Four Cases of Pigmentary Dermacation Lines of Pregnancy with Erythema

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Pigmentary dermarcation lines are boundaries between more deeply pigmented skin and areas of lighter pigmentation. We report 4 cases of pigmentary demarcation lines of pregnancy associated with erythema which developed in the third trimester of pregnancy and were symmetrically located in the buttock and posteromedial portion of the lower extremities. After delivery, the erythema disappeared within 3-7 days, followed by slow resolution of the brownish pigmentation. (Ann Dermatol 10:(1) 35~38, 1998).

Key Words : Erythema, Pigmentary dermacation lines, Pregnancy

Pigmentary demarcation lines(PDL) are borders of abrupt transition between deeply pigmented skin and areas of lighter pigmentation[1]. They are most commonly described among Japanese and black people and can be classifed into 5 groups according to their distinctive locations[2,3]. The lines consist of asymptomatic, brownish patches that are bilateral and symmetrical.

An association between PDL and pregnancy has been recognized and several authors have reported this phenomenon[2,4,5,6]. However, only two cases of PDL have been reported in Korea[6], none of which were associated with erythema.

We herein describe 4 patients who discovered pronounced PDL of pregnancy with erythema in the third trimester of pregnancy which eventually resolved after delivery.

CASE REPORTS

Case 1

A 25-year-old woman, Gravida 2, Para 0, at 32 weeks' gestation, visited our dermatology clinic complaining of asymptomatic erythematous lesions on the lower extremities that developed at 28 weeks' gestation. On physical examination, there were erythematous to brownish patches on the lower buttock and the posterior lower extremities extending from the thighs to the upper one-third of the calves. The same lesions appeared on the upper one-third of the anterior thighs and knees(Fig.1, 2A). The medial side of the lesions showed a lighter color which the patient claimed to be her normal skin color. The lesions were symmetrical and bilateral. The patient had a weight gain of 10 Kg during 32 weeks of pregnancy. She also noticed moderate numbness of the left lower extremity for one week. Her past history was insignificant except for a mercury allergy. Laboratory findings revealed a decrease in hemoglobin(7.2g/dl) and hematocrit(25.9%), but the eosinophil count, renal function test, liver function test and blood glucose level were within normal ranges. A healthy female baby was born at 41 weeks' gestation by normal spontaneous vaginal delivery(NSVD) and her birth weight was 3.15 Kg. A skin biopsy was performed from the lesion of the right posterior thigh two days after delivery. Light microscopic findings revealed superficial perivenular lymphocytic infiltration and a focal increase of basal melanin. The erythema disappeared three days after delivery and about seventy percent of the brownish pigmentation spontaneously resolved three months later.

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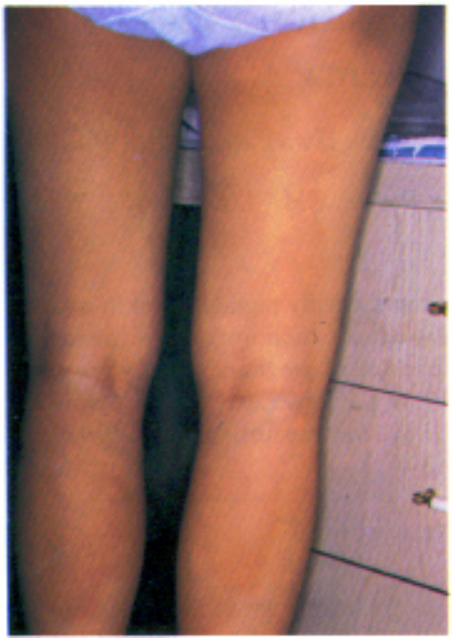

Fig. 1. Erythematous to brownish patches on the posterior aspect of the lower extremities extending from the lower buttock to the upper one-third of the calves(case 1).

Case 2

A 32-year-old woman, Gravida 1, Para 0, at 37 weeks' gestation, visited our dermatology department for evaluation of asymptomatic erythematous lesions on the lower extremities that developed at 34 weeks' gestation. On physical examination, there were erythematous patches extending from the lower buttock to the heels and also involving the anterior lower extremities from the inguinal region down to the anteromedial aspect of the thighs and knees(Fig.2B). Her weight gain was 15.2 Kg for 37 weeks of pregnancy. Laboratory findings revealed a decrease in hemogloblin(9.1g/dl) and hematocrit(30.7%), but her eosinophil count, ESR, liver function test were within normal limits. She delivered a healthy male baby at 39 weeks' gestation by NSVD whose birth weight was 3.37 Kg. The erythema disappeared seven days after delivery and the residual brown pigmentation spontaneously disappeared two months later.

Case 3

A 33-year-old woman, Gravida 2, Para 1, at 34

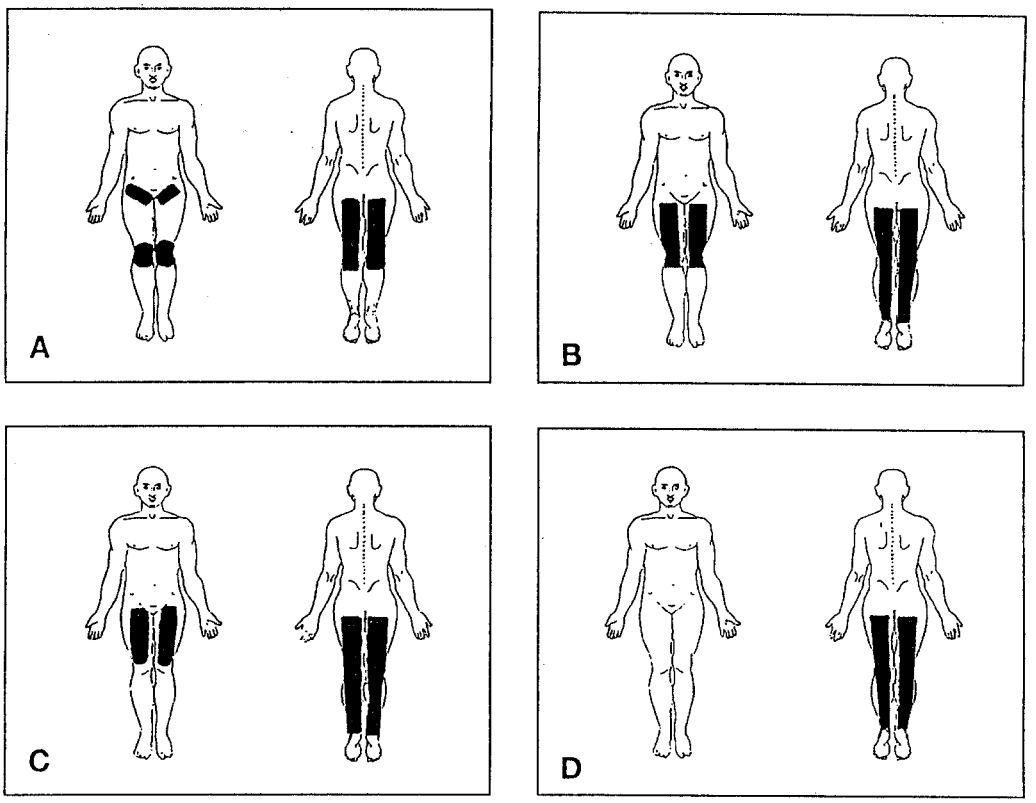

Fig. 2. Location of pigmentary demarcation lines of pregnancy associated with erythema in case 1(A), case 2(B), case 3(C), and case 4(D).

weeks' gestation, presented with asymptomatic erythematous lesions on the buttock and lower extremities that had developed two months previously. She had pain in the symphisis pubic area. She remembered having the same kind of lesions, limited to the anterior thighs, during the first pregnancy which spontaneously disappeared after delivery. She was a hepatitis B antigen carrier and conceived after a single intramuscular injection of progesterone. A physical examination revealed linear erythematous patches extending from the buttock to the calves and heels, and involvement of the anterior thighs(Fig.2C). Her body weight gain was 15 Kg for 34 weeks of pregnancy. Routine laboratory findings were within normal limits or negative except for a decrease in hemoglobin(11.4g/dl) and hematocrit(35.3%). She delivered a healthy male baby by NSVD whose birth weight was 3.29 Kg. The erythema lessened in one week and the lesions completely resolved after two months.

Case 4

A 32-year-old woman, Gravida 2, Para 0, at 35 weeks' gestation, presented with linear erythematous pigmentation on the posterior lower extremities of two weeks duration. She had conceived after a single intramascular injection of progesterone. On physical examination, she had linear erythematous patches on the posterior lower extremities which extended from the lower buttock to the heels and were sharply dermarcated from the normally pigmented medial aspect of the legs(Fig. 2D). Her body weight gain was 8.3 Kg for 35 weeks of pregnancy. Routine laboratory findings were within normal limits. She delivered a healthy male baby by NSVD whose birth weight was 3.32 Kg. The erythematous patches faded with residual brownish pigmentation one week after the delivery and this pigmentation disappeared almost completely without any specific treatment after three months.

DISCUSSION

Pigmentary demarcation lines(PDL) are boundaries of abrupt transition between more deeply pigmented skin and that of lighter pigmentation. Matzumoto first described PDL in 1913[1]. Miura classified them into four groups based on their specific locations[2] and later group E was added, as follows[3]:

Group A: Lateral aspect of upper anterior portion of arms, pectoral area
Group B: Posteromedial portion of the lower limb
Group C: Vertical line in pre- and parasternal are
Group D: Posteromedial area of spine
Group E: Bilateral aspect of chest(zone from midthird of clavicle to periareolar skin)

The most common types are group A and C, both of which occur in nearly one third of the patients screened[3]. The age of onset is in early childhood in most of the documented cases. In a population survey by James[7], seventy-nine percent of black female adults and seventy-five percent of black male patients were found to have at least one PDL. Fifteen percent of white female patients had one PDL and fourteen percent of black women noticed the appearance of new PDL with pregnancy. PDL has also been described in the Japanese population and Maruyama[8] reported group A lines to occcur in 39% of female patients and 23% of male patients although there have been some variations in this data in other Japanese reports.

A higher incidence of PDL have been noted in women which progressively increased with age[3]. The association of PDL with pregnancy may explain this higher incidence of PDL in older women where pregnancy is assumed to induce accentuation of preexisting lines or the appearance of new ones[3].

Group B PDL is the only type known to have an association with pregnancy. PDL associated with pregnancy have been reported and some cases are accompanied or preceded by an erythematous component[3,5]. All four cases described in this report belong to group B and developed in the third trimester of pregnancy. This finding is consistent with previous reports[3,4,5,6] in that PDL primarily manifests itself during the latter part of pregnancy. In contrast, our cases showed distinct differences in distribution of the lesions from the classic group B. Three of our four cases showed involvement of the anteromedial thighs and knees in addition to the posteromedial PDL. This pattern of distribution was also noticed by Hashimoto[5] who believed it might be an all new type of PDL. Unfortunately, there have been no following reports on such a distribution until now. All our cases were preceded by an erythematous component which disappeared

within 3-7 days after delivery, whereas the pigmentation subsided at a much slower rate.

The demarcation lines roughly corresponded to Voigt lines, which is known to follow the distribution of cutaneous nerves. They seem to have no relation to dermatomal lines or Blaschko's lines. The involved peripheral nerves in our cases seem to originate from S1-S2 and L2-L3 levels of the spinal cord. Ozawa[4] theoretically hypothesized that the enlarged uterus of late pregnancy compressed these nerves resulting in changes in the innervated cutaneous microvasculature. This could induce neurogenic inflammation which would eventually lead to erythema and pigmentation. The disappearance of both the erythema and pigmentation soon after delivery supports this hypothesis but the fact that there were no associated symptoms significantly undermines the reliability of this theory.

A variety of alterations in skin pigmentation are quite frequently encountered in pregnancy such as linea nigra, freckles, melasma, and hyperpigmentation of the genitalia, areolae, and nipples. Most of these changes disappear after delivery. Altered hormone levels are suspected to play a role in these well documented pigmentary changes of pregnancy. As PDL shows similarities in the natural course with these entities, elevated levels of melanocyte stimulating hormone, progesterone, and estrogen are believed to be involved in the pathogenesis of PDL[6]. Other unsubstantiated but certainly possible factors include genetic predisposition, advancing age, and various diseases, especially pulmonary tuberculosis[5]. However, none of our cases showed any correlation with such predisposing factors.

A point of interest is the possibility of recurrent PDL in the following pregnancies. This has not been documented in previous reports but it should be considered and warning should be given to the patient beforehand. In our patient in case 3, PDL was more extensive in her second pregnancy and we believe that there may be an increased susceptibility in subsequent pregnancies. However, more substantial data are needed to confirm this hypothesis.

In summary, our report describes 4 women with PDL associated with erythema in pregnancy. As Koreans have similar skin types as the Japanese, the incidence of PDL is suspected to be high in Korea. However, to date, only two retrospective cases seen in the postpartum period have been reported in Korean literature. As most PDL are asymptomatic, it is likely that many cases are overlooked. Further studies and co-operation with obstetricians are needed to quantify the relative incidence of PDL in pregnancy. Careful history taking, physical examination and close long-term follow-up will enable us to determine the precise prognosis of this cosmetic problem.

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