sessed simultaneously with fetal hematocrit. When the fetal platelet count is less than $50 \times 10^9/L$, a transfusion of concentrated platelets should be performed to prevent fatal exsanguination.

We do not believe that it is necessary to transfuse platelets at cordocentesis prophylactically if the platelet count can be obtained in a few minutes and the procedure is continuously monitored with ultrasound. In such cases a cordocentesis would be preferable at the placental cord insertion. Although there are no clear data to support this suggestion, our experience leads us to believe that it might minimize the risk of bleeding.

### Risk factors for the development of striae gravidarum

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#### BACKGROUND AND OBJECTIVES
Striae distensae (“stretch marks”), called striae gravidarum (SG) when they occur in pregnancy, are a common skin problem of considerable cosmetic concern to many patients. Their cause remains unknown but clearly relates to changes in the structures that provide the skin with its tensile strength and elasticity. Mechanical stretching of the skin in association with hormonal factors has been implicated in the pathogenesis.

According to various studies, SG occurs in 50-90% of pregnant women. Proposed risk factors, most of which have not been substantiated, include family history, race, skin type, birthweight, baseline body mass index (BMI), age, weight gain, and poor nutrition.

We conducted a study to determine the incidence of SG in primiparous women in our population and to identify the risk factors associated with its development.

#### MATERIALS AND METHODS
A cross-sectional study was conducted at a large private teaching hospital in Beirut, Lebanon. All primiparas with singleton gestations delivering during a 6-month period (February through July 2005) were invited to participate in the study irrespective of gestational age at delivery.

All eligible participants were assessed postpartum with a 22-item data collection tool before hospital discharge. Information was collected from their medical charts about socioeconomic status, gestational age at delivery, total weight gain during pregnancy, current weight, fetal sex, and fetal birthweight. Patients admitted at the expense of the Ministry of Health were considered to be of low socioeconomic status; those with private insurance, of high socioeconomic status. Patients were asked whether they had used creams to prevent SG during pregnancy, smoking history, and family history of SG. Family history of SG was considered positive if the woman’s mother and/or sister had developed SG during pregnancy. Skin type was determined by interview questions based on the Fitzpatrick classification, which categorizes skin according to the extent of tanning or burning with sun exposure.

One of 3 researchers assessed the presence of SG on the abdomen, thighs, and breasts based on a scale developed and validated by the research team. The scale is based on the total surface area of the affected body part that is covered by SG: mild, $< 25$%; moderate, 25-50%; and severe, $> 50$%.

Assuming a 50% prevalence of SG, a total of 113 patients would be required to achieve a clinical significance of 15% at a power of 90% and a significance level of .05. The data were entered and analyzed using SPSS 13.0 (Chicago, IL). Two different outcomes were considered: (1) women with any SG (mild, moderate, or severe) on the abdomen, thighs, or breasts versus those with no SG in any of those sites; and (2) women with moderate and/or severe SG in any of the 3 sites versus women who had either mild SG or none.

#### RESULTS
During the study period, 532 women delivered at the hospital. Of these, 163 were eligible to participate in the study; 41 were discharged before they could be approached, and 9 did not wish to participate. One eligible woman was not approached because her infant was stillborn. Two other women were excluded from the
final analysis because of missing information.

All eligible patients who were not formally assessed were compared to the women \( n = 110 \) included in the study. No significant differences were found in maternal age, socioeconomic status, gestational age at delivery, fetal sex, or birthweight.

Of the 110 women enrolled in the study, 67 (61%) developed SG in at least 1 of the assessed sites. Fifty-three (48%) developed SG on the abdomen; 27 (25%) on the breasts; and 27 (25%) on the thighs during pregnancy. Of abdominal striae, 17 (32%) were mild, 18 (34%) moderate, and 18 (34%) severe. Regarding striae on the breasts and thighs, 19 (70%) women reported them as mild; 7 (26%), as moderate; and 1 (4%) as severe.

Most (93%) of the women in the study delivered at term. The majority (77%) of women were 24–34 years of age. Mean maternal age was 28 years. Weight gained during pregnancy ranged from 3 to 33 kg (mean, 14.4 kg). Birthweight ranged from 677 to 4115 grams (mean, 3143 g).

Women who developed SG were significantly younger and had gained significantly more weight during pregnancy than those who did not develop SG. Birthweight and gestational age at delivery were strongly associated with risk of developing moderate to severe SG.

The predominant skin types in our population were Fitzpatrick III (41%) and IV (32%). Most of the women (88%) were nonsmokers; 45% were of low socioeconomic status. Sixty-seven women (61%) had used a cream or lotion during pregnancy in an attempt to prevent SG.

Sixty-five (59%) of the infants delivered were male and 47 (43%) were female. No relationship was noted between skin type, socioeconomic status, smoking, cream use, fetal sex, or family history and the risk of developing SG. However, women with a family history of SG were more likely to develop moderate to severe SG than were those with no family history of SG (Table).

### TABLE

| Distribution of striae gravidarum and degree of severity by selected maternal characteristics |
|------------------------------------------------------------------------------------------------|
| **Presence of SG** | **No** | **P value** | **Yes** | **No** | **P value** |
|---------------------|--------|-------------|---------|--------|-------------|
| **Family history of SG** |  |  |  |  |  |
| Yes | 48 (64.9) | 26 (35.1) | .151 | 34 (45.3) | 40 (54.1) | .019* |
| No | 16 (50.0) | 16 (50.0) | | 7 (21.9) | 25 (78.1) | |
| **Cream use** |  |  |  |  |  |
| Yes | 43 (64.2) | 24 (35.8) | .380 | 28 (41.8) | 39 (58.2) | .331 |
| No | 24 (55.8) | 19 (44.2) | | 14 (32.6) | 29 (67.4) | |
| **Current smoking†** |  |  |  |  |  |
| Yes | 4 (57.1) | 3 (42.9) | .779 | 3 (42.9) | 4 (57.1) | .713 |
| No | 59 (62.1) | 36 (37.8) | | 37 (38.9) | 58 (61.1) | |
| Stopped | 4 (50.0) | 4 (50.0) | | 2 (25.0) | 6 (75.0) | |
| **Skin type-Fitzgerald classification** |  |  |  |  |  |
| I/II | 12 (54.5) | 10 (45.5) | .132 | 9 (40.9) | 13 (59.1) | .923 |
| III/IV | 52 (65.8) | 27 (34.2) | | 30 (38.0) | 49 (62.0) | |
| V/VI | 3 (33.3) | 6 (66.7) | | 3 (33.3) | 6 (66.7) | |
| **Baby’s sex** |  |  |  |  |  |
| Male | 38 (60.3) | 25 (39.7) | .883 | 23 (36.5) | 40 (63.5) | .676 |
| Female | 29 (61.7) | 18 (38.3) | | 19 (40.4) | 28 (59.6) | |
| **Socioeconomic status** |  |  |  |  |  |
| High | 34 (56.7) | 26 (43.3) | .439 | 21 (35.0) | 39 (65.0) | .699 |
| Low | 33 (66.0) | 17 (34.0) | | 21 (42.0) | 29 (58.0) | |

* SG, striae gravidarum.
† Current Smoking was labeled ‘yes’ if the patient smoked during pregnancy, ‘no’ if she has never smoked, and ‘stopped’ if smoking was stopped before pregnancy.

**COMMENT**

This study provides a clinical assessment of the prevalence of SG and associated risk factors in a cohort of racially homogeneous women at a single tertiary-care referral center. The evaluation was based...
Women with a positive family history of SG were more likely to develop moderate to severe SG, suggesting that genetic factors play a role in the development of SG. Unfortunately, our study population was too racially homogeneous to determine any differences with regard to SG risk related to skin type.

Similarly, our cohort contained too few smokers to correlate smoking with SG development. Fetal sex did not correlate with SG development.

A large proportion of our population had used at least 1 cream or lotion to prevent the development of SG; however, we found no correlation between cream use and SG development. Women using topical treatments probably began to apply them after noting the development of SG.

During prenatal visits, women often ask about their risk of developing SG and how to prevent them. Our findings can help physicians answer some of these questions in counseling patients. Future research should focus on preventive methods that may reduce the likelihood of SG development.

**CLINICAL IMPLICATIONS**

- High birthweight, excessive weight gain during pregnancy, and family history (although not to a statistically significant extent) may increase the risk of developing striae gravidarum. Factors that seem to make no difference include socioeconomic status, skin type, and fetal sex. Physicians may wish to use these findings when counseling pregnant patients about SG.

- Future research should consider methods to prevent striae gravidarum from developing.