular and pruritic (pruritic folliculitis of pregnancy).

Table 2. Skin conditions characterized by blisters in pregnancy

Pustules

Common skin diseases

Bullous impetigo [a]

Impetiginized herpes simplex virus infection

Specific dermatoses of pregnancy

Impetigo herpetiformis

Pruritic folliculitis of pregnancy

Vesicles

Common skin diseases

Contact dermatitis

Herpes virus infections

Pemphigus

Specific dermatoses of pregnancy

Pemphigoid gestationis

[a] Staphylococcal scalded skin syndrome, a generalized variant of bullous impetigo, has also, albeit rarely, been described in pregnancy. A 21-year-old gravida 3, para 2, aborta 0 pregnant woman with a history of chronic atopic dermatitis was hospitalized at 24 weeks gestation. Her atopic dermatitis had worsened and she had mild generalized facial swelling and desquamation, substantial periorbital edema, and purulent discharge from both eyes (which subsequently grew methicillin-resistant *Staphylococcus aureus*). In addition, she had diffuse desquamation of her skin and lichenified plaques on her arms, legs and trunk. A treatment course of intravenous vancomycin was given and she had a full recovery. A healthy newborn—without infection or blistering at birth or during the hospital stay—was delivered by cesarian delivery at 36 weeks and 6 days gestation [17].

Common skin diseases that can present with bullous lesions include contact dermatitis to a new or established allergen can present with pruritic vesicles [9,11]. In addition, primary autoimmune bullous dermatoses, such as pemphigus vulgaris or pemphigus foliaceus, can develop or worsen during pregnancy [6,7]. Also, primary herpes simplex infection has been observed in approximately 2% of pregnancies [6]; incidental recurrence of the infection is characterized by the discovery of similar appearing vesicles at the site of prior lesions.

Bullous lesions of coexisting viral (herpes simplex) and bacterial (*S. aureus*) infection were described in a 22-year-old pregnant woman who presented at 23 weeks of gestation with not only disseminated herpes simplex virus skin infection (impetiginized

eczema herpeticum) but also concurrent methicillin sensitive *S. aureus* sepsis. She had a history of atopic dermatitis and developed vesiculo-papular lesions, several containing pus, on her face, neck, and upper torso. She was successfully treated with intravenous acyclovir and cefazolin. Subsequently, herpes simplex virus type 1 was cultured from the skin lesions and methicillin sensitive *S. aureus* was isolated from both skin and blood cultures [12].

The currently reported patient had both intact and ruptured pustules from which methicillin sensitive *S. aureus* was cultured. She was allergic to penicillin and was therefore treated with clindamycin. All of her skin lesions completely resolved with oral antibiotic treatment.

Conclusion

Bullous impetigo results from a trypsin-like serine protease that causes flaccid bullae in the upper epidermis by binding and cleaving desmoglein 1. Pregnancy-associated skin changes can be physiologic, gestation-related, or incidental. Pustules and vesicles in pregnant women have been observed with either common skin diseases or specific dermatoses of pregnancy. Although *S. aureus*-induced impetigo is a common contagious skin infection, bullous infection caused by this bacteria in pregnant women is not frequently described. However, clinicians should always initially consider common conditions in a pregnant woman and not assume that the diagnosis is a pregnancy-associated disease just because the patient is pregnant. In summary, bullous impetigo should be considered in the differential diagnosis of intact or ruptured blisters in a woman who is pregnant.

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