Review Article

Pregnancy related skin changes and skin diseases

Hassan T[1], Mohsena M[2], Sultana A[3], Khondoker L[4], Islam S[5], Sultana R[6]

Abstract

The skin and related structures undergo changes during pregnancy and peurperium. They can be separated into three categories - hormone related pregnancy specific and preexisting. The physiologic changes are mainly of cosmetic importance. The pregnancy specific skin diseases have associated symptoms. Most skin conditions resolve post partum and only require symptomatic treatment. Some of them are associated with an increase in both fetal and/or maternal morbidity and mortality.

Key words : Pregnancy, skin changes, peurperium

Introduction

Pregnancy is a state of profound hormonal, immunologic and metabolic changes. These changes contribute to the spectrum of physiologic changes seen in pregnancy.1 Normal hormonal changes during pregnancy may cause benign skin conditions which include pigmentary, vascular, structural and appendageal changes. Pregnancy specific skin conditions include pemphigoid gestationis, cholestasis of pregnancy, impetigo herpetiformis, pruritic urticarial papules and plaques of pregnancy, prurigo of pregnancy and pruritic folliculitis. skin conditions like atopic dermatitis, psoriasis, fungal infection and cutaneous tumours may change during pregnancy. Antepartum surveillance is recommended for patients with intrahepatic cholestasis of pregnancy, impetigo herpetiformis and pemphigoid gestationis.

1. Dr Tahmida Hassan, Associate Professor
Department of Dermatolology and Venereology
Sir Salimullah Medical College, Dhaka
2. Dr Masuda Mohsena, Associate Professor
Department of Community Medicine
Ibrahim Medical College, Dhaka
3. Dr Abida Sultana, Associate Professor
Department of Dermatology and Venereology
BSMMU, Dhaka
4. *Dr Lubna Khondoker, Assistant Professor
Department of Dermatology and Venereology
BSMMU, Dhaka. E-mail: lubnaderma@gmail.com
5. Dr Shiropa Islam, Junior Consultant
Upozilla health complex, Ghatail, Tangail
6. Dr Razia Sultana
Child Development Centre
Chittagong Medical College Hospital, Chittagong

**For correspondence*

Physiologic cutaneous changes in pregnancy

Pigmentary changes : Hyperpigmentation occurs in 90% of women during pregnancy. This usually occurs in localized areas and may be due to regional differences in melanocyte density within the epidermis. Occasionally generalized hyperpigmentation occurs.[2,3] The increase in melanocyte stimulating hormone, estrogen and progesterone are believed to play a role in these changes. The areas like the areola, nipples, genital skin, armpits and inner thighs tend to get darker. Sometimes a dark line called linea nigra, forms on the abdomen. Melasma occurs in 50% to 70% of pregnant woman. Treatment consists of sunscreen, hydroquinone and tretinoin.[4] Additional nevi and ephelides may arise de novo, increase in size or darken during pregnancy. Scars also darken.[5]

Structural Changes : Striae gravidarum or stretch marks occur in upto 90% of pregnant women by the third trimester.[6,7] They are more common in younger women, women with larger babies and woman with high body mass indices.[8] Non-whites and woman with a history of breast or thigh striae or a family history of striae gravidarum also are at higher risk.[9] They occur commonly on the abdomen of pregnant woman as the connective tissues beneath the skin tear as it stretches to accommodate the rapidly growing fetus. They appear as atrophic, wrinkled, erythematous, purplish bands that fade over time. The breasts, buttocks and thighs are other sites of involvement. Pathogenesis of striae formation is unclear. Proposed hypothesis include lateral stress in connective tissue and increased glucocorticiod levels due to elevated adrenocortical activity. Treatment options such as dietary supplements, topical low dose tretinoin or laser therapy with flashlamp–pumped pulsed dye laser post-pregnancy are of limited benefit.

Molluscum fibrosum gravidarum are benign, pedunculated, tan to brown, fleshy papules similr to acrochordons that are commonly seen on the neck, axilla, inner thighs and inframammary folds. They frequently occur during the second half of pregnancy and regress post partum. Treatment options include shave excision, electrocautery and scissors removal.

Vascular changes : Vascular changes in pregnancy are greatly influenced by changes in maternal hormones such as human chorionic gonadotrophin, adrenocorticotrophic hormone like substance, thyrotrophin releasing hormone and estrogen. These hormones result in an increase in cardiac output, vascular proliferation ,congestion and vasomotor instability.[11]

Spider nevi or angiomas occur in about two thirds of light complexioned and 10% of the dark complexioned pregnant women on the face, neck and arms commonly during the first and second trimesters.[12] Most spider nevi regress post partum but a small percentage persist and require treatment with elrctrocautery or laser.

Palmer erythema is a mottled erythema of the thenar and hypothenar eminences. It occurs in about two-thirds of light-complected and up to one third of dark complected pregnant woman. This condition is also seen in cirrhosis, hyperthyroidism and lupus indicating a possible role of increased estrogen levels as a common cause.[12]

Varicosities are ncreased distension in the superficial venous vasculature of legs (varicose veins), vagina, vestibule (jaccquemier-chadwick sign) and rectum (haemirrhoids) are common in pregnancy. Varicose veins usually regress post partum but in severe cases surgical intervention may be necessary.[10-12]

Vascular changes coupled with increased blood volume can cause increased leakage which leads to non pitting edema of the face, eyelids and extremities upto one half of pregnant woman. Vasomotor instability also cause facial flushing, dermographism, hot and cold sensation and marble skin,a condition characterized by bluish skin discoloration from an exaggerated response to cold Spider-like telangiectasias require sclerotherapy or laser therapy. Haemorrhoids are treated with stool softeners & topical anti-inflammatory agents. In severe cases, injection of sclerosing agents or rubber band ligation may be required.

All pregnant woman experience some gingival hyperemia and edema, which may be associated with gingivitis and bleeding especially in the third trimester. Pyogenic granulomas can appear late in the first trimester or in the second trimester as deep red or purple nodules on the gingival, or less commonly on other skin surfaces. These lesions typically regress post partum.

Granuloma gravidarum is a benign, rapidly proliferating vascular lesion that commonly occurs at previous sites of trauma on the face, neck and digits. Although postpartum regression is common, surgical removal followed by electrodessication may be required.[13]

Appendageal changes : Activity of eccrine glands along with increased thyroid activity results in hyperhidrosis and miliaria. Pregnacy results in decrease in activity of apocrine gland and improvement of conditions such as hidradenitis suppurativa. Sebaceous gland demonstrate increased activity during pregnancy resulting in new onset or exacerbation of preexisting acne. However a minority of cases show improvement of cases during pregnancy.

Hair and nail changes : Pregnancy is associated with a decrease in the percentage of hair follicle in telogen phase.[14] Many womaen notice increased thickness of body and scalp hair. Hirsutism, with increased hair growth on the face, limbs and back, may also be seen. Post partum scalp hair enters a prolonged resting phase of hair growth causing increased shedding which may last for several months or more than one year after pregnancy.[15] Nails usually grow faster during pregnancy. Nail changes such as onycholysis, transverse grooving, brittleness and subungual keratosis have been reported. The cause of these uncommon findings is unclear. Most of these conditions resolve post partum.[15]

Preexisting skin conditions

Preexisting skin conditions such as atopic dermatitis, psoriasis, candidal and other fungal infections, skin tumors including molluscum fibrosum gravidarum and malignant melanoma may change during pregnancy. Atopic changes usually worsen but may improve during pregnancy.[16] Psoriasis is more likely to improve than worsen. Fungal infections generally require a longer treatment course.[17] Skin tags can occur on the face, neck, upper chest and beneath the breasts during pregnancy. Pregnant woman with melanoma showed no evidence that pregnancy affects survival.[18] Immunologic changes during pregnancy result in exacerbation of previous lesions of human papilloma virus. Recognition of HPV infection is important because certain strains can be transmitted to the fetus through an infected birth canal. Treatments for HPV are not curative and latent infection persists.[19] Herpes simplex infection at the time of delivery is associated with a high risk of neonatal infection. If there is evidence of active infection or viral shedding, cesarean delivery should be performed.[20]

Pregnancy specific dermatologic disorder

Pemphigoid gestationis : This disease is an autoimmune skin disorder with an incidence of approximately 1 in 50,000 pregnacies in mid to late pregnacies.[21] In 20% cases the eruption appears immediately post partum.[22]

Clinical presentation is an abrupt onset of an intensely priritic urticarial eruption on the trunk that forms tense vesicobullous lesions. Mucosal surfaces are involved in less than 20% cases. The lesions tend to spare face, palms and soles. In 75% cases, it flares around the time of delivery, regressing spontaneously after the baby is born.[23] The disease is common in subsequent pregnancy. Direct immunofluorescence microscopy of a sample of perilesional skin can show tissue bound immunoreactants. Linear deposition of complement protein C3 along the basement membrane zone is diagnostic for Pemphigoid gestationis. IgG is also deposited about 40% of the time. Mild placental failure has been associated with premature delivery and newborns who are small for gestational age. Therefore antenatal surveillance should be considered.[24] Treatment options include oral steroids (0.5mg/kg daily) with a possible increase in dose around the time of delivery to avoid post partum exacerbations. Other options include plasmapheresis, topical corticosteroids and antihistamines, all of which offer little benefit. After delivery, depending on the breast feeding status, alternative treatments include dapsone, methotrexate and cyclosporine.[25]

Impetigo Herpetiformis : It is a form of pustular psoriasis which is a rare disorder and appears in the second half of pregnancy. It appears in pregnancy without any personal or family history of psoriasis and usually ceases when the pregnancy is concluded. The disease begins as erythematous plaques with pustules on the inner thighs, flexural areas and groin. The lesions spread to the trunk and extremities. As the plaques enlarge, the centre becomes eroded and crusted. The hands, feet and face are usually spared. Oral and esophageal erosion can occur. Pruritus is mild but lesions are painful and flu-like symptoms are often present.[26] Medical complications like secondary infection, septicemia hypoalbuminemia may occur. Recurrent eruptions in subsequent pregnancies usually present with an earlier onset and more severe course.[27] Increased fetal morbidity has been reported, suggesting the need for increased antenatal surveillance. Treatment involves oral corticosteroids, correction of hypocalcemia, supportive measures and antibiotics to prevent secondary infections. Termination of pregnancy is usually curative.[28] Retinoids and light therapy are more effective means of treatment that can be used post partum.

Cholestasis of pregnancy : Cholestasis of pregnancy was initially described by Svanborg[29] and Thorling.[30] The etiology is believed to be multifactorial and the condition occurs in .02% to 2.4% of pregnancies. There is also seasonal variation in the prevalence of this condition, with a higher incidence in the winter months.Fifty percent of cases are believed to be familial and a higher association has been seen in twin pregnancies.[31,32] In 80% of patients,the time of onset is after the 30th week.[33] Clinical presentation includes severe generalized pruritus with no primary skin lesions with or without jaundice. Secondary excoriations due to patient's scratching may be the only skin findings. The extent and severity of pruritus fluctuates until the time of delivery.[34] Most severe pruritus occurs at night.[35] Laboratory skin markers include elevated serum bile acids levels and alkaline phophatase levels with or without elevated serum bilirubin levels.[36] The intrahepatic cholestasis of pregnancy may cause vitamin K deficiency and coagulopathy. The condition usually resolves post partum. The condition tends to recur in subsequent pregnancies. Patients may have a family history of cholelithiasis and a higher risk of gallstones.[37] The condition is associated with a higher risk of premature delivery, meconium stained amniotic fluid,and intrauterine demise. So patients should receive increased antenatal surveillance at the time of diagnosis and some authorities recommend delivey by 38 weeks' gestation. The impact of early delivery on perinatal complication is not completely clear.[38] Treatment options range from bed rest, a low fat diet and topical emollients in mild cases to the use of agents such as cholestyramine and ursodeoxycholic acid in more severe cases. In severe cases, fetal monitoring and cesarian section may be required.

Pruritic urticarial papules and plaques of pregnancy (PUPPP) : It is a pruritic inflammatory skin disorder with an incidence of 1 in 160. It is the most common of the dermatoses unique to pregnancy. 75% to 85% cases occur in primi gravidas who experience an abrupt onset in the third trimester or immediately postpartum.[39] The etiology of PUPPP remains unclear. A relatiotionship between the condition and maternal immune system & fetal cells has been proposed.[40] One proposed theory is the rapid stretching of the skin late in pregnancy. This is supported by the initial presentation of the eruption along the striae ditensae. Increased maternal and new born weight gain lends support to this theory. There is a higher incidence of PUPPP in twin pregnancies.[41,42,43] The eruption begins on the abdomen along striae distensi sparing the umbilical and peri umbilical area. They may spread to the thighs, buttocks and extremities but facial involvement is rare. The lesions include vesicular, target-like, annular, polycyclic papules or plaques that become confluent over time. Direct immunfluorescence is negative for a linear band of C3 or IgG along the skin demoepidermal junction. It is a self limiting disease with a mean duration of 6weeks. Treatment is symptomatic relief

of pruritus with topical corticosteroids of low to mid potency and pregnancy category B antihistamines such as loratidine and cetirizine.In severe cases systemic corticosteroids or induced delivery is considered.

Prurigo of Pregnancy : Prurigo of pregnancy was initially described by Besiner in 1904[44] as prurigo gestationis. Incidence is 1 in 300 pregnancies. It commonly occurs in second to third trimester of pregnancy as discrete erythematous papules with excoriations. The lesions typically present on the extensor surfaces of arms and legs or on the abdomen. Dermatopathology of skin biopsy shows parakeratosis and mild acanthosis with a mixed inflammatory infiltrate of neutrophils and eosinophils in the perivascular area. DIF results and laboratory values are normal. Many patients have history of atopy.[45] There is no increased fetal or maternal risk. Treatment is symptomatic relief with topical corticosteroids and antihistamines.[46]

Papular Dermatitis of Pregnancy : Papular dermatitis of pregnancy was initially described by Spangler in 1962[47] as a generalized papular erythematous and pruritic eruption with central crust. The distribution is on the abdomen with spread to the extremities. Histopathology and DIF finding are similar to prurigo of pregnancy. The high fetal risk initially reported by Spangler has not been reproducible in other studies.[48]

Pruritic Folliculitis of Pregnancy : Pruritc folliculitis of pregnancy was first described by Zoberman and Farmer in 1981.[49] The etiology of pruritic folliculitis of pregnancy is uncertain and there is no report of adverse fetal outcome clearly related to the condition. Onset of eruption commonly occurs in the second or third trimester of pregnancy as small erythematous papules around follicles. The lesions begin on the abdomen and spread to the extremities.[50,51] Histopathology resembles a folliculitis and the DIF is negative. Differential diagnosis involves papular dermatitis or steroid induced acne. The fetus is unaffected and spontaneous resolution occurs after delivery. Treatment options are low to mid potency topical steroid or topical benzoyl peroxide.

References

1. Elling SV, Powell FC. Physiological changes in the skin during pregnancy. Clin Dermatol. 1997; 15 : 35 - 43.
2. Martin AG, Leal-Khouri S. Physiologic skin changes associated with pregnancy. Int J Dermatol. 1992; 31:375.
3. Kumar R, Jaisankar TJ, Thappa DM. A clinical study of skin changes in pregnancy. Indian J Dermatol Venereol Leprol. 2007;73:141.
4. Winton GB, Lewis CW. Dermatoses of Pregnancy. J Am Acad Dermatol. 1982; 6 : 977-998.
5. Lawly TJ, Yancy KB. Skin changes and diseases in pregnancy. In : Freedberg IM, Eisen AZ, Wolff K, editors. Fitzpatrick's Dermatology in General Medicine. 5th ed. New York : McGraw-Hill; 1999. pp. 1963-1969.
6. Kroumpouzos G, Cohen LM. Dermatoses of preganacy. J Am Acad Dermatol. 2001;45:1-19.
7. Wong RC, Ellis CN. Physiologic skin canges during pregnancy. J Am Acad Dermatol. 1984 ; 10 : 929-40.
8. Thomas RG, Liston WA. Clinical association of striae gravidarum J Obstet Gynaecol. 2004 ; 24 : 270-1.
9. Chang AL, Agredano YZ, Kimball AB. Risk factors associated with striae gravidarum. J Am Acad Dermatol. 2004; 51: 881-5.
10. Hellreich PD. The skin changes of pregnancy. Cutis.1974; 13 :82-86.
11. Brenner S, Politi Y. Dermatologic diseases and problems of women throught the life cycle. Int J Dermatol. 1995; 34 : 369-379.
12. Martin AG, Leal-Khouri S. Physiologic skin changes associated with pregnancy. Int J Dermatol. 1992;31:375-8.
13. Graham-Brown RAC. The ages of man and their dermatoses. In : Rook A, Wilkinson DS, Ebling FGB, editors. Textbook of Dermatology. London : Blackwell Scientific Publications; 1998. pp 3259-77.
14. Lynfield YL. Effect of pregnancy on the human hair cycle. J Invest Dermatol. 1960; 35 :323-7.
15. Headington JT. Telogen Effluvium. New concepts and review. Arch Dermatol. 1993 ;129:356-63.
16. Kemmet D, Tidman MJ. The influence of the menstrual cycle and pregnancy on atopic dermatitis. Br J Dermatol. 1991;125:59-61.
17. Young GL, Jewell D. Topical treatment for vaginal candidiasis in pregnancy. Cochrane Database Syst Rev. 2001;(4)CD000225.
18. Lens MB, Rosdahl I, Ahlbom A, Farahmand BY, Synnerstad I, Boeryd B et al. Effect of pregnancy on survival in woman with with cutaneous malignant melanoma. J Clin Oncol. 2004;22:4369-75.
19. Greenberg MD, Rutledge LH. Understanding human papillomaviral infections in woman. Semin Dermatol. 1992; 11: 241-6.

20. Freij BJ, Sever JL. Infectious complications of pregnancy. Clin Perinatol. 1988; 15 : 202-213.
21. Shomick JK, BangertJL, FreemanRG, Gillman JN. Herpes Gestationis. Clinical and histologic feature of twenty eight cases. J Am Acad Dermatol. 1983; 8: 214-24.
22. Kroumpouzos G,Cohen LM. Specific dermatoses of pregnancy.An evidence based systemic review.Am J Obstet Gynecol. 2003 ; 188 :1083-92.
23. Shomick JD. Dermatoses of pregnancy. Semin Cutan Med Surg.1998 ; 17:172-81.
24. Stambuk R, Colven R. Dermatologic disorders. In : Gabbe SG, Niebyl JR, editors. Obstretics: Normal and Problem Pregnacies 4th ed. New York :Churchill Living stone; 2002. pp.1283-92.
25. Slanzinski, Degefu S. Herpes gestationis associated with coriocarcinoma. Arch Dermatol. 1982; 118 : 425 - 428.
26. Oumeish OY, Panish JL. Impetigo herpetiformis. Clin in Dermatol. 2006;24:101-104.
27. Lotem M, Katzennelson V, Rotem A. Impetigo herpetiformis : A variant of pustular psoriasis or a separate entity ? J Am Acad Dermatol. 1989; 20 : 338-41, .
28. Oumeish OY, Ferraj SE, Bataineh AS. Some aspects of impetigo herpetiformis. Arch Dermatol. 1982; 118 : 103-105.
29. Svanborg A. Astudy of recurrent jaundice in pregnancy. Acta Obset Gynecol Scand. 1954 ; 33 : 434 - 44.
30. Thorling L : Jaundice in pregnancy : Aclinical study. Acta Med Scand 151(suppl) : 1-123,1995.
31. Reyes H. The spectrum of liver and gastrointestinal disease seen in cholestasis of pregnacy. Gastro enterol Clin North Am. 1992; 21 : 905-21.
32. Gonzalez MC, Reyes H, Arrese M. Intrahepatic cholestasis of pregnancy in twin pregnancies. J Hepatol. 1989; 9 : 84-90.
33. Genees V, Williamson C. Intrahepatic cholestasis of pregnancy. World J Gastroenterol. 2009;15:2049-66.
34. Rayes H. Review : Intrahepatic cholestasis. Apuzzling disorder of pregnancy. J Gastroenterol Hepatol. 1997; 12: 211-216.
35. Murray JC : Pregnancy and the skin. Dermatol Clin. 1990; 8 : 327-34.
36. Glaptz A, Marschall HU, Mattsson LA. Intrahepatic cholestasis of pregnancy : relationship between bile acid levels and fetal complication rates. Hepatplogy. 2004 ; 40 : 467-74.
37. Khaaja RJ, Greer IA. Manifestation of chronic disease in pregnancy. JAMA. 2005 ; 294 : 2751-7.
38. Kenyon AP, Piercy CN,Girling J, William C. Tribe RM, Shennan AH. Obstretic cholestasis - outcome of active management : a series of 70 cases. BJOG. 2002 ;109 :282-8.
39. Holmes RC. Polymorphic eruption of pregnancy. Semin Dermatol. 1989; 8 : 18-22.
40. Arctingi S, berkane N, Bertheau P, Le Goue C, DausSet J, Uzan S et al. Fetal DNA in skin of polymorphic eruptions of pregnancy. Lancet.1998; 352 : 1898-901.
41. Yancy KB, Hall RP, Lawley TJ : Pruritic urticarial papules and plaques of pregnancy. J Am Acad Dermatol. 1984. 10 :473 - 80.
42. Cohen LM, Capeless EL, Krusinski PA, Maloney ME : Pruritic urticarial papules and plaques of pregnancy and its relationship to maternal-fetal weight gain and twin pregnancy. Arch Dermatol. 1989; 125 :1534-6.
43. Beckett MA, Goldberg NS : Pruritic urticarial plaques and papules of pregnancy and skin distension. Arch Dermatol. 1991; 127 : 125 - 6.
44. Besnier E, Brocq L, Jacquet L. La Pra ique Dermatologique. Paris:Masson et Cie ;1904. pp. 75.
45. Rudolph CM, Al- Fares S, Vaughan-Jones SA. Polymorphic eruption of pregnancy: clinicopathology and potential trigger factors in 161 patients. Clin Lab Invest. 2006 ;154 : 54-60.
46. Shornick JK. Dermatoses of pregnancy. Semin Cutan Med Surg. 1998; 17:172-181.
47. Spangler AS, Reddy W, Bardawil WA. Papular dermatitis of pregnancy.JAMA. 1962; 181 : 577-81.
48. Michaud RM, Jacobson D, Dahi MV. Papular dermatitis of pregnancy. Arch Dermatol. 1982; 118 : 1003-5.
49. Zoberman E, Farmer ER : Pruritic folliculitis of pregnancy. Arch Dermatol. 1981; 117 : 20-22.
50. Vaughan-Jones SA, HemS, Nelson-Piercy C. A prospective study of 200 women with dermatoses of pregnancy correlating clinical findings with hormonal and immunopathological profiles. Br J Dermatol.1999;141:71-81.
51. Kroumpouzos G, Cohen LM.Pruritic folliculitis of pregnancy,J Am Acad Dermatol 2000;43:132-134.