

Physiologic Skin Changes During Pregnancy

Tan KH, Rajasekaran T

Objective: The aim of this study was to evaluate the type, frequency and pattern of physiologic skin changes of our multiracial Singaporean women during pregnancy.

Materials and Methods: This study was conducted on 102 randomly selected term postpartum women seen between September 2008 to January 2009 in the obstetrics and gynecological unit of a women's hospital in Singapore. A complete cutaneous examination was done in all cases to document the presence of physiologic skin changes. Descriptive and chi-square statistics were used to analyse the data.

Results: Of the sample, 30 (29.4%) pregnant women were primigravida. Their age ranged from 17 to 45 years (mean 29 years). Striae gravidarum was seen in 51 (50.0%) cases, of which the abdomen ($n = 49$, 96.1%) was the most common site involved. The other common physiological change was linea nigra ($n = 91$, 89.2%). 'Tan' pigmentary demarcation lines on the thigh were only seen in 3 cases (2.9%). Despite the high percentage of women with physiological changes, less than half of them were concerned about it ($n = 48$, 47.1%), while a third self-intervened ($n = 39$, 38.2%). Ethnicity appeared to have some influence on the presence of skin changes.

Conclusions: This study brings into focus various skin changes during pregnancy in Singapore. The findings also highlight the perception of women to their skin changes and the lack of interventional options available for women who are concerned about these skin changes. A follow up study on available interventions and their effect on skin changes is recommended.

Keywords: Physiologic Skin Changes, Pregnancy, Striae Gravidarum, Linea Nigra, Pigmentary Demarcation Lines

Corresponding Author

K. H. Tan FRCOG MMed (O&G) FAMS

Senior Consultant

Division of Obstetrics & Gynaecology

KK Women's & Children's Hospital

100 Bukit Timah Road

Singapore 229899

Tel. +6563941323

Email address: [drkhtan100@gmail.com]

Tanujaa Rajasekaran MBBS

Medical Officer

Division of Obstetrics & Gynaecology

KK Women's and Children's Hospital, Singapore

INTRODUCTION

During pregnancy, dramatic endocrine, metabolic and immunologic changes occur. These changes are associated with many alterations in the skin. Likewise, patients' concerns range from cosmetic appearance to the chance of recurrence or temporary resolution (psoriasis) of the particular skin problem during a subsequent pregnancy.

To date, there has not been any study done in Singapore to evaluate physiologic skin changes during pregnancy. Overseas literature on this topic are also very limited.^(1,2) This study will fill the paucity of research by determining the type, frequency and pattern of physiologic skin changes in Singapore women during pregnancy.

METHODS

This study was conducted on 102 randomly selected postpartum women seen between September 2008 to January 2009 in the obstetrics and gynecological unit of a women's hospital in Singapore. They had delivered at term. A proforma was used. History including patient demographics and concerns of patients regarding skin changes were elicited from both patient themselves and case notes. A complete cutaneous examination was done in all cases to document the presence of physiologic skin changes. Weight at the first trimester and at the last visit at term were obtained from the case record of each patient. Descriptive statistics were used and the results were reported as frequencies. The chi-squared test was used for dichotomous variables and t-test was used for continuous variables that were normally distributed. A p value of $<.05$ was considered significant. Approval for this study was obtained from the hospital's Institution Review Board (IRB). All results were kept confidential and data were aggregated to avoid identification of individuals.

RESULTS

Out of the 102 women, 36 (35.3%) were Chinese, 44 (43.1%) were Malays, 13 (12.7%) were Indians and the remaining 9 (8.8%) were of minority races. Of the sample, 30 (29.4%) were primigravidas. Their age ranged from 17 to 45 years (mean 29 years).

Three main physiological changes of pregnancy were seen in our sample namely, striae gravidarum, linea nigra and 'Tan' line (pigmentary demarcation line) (Table 1 and Figures 1 & 2).

Striae was most commonly seen in the abdomen ($n=49$, 96.1%), followed by hip ($n=18$, 35.3%), thigh ($n=17$, 33.3%), and buttocks ($n=5$, 9.8%). Indians has the highest proportion of striae (76.9%), followed by Malays (54.5%) and Chinese (36.1%) (see Table 2). The difference between Chinese and Indians was statistically significance ($p<0.05$) while the difference between Chinese and Malays just approach statistically significance in this study ($p=0.05$) Striae was more commonly seen in primips (60.0%) than multips (45.8%).

The other common physiological change was linea nigra ($n=91$, 89.2%). Linea nigra was also seen most frequently among Indians (92.3%), followed by Malays (90.9%) and Chinese (83.2%) (see Table 2). Linea nigra are seen in 86.7% of primips and were 90.1% of the multips.

Three cases of pigmentary demarcation lines were seen in this study (Table 2). These 'Tan' line refers to a visually clear straight division on the human skin between an area of comparative pigmentation that appeared to have been 'suntanned' relative to other areas. One was Chinese, one was Indian and the other was of a minority race. Two of the 3 with pigmentary demarcation lines were multips. One of them reported resolution after previous pregnancy and a recurrence in this pregnancy.

Primiparous patients had higher frequency of skin changes in pregnancy (Table 3). Those who developed striae had a mean weight gain of 8.8kg, compared to a mean 6.9kg weight gain among those who did not develop striae. However, this result was not statistically significant. Likewise, those who developed pigmentary demarcation lines had a mean weight gain of 11.9kg compared to 7.9kg among those who did not develop. Again, this result was not statistically significant. There was no difference in weight gain between those who developed linea nigra and those who did not.

Indians and Malays have higher mean weight at term than Chinese in this study. Indians also have a higher mean weight gain in pregnancy (Table 4).

Despite the high percentage of women with physiological changes, less than half of them were concerned about it ($n=48$, 47.1%), while a third self-intervened ($n=39$, 38.2%) Table 5. Interventions include use of cocoa butter cream, nivea cream, other forms of topical creams and massage therapy. There was no surgical or laser therapy used.

DISCUSSION

Striae gravidarum develop commonly among women in pregnancy. In our study striae was seen in 50.0% of the women. The lowest incidence was among the Chinese in our study. The lower incidence of striae in our Chinese population (36.1%) may be attributed to having the lowest maternal mean weight at term as well as due to genetic and phenotypic differences among ethnic groups.

Pigmentary 'Tan' demarcation lines are physiological abrupt transition lines from areas of deeper pigmentation to the area with less pigmentation. The abrupt transition gave the appearance of well demarcated line separating a 'tan' area (Fig. 2) to the other normal skin tone area. These 'Tan' lines are most obvious at the medial aspect

of the thigh and calf separating the posterior tan-like area from the anterior normal skin color area.

Excessive weight gain has an adverse effect on skin changes with increased frequency of striae. The higher incidence of skin changes in Indians and Malays may be partly attributed to the higher mean weight for Indians and Malays and the higher mean weight gain for Indians.

CONCLUSION

This study brings into focus various skin changes during pregnancy in Singapore multiracial population. The findings also highlight the perception of women to their skin changes in pregnancy and association with weight gain. A follow up study on awareness of skin changes and weight gain as well as available interventions and their effect on skin changes is recommended.

REFERENCES

1. Kumari R, Jaisankar TJ, Thappa DM. A clinical study of skin changes in pregnancy. *Indian Journal of Dermatology* 2007; 73:141.
2. Muzaffar F, Hussain I, Haroon TS. Physiologic skin changes during pregnancy: A study of 140 cases. *International Journal of Dermatology* 1998; 37: 429-431.

Table 1. Physiologic Skin Changes

Type of Physiologic Skin Changes	No	%
Striae Gravidarum	51	50.0
Linea Nigra	91	89.2
'Tan' Line - Pigmentary Demarcation Line	3	2.9

Table 2. Distribution of Skin Changes by Race

Race	N	Striae	Linea Nigra	'Tan' Line - Pigmentary Demarcation
Chinese	36	13 (36.1%)	30 (83.3%)	1 (2.8%)
Malay	44	24 (54.5%)	40 (90.9%)	0 (0%)
Indian	13	10 (76.9%)	12 (92.3%)	1 (7.7%)
Others	9	4 (44.4%)	9 (100%)	1 (11.1%)
Total	102	51 (50%)	91 (89.2%)	3 (2.9%)

Table 3. Distribution of Skin Changes by Parity

Parity	N	Striae	Linea Nigra	'Tan' Line - Pigmentary Demarcation
Primiparity	30	18 (60%)	26 (86.7%)	1 (3.3%)
Multiparity	72	33 (45.8%)	65 (90.1%)	2 (2.8%)
Total	102	51 (50%)	91 (89.2%)	3 (2.9%)

Table 4. Mean Weight at Term and Mean Weight Gain by Race

Race	Mean Weight at Term (kg)	SD	Mean Weight Gain (kg)	SD
Chinese	64.1	7.1	8.0	4.0
Malay	71.3	10.9	7.2	4.4
Indian	72.0	9.2	9.1	5.7
Others	65.7	7.0	9.7	3.4
Overall	68.2	9.7	7.9	4.4

Table 5. Usage of Interventions to Avoid and Decrease Pigmentation or Striae

Race	N	Used Intervention to Avoid and Decrease Pigmentation or Striae
Chinese	36	12 (33.3%)
Malay	44	18 (40.9%)
Indian	13	7 (53.8%)
Others	9	2 (22.2%)
Overall	102	39 (38.2%)

Fig 1. Linea nigra and striae gravidarum



Fig 2. 'Tan' Line - Pigmentary demarcation line at the thigh and calf. Note the tan appearances of the posterior medial area of the thigh and calf.

