Original Article

Pigmentary demarcation lines on the face in Saudi women

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ABSTRACT

Background: Pigmentary demarcation lines (PDL) are physiological abrupt transition lines between hyperpigmented skin and lighter areas. Recent evidence suggests that they involve the face. **Aims:** To survey facial PDL in Saudi females referred to general dermatology clinics for various complaints and determine any associated risks. **Methods:** Screening for facial lines was done in general dermatology clinics over a year. Whenever a patient was found to have facial PDL, a detailed questionnaire and examination were undertaken. **Results:** Out of 1033 patients screened, 144 patients (14%) were found to have at least one of the facial PDLs. The median age of onset was 16 years. The most common line was F with 76 patients (53%). Family history was positive in 51 patients (35%). **Conclusion:** Facial PDL is a common and chronic pigmentary problem in Saudi women. It should be recognized and differentiated from other similar diseases like melasma. A significant proportion of patients have a milder presentation.

Key words: Body, facial pigmentary demarcation lines, lines, hyperpigmentation

INTRODUCTION

Pigmentary demarcation lines (PDL) are borders of abrupt transition between hyperpigmented skin and lighter areas. They are thought to correspond to areas of peripheral cutaneous innervations. It can affect different parts of the body and according to the site they have been labeled A through E lines,[1] as shown in Table 1. It is a common finding, especially in women and darker skin types. It was found that around 79% of black women had at least one of these lines.[2]

Only recently, it was suggested that these lines may also occur on the face. Therefore, PDL have been reclassified this time to include lines F, G and H [Table 1 and Figure 1].[3] Unlike earlier lines which are hidden and carry little significance, facial lines cause more concern for patients.

We believe that PDL on the face is underdiagnosed. The concept is both new and evolving. We decided to survey female patients for these lines, and look for any risk factors.

METHODS

This is a survey where female patients were screened for facial PDL in three general dermatology clinics over a one-year period starting from March 2007. All patients were informed about the study and it was approved by the ethical committee in King Khalid University Hospital.

Due to the fact that facial PDL is rare in males only female patients were considered for the study. Patients were excluded if their pigmentation was preceded by any kind of facial eruption. They were all seen for various complaints in outpatient clinics. After examination, if the patient was found to have any of the facial PDL, a detailed questionnaire was then taken for its onset, course and relation to pregnancy (if applicable) and the presence of other lines in their bodies.

The lines were classified into F, G or H as suggested by Somani *et al.*[3] Lines F and G originate from the

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Table 1: Classification of Pigmentary Demarcation Lines which includes classical lines (A through E) and the newly added facila lines (F through H)

Line	Location
A	Lateral aspect of the upper anterior arms
B	Posteromedial portion of the lower limbs
C	Hypopigmented lines in pre- and parasternal areas
D	Posteromedial area of the spine
E	Bilateral Hypopigmented bands on the chest
F	V-shaped patch on lateral cheeks
G	W-shaped patch on lateral cheeks
H	Linear bands extending from lateral oral commissures

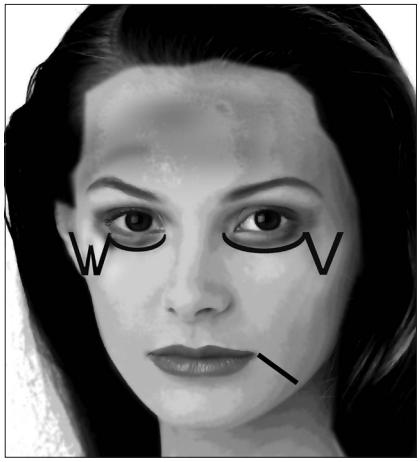

Figure 1: A diagram showing facial PDL: Line F adjacent to the left eye extending to infraorbital area, line G adjacent to the right eye, extending to infraorbital area and line H extending from the later corner of the mouth

left orbital rim as an inverted cone whereas Line H originates from the lateral mouth corner as shown in Table 1 and Figure 1. Patients were also examined for other lines if the patients reported them, (A through E) and involvement of the infraorbital area.

All data were coded and analyzed using the Statistical Package for Social Sciences (SPSS 9.0, SPSS Inc. Chicago, IL, USA).

RESULTS

One thousand and thirty-three female patients were screened. Their ages ranged from 3 to 55 years with a mean age of 29.3 years. Most patients' Fitzpatrick's skin types were III, IV or V (92.2% of all patients screened).

One hundred and forty-four patients (14%) were found to have facial PDL. The median age of onset was 16 years (SD 6.51). Of these lines, the most common type found was line F (53%) followed by line H (27%) and G (20%) as shown in Table 2. Some patients presented with a combination of lines. In 14 patients (9.7%) facial PDL was associated with body PDL (lines A through E). In 65 patients (45%), facial PDL extended to the infraorbital area, all of whom had Lines F or G.

Table 2: Facial PDL frequencies and percentages

Line	Frequency	Percentage
F	76	53
G	29	20
H	39	27

Family history was positive in 50 patients (35%), reflecting familial tendency. Whenever family history was positive, sisters and mothers (47% and 40% respectively) were the most common relatives to be affected. Fathers, brothers, aunts, daughters and cousins were also affected but to a lesser degree (13%).

In relation to pregnancy, 44 patients (31%) were pregnant at some point in their lives. Most of them (91%) felt that it got worse during pregnancy. Only four patients denied such aggravation.

DISCUSSION

Pigmentary demarcation lines (PDL) are physiological abrupt transition lines from areas of deeper pigmentation to lighter areas. They were first classified into five types, A through E.[1] Only recently it was suggested that these lines can also occur on the face and lines F, G and H were added.[3] The facial lines differ from the rest of the lines (A through E), in that they present later in life, usually around puberty (lines A to E tend to present in early childhood) and that they affect males less frequently.[2,3]

The pathogenesis of PDL is uncertain. Some authors believe that pigmentary mosaicism is the culprit,[4] many others believe that the axial-neural theory is more accurate,[5] pointing that these lines coincide with cutaneous nerve distribution.[6] They do not correspond to the lines of Blaschko, which mark the distribution of linear nevoid conditions, or dermatomal lines.[7,8] Others blamed inflammation of the cutaneous nerves during pregnancy, where nerves can be trapped by the growing uterus.[9]

Dominant inheritance has been suggested.[10] In our study 35% of patients had at least one family member affected with PDL. In comparison, family history was positive in 61% in a previous study.[3] However, patients can't be relied upon for diagnosing PDL in their relatives. They may have missed it or mistaken it for something else. It is also interesting that many patients didn't present to the clinic with facial PDL or even recognize it until they were told about it during examination. This spectrum represents a milder type of facial PDL which further supports the idea that it is a normal variation in skin pigmentation

The higher proportion of affected females may indicate hormonal influences. In another study,[3] only 0.74% of males had facial PDL, a tiny fraction of affected females (8.3%). Pregnancy is associated with worsening of many pigmentary problems.[11] In our series, 40 out of 44 pregnant women noticed that their facial lines got worse while pregnant.

Facial PDL has been classified into three types. According to Somani *et al*.,[3] Line F represents an inverted cone-shaped patch, extending from the lateral orbital rim and pointing inferiorly or inferolateraly [Figure 2]. Line G is similar to line F, but with two inverted cones with a rim of normal pigmentation in between forming a W-shaped patch [Figure 3]. Line H is a linear hyperpigmented patch extending from the lateral corners of the mouth [Figure 4].

We found that 9.7% of patients with facial PDL also had one of the body lines (Lines A through E). This could be considered indirect evidence that they have a common origin. It would have been helpful to compare biopsies taken from both locations and compare histopathology. However, due to the non-specific changes that might be seen in histopathology and the unsightly scar that they might leave behind on the face, we abstained from performing any biopsies.

Facial PDL should be considered in the differential of any bilateral hyperpigmentation on the face. Melasma can mimic PDL in many ways. However, facial PDL presents as a bilateral well-defined homogenous hyperpigmented patch, which is located and extending from either the lateral orbital rims or the corners of the mouth. Melasma, on the other hand, is blotchy and unlike facial PDL, it can occur in other parts of the face (for example forehead and nose).[11] We believe that many cases of facial PDL are misdiagnosed as melasma. Facial PDL is distinguished from post-inflammatory

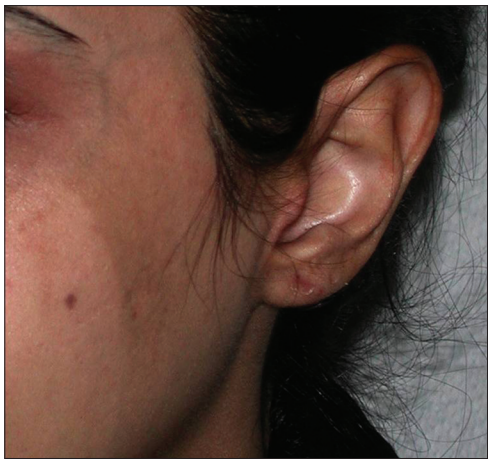

Figure 2: PDL type F, an inverted cone starting from the lateral orbit

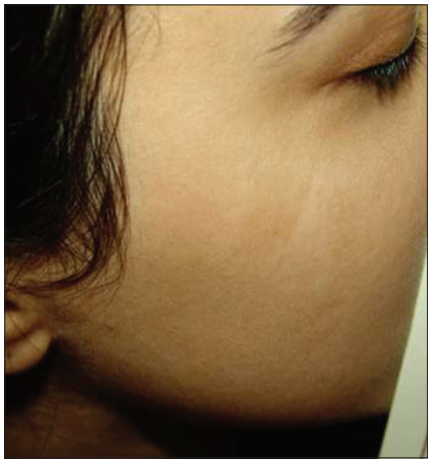

Figure 3: PDL type G, two inverted cones with a lighter skin in between

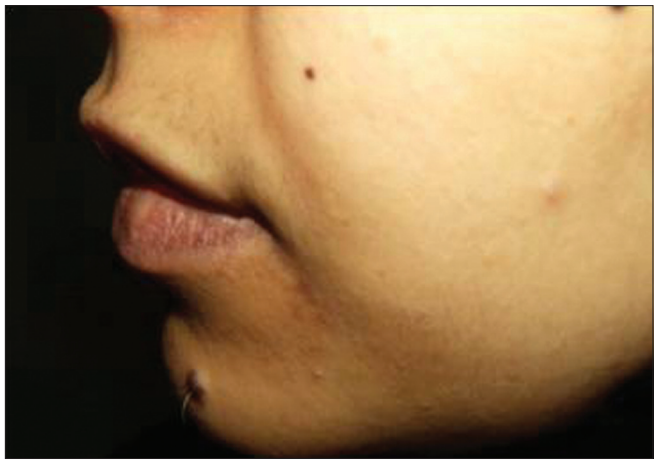

Figure 4: PDL type H, extending from the later oral corner to the mandible

hyperpigmentation by its chronic course, absence of prior history and well-defined borders.

Extension of facial PDL to the infraorbital area was observed in almost half of all patients (45%). This is seen with Lines F and G. It is not clear whether infraorbital hyperpigmentation is an independent process or just an extension of facial PDL. In a recent study, out of 100 patients with periorbital melanosis there were 92 who also had facial PDL. Interestingly, 67 patients reported that both their facial PDL and periorbital melanosis started at the same time. The remaining 25 patients didn't notice the facial PDL (and therefore couldn't tell when it started) but was picked up by the investigators.[12] Therefore, facial PDL and familial periorbital melanosis might represent the same entity.

To conclude, facial PDL is a common entity in Saudi women, one that is newly described and an evolving concept distinct from other pigmentary problems. Because of its persistent course it causes great concern to patients and is a challenge for dermatologists.

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