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Original Article

Is it possible to prevent striae gravidarum?

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Abstract

Background: Striae gravidarum (SG), commonly called stretch marks, is an important cosmetic problem which is not treatable, although preventive measures might be effective. The aim of this study was to determine individual risk factors causing SG and the degree to which preventive measures could be effective.
Methods: This prospective observational study included 211 singleton primiparous pregnant women who were hospitalized for birth and who did not have systemic diseases or other risk factors, like drug use or polyhydramnios. Patients were examined and divided into two groups with respect to whether or not they had striae. Individual features were compared between the two groups.
Results: While 159 patients (75.4%) had SG, 52 (24.6%) did not. Patients with striae had a significantly lower mean age and higher mean preconceptional body mass indices than ones without striae ($p < 0.001$ and $p = 0.001$, respectively). Family history ($p = 0.002$), having a male baby ($p = 0.042$), and lower educational level ($p = 0.033$) were also statistically significant in predicting striae. Use of preventive oil or drugs, smoking status, skin type, water intake, and level of financial income did not significantly predict SG.
Conclusion: Informing women preconceptionally on the importance of modifiable risk factors, such as body weight and maternal age before pregnancy, can be useful, considering that stretch marks are carried for a lifetime and there is no conclusive treatment.

Keywords: pregnancy; preventive measures; risk factors; striae distensae

1. Introduction

Stretch marks on the skin which develop on the mother during pregnancy are termed striae gravidarum (SG). Although they do not lead to medical problems, they are considered an important cosmetic problem since they may remain permanently on the skin. Striae which are red or purple in color at onset lose their color in time and become pale streaks. In severe cases, SG may lead to itchiness and restlessness in the pregnant woman.[1] The prevalence of SG varies from 50% to 90%, according to various sources.[2] They may occur anywhere, especially on the abdomen, breasts, hips, and legs.[3,4]

The etiology of SG is unknown. It has been stated that estrogen, relaxin, and adrenocortical hormones (as in Cushing's disease) may play a role in the development of striae due to their effect on collagenous tissue.[5] In another study, it was reported that decreases in elastin and fibrillin in the dermis may influence SG.[6]

Many risk factors have been suggested for the development of SG, such as prepregnancy maternal weight,[7] weight gain during pregnancy,[8] maternal age,[9] skin structure,[10] family history,[1] race, and birth weight; these have been investigated, but their effect has not been clearly proven.[5,11,12] In 1959, the "stretch" hypothesis was put forward by Poidevin,[13] and accordingly, it was thought that rapid growth in abdominal and hip circumference during pregnancy may lead to additional striae, but no relationship

Conflicts of interest: The authors declare that they have no conflicts of interest related to the subject matter or materials discussed in this article.

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could be demonstrated between these factors. In various studies, no definitive method could be demonstrated to prevent or treat SG development.[14]

The aim of the present study was to investigate the effect of daily fluid intake and preventive measures, in addition to previously investigated risk factors, on the development of SG in a Turkish pregnant population.

2. Methods

A total of 211 term (37 weeks or more) primiparous pregnant women who were admitted to Zekai Tahir Burak Women's Health Care Training and Research Hospital between August 2013 and October 2013 with onset of labor were included in the present prospective observational cohort study. Approval was obtained from the ethics committee of the hospital (approval date/number: 23.08.2013/15), and written informed consent was obtained from every patient. Cases with multiple pregnancy and polyhydramnios (which increases abdominal circumference), foreknown systemic diseases (diabetes, hypertension, goiter, asthma, collagen tissue disease), those who used drugs, except for multivitamin preparations and iron compounds and cream for skin scars, and those who were not eligible to answer a questionnaire were excluded from the study. The age of the patient, pregnancy week, presence of SG, week of onset of SG, treatment used to prevent SG (oil/cream ointment, laser treatment), history of smoking, daily mean fluid intake (liters), skin type of the woman according to the Fitzpatrick classification,[15] the presence of striae in the adolescent period, a history of SG in the mother or sister, the presence of striae in other sites in the body, weight and body mass index (BMI; kg/m^2) prior to pregnancy, BMI and abdominal circumference at admission (in cm from the level of umbilicus), birth weight and sex of the infant, income level of the family according to the data of Turkish Statistics Institution, and education level of the mother, were recorded on study forms.

Cases were divided into two groups: those with striae and those without striae. Factors that could have an effect on striae development were compared between groups. In cases with SG, striae on the abdominal region were scored by the same investigator, according to the Davey method.[11] Accordingly, the abdominal region was divided into four main quadrants (lower right, upper right, lower left, upper left) and each patient was scored in the range 0−8, according to the presence of striae in each quadrant: 0 (absent), 1 (a little), or 2 (much).

All analyses were conducted using SPSS software, version 17.0 (SPSS Inc., Chicago, IL, USA). Variables were distributed homogenously in SG and non-SG groups. Variables were analyzed at the 95% confidence level. Descriptive statistics, Student *t* test, Chi-square (χ^2), and logistic regression analyses were used. To assess the association of SG and the amount of daily water consumption, the χ^2test for linear trend was performed. A p value < 0.05 was considered statistically significant.

3. Results

Of 211 study participants, 159 (75.4%) had SG (Group 1) and 52 (24.6%) did not have SG (Group 2). In Group 1, 71 had SG (33.6%) only in the abdominal region, 31 (14.7%) only in other regions (hip, thigh, breast), and 57 (27%) in both abdominal and other regions. When participants in Group 1 were evaluated in terms of the onset time of striae, it was established that SG developed most commonly between 29 and 36 weeks of pregnancy ($n = 60$; 37.7%), and rarely within the first 12 weeks in women without striae before pregnancy ($n = 2$; 1.3%). The severity of SG in Group 1, according to Davey scoring, was as follows: 33.9% ($n = 54$) were mild (score 1−2), 31.4% ($n = 50$) were moderate (score 3−6), and 15% ($n = 24$) were severe (score 7−8). Pregnant women included in the study were divided into three groups, according to their skin types: Type A (Fitzpatrick Types 1 and 2), $n = 64$, 30.3%; Type B (Fitzpatrick Type 3), $n = 83$, 39.3%; Type C (Fitzpatrick Type 4), $n = 64$, 30.3%. Of pregnant women, 52.1% ($n = 110$) used no antistretch cream or oil. Some 34.6% of them ($n = 73$) used only oils (almond, cocoa, and olive oil) from the second trimester on, 10% ($n = 21$) used only antistretch cream in the same time period, and 3.3% ($n = 7$) used both oil and cream.

With regard to sociodemographic characteristics, no significant difference was found between groups in terms of methods for preventing striae, smoking, skin type, daily water consumption, striae history in adolescence, and income level. In the SG group, the presence of positive family history was significantly higher than in the group without SG ($p = 0.002$). In addition, the presence of a male fetus ($p = 0.042$) and low education level of the mother ($p = 0.033$) were also found to be significant factors in the development of SG (Table 1).

The mean age of the SG group was significantly lower than that of the non-SG group (23.1 ± 4.4 years vs. 26 ± 4.9 years, respectively; $p < 0.001$). In the group without SG, prepregnancy BMI was significantly lower than in the SG group (21.2 ± 3.5 vs. 23.2 ± 3.7, respectively; $p = 0.001$). The BMI value at admission was significantly higher in the SG group than in the group without SG (28.9 ± 3.5 vs. 26.6 ± 3.8, respectively; $p < 0.001$). In addition, abdominal circumference, the ratio of abdominal circumference to the length of the woman, and birth weight of the infant were significantly higher in the SG group. No significant difference was found between the two groups with regard to the difference between BMI at birth and prepregnancy BMI, weight gain during pregnancy, the ratio of weight gain to length, and gestational age at birth (Table 2).

According to logistic regression analysis, including all variables found to be significant in one-by-one comparisons, i.e., age, prepregnancy BMI, BMI at admission, abdominal circumference, birth weight, family history, sex of the infant, and maternal education level, it was established that each unit of decrease in maternal age increased the risk of SG by 1.15-fold [relative risk: 0.87; 95% confidence interval: 0.80−0.94] (Table 3).