Relation of Striae Gravidarum with Cesarean Scar and Peritoneal Adhesions

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Abstract

Objective: to find out the relation between striae gravidarum and, cesarean scar and peritoneal adhesions. **Study Design**: Cross sectional Study. **Place and Study Duration:** Department of Gynecology and Obstetrics, DG Khan Teaching Hospital Multan, from January 2018 to June 2018. **Material and methods:** A total number of 150 patients presenting to the department of gynecology and obstetrics for cesarean section were included in the study. Severity of striae gravidarum was assessed using Davey scoring system. Modified Blauer classification was used to define the intraperitoneal adhesions in five categories. Three groups were designed group 1, 2 and 3. In group 1 those women were involved that had no striae gravidarum, in group 2 were those women who had mild to moderate number of striae gravidarum and in group 3 women with severe amount of striae gravidarum were included. Students T test and Mann-Whitney test was applied to compare the two groups. Frequency and percentages were calculated for categorical variables and mean and standard deviation was calculated for continuous variables. P value of less than or equal to 0.05 was considered as statistically significant. **Results:** Grade 2-4 intraperitoneal adhesions, keloids and pigmentations were more in Group 2 and Group 3 but no statistically significant difference was present (p-value 0.517, 0.427 and 0.372, respectively). The appearance of scar was also not different among the three groups (p=0.541). Scar length was more in Group-3 (p=0.289) but the width was more in Group-1 (p=0.248) with no statistically significant difference. **Conclusion:** The results of this study show that striae gravidarum was associated with scar characteristics but no correlation between striae gravidarum and intraperitoneal adhesions could be observed as such.

Keywords: Striae Gravidarum, Cesarean Section, Abdominal Adhesions

Introduction:

Other name of striae gravidarum is striae distensae. These striae occur in various extents during the pregnancy and are very commonly observed during the gestation [1]. Probable risk factors of striae gravidarum involve, age, weight, increase in BMI during pregnancy, BMI of the new born and ethnicity of the patients as well [2]. Despite the recognition of all these risk factors no specific etiology has been defined as a cause of this condition during the pregnancy [3]. Cleavage of collagen fibers as result of fast stretching of skin may be the probable case of development of striae during pregnancy. Type of collagen fibers and its total amount determines the elasticity and striae development as poor elasticity of the skin can result in easy cleavage of the collagen fibers and thus formation of striae gravidarum. Other probable cause can be reduced amount of elastin and fibrin in dermis and hormonal effects which might result in structural changes in connective tissue may also result in formation of striae gravidarum [4, 5]. As it has been evident from multiple previous studies that cesarean section which is performed very commonly all over the world carries the risk of potential adverse complications like intraperitoneal adhesions resulting in chronic pelvic pain, infertility and injury to bladder or bowel.

Determination of the presence of intraperitoneal adhesions is very difficult [6]. Moreover it is also very difficult to assess if the complications are going to be present in women who had major abdominal surgeries [7]. This emphasizes on the need that preoperative measures must be taken in women who are at risk of developing the adhesions and thus such women should be referred to centers with tertiary care in order to avoid and deal with possible complications. No way or technique is present at the moment which can be used to diagnose the development of adhesions in patients prior to the repeat abdominal surgery like c-section. Formation of both intraperitoneal adhesions and striae gravidarum involve the protective role of elastin fibers and thus share almost similar pathway of tissue healing [8]. This study aims at finding the relation between striae gravidarum and abdominal cars with intraperitoneal adhesions. This could help in determining the predictive value of striae gravidarum and abdominal scars in order to evaluate the presence or absence of abdominal adhesions.

Material and Method:

This is cross sectional study performed in Department of Gynecology and Obstetrics, DG Khan Teaching Hospital Multan, from January 2018 to June 2018.. A total number of 150 patients presenting to the department of gynecology and obstetrics for cesarean section were included in the study. Informed consent was obtained from the participants prior to the enrolment in the study. Ethical approval was obtained from hospital ethics committee. Non probability consecutive sampling technique was used to collect the sample. Reference for this study was obtained from a previous study performed by Esra Yasar Celik et al [9]. Patients presenting for cesarean section, with the history of at least one prior cesarean section were included in this study. Patients with previous vaginal delivery, suffering from endometriosis, pelvic inflammatory disease, abdominal or pelvic surgery other than cesarean section, multiple pregnancies, steroid use, infectious complications after last cesarean section including abscesses, wound infection and endometritis etc were excluded from this study. At the time of admission following parameters were measured and recorded in the form of a performed performa; age, parity, gravidity, gestational age of delivery, past and current, change in BMI during gestation. Moreover, striae scores, evidence of striae on different body parts and properties of incisional scar were noted. Severity of striae gravidarum was assessed using Davey scoring system. Davey scoring system divides abdomen into quadrants, at each quadrant scoring is done as; 0 for no striae, 1 for moderate, or 2 for multiple striae. Sum of scores was sorted as 0-8. Three severity of striae categories were defined as, 0=absent, 1-2=mild, 3-8=severe.

All the procedures were performed the researcher himself. Color of scar was observed and recorded based on the pigmentation of scar and plane of scar was termed as depressed, elevated or flat. Moreover presence of keloids was aslo noted. Obstetric history involved data regarding the indication, time and gestational age at last cesarean section, history of GDM (gestational diabetes mellitus), fetal macrosomy, polyhydromnios, BMI at the time of the delivery, weight gain during pregnancy, smoking, medication history, and any other chronic illness. Modified Blauer classification was used to define the intraperitoneal adhesions in five categories. Five grades of intraperitoneal adhesion are, 0 indicated no adhesions, 1-2 indicated easily separable localized adhesions, 3 indicated extensive adhesions and 4 indicated adhesions present between bladder or uterus and the intestines. Three groups were designed group 1, 2 and 3. In group 1 those women were involved that had no striae gravidarum, in group 2 were those women who had mild to moderate number of striae gravidarum and in group 3 women with severe amount of striae gravidarum were included. Comparison between was made on the basis of characteristics of scars and intraperitoneal adhesions grades. Data thus collected was subjected to statistical analysis with help of computer software SPSS version 23. Students T test and Mann-Whitney test was applied to compare the two groups. Frequency and percentages were calculated for categorical variables and mean and standard deviation was calculated for continuous variables. P value of less than or equal to 0.05 was considered as statistically significant.

Results:

Three groups were compared, group-1 with zero, Group 2 with mild and Group 3 with severe SG and no considerable difference in age, gravida, abortions, level of education, gap between two cesarean sections, birth weight of the baby born in previous cesarean section and birth weight of the baby born in current cesarean section (p>0.05). SG in previous pregnancy and history of SG in family were considerably more in Group 3 (p-value <0.001 and 0.005, respectively). Striae on buttocks and breast were significantly more in Group-1 while striae on legs were significantly more in Group-3 (p-value 0.004, 0.024 and 0.008, respectively). BMI in previous C/S, BMI in present C/S, GW in previous C/S and GW in present C/S were highest in Group-3 and lowest in Group-1 and was statistically significant different (p-value 0.017, 0.040, 0.002 and <0.001, respectively). Table-I

Grade 2-4 intraperitoneal adhesions, keloids and pigmentations were more in Group 2 and Group 3 but no statistically significant difference was present (p-value 0.517, 0.427 and 0.372, respectively). The appearance of scar was also not different among the three groups (p=0.541). Scar length was more in Group-3 (p=0.289) but the width was more in Group-1 (p=0.248) with no statistically significant difference. Table-II

Table-I

Baseline Data

Variable	Group 1 n=47 Zero	Group 2 n=59 Mild	Group 3 n=44 Severe	P value
Age (yrs)	29.13±4.35	28.49±4.89	27.84±5.87	0.479
Gravidity (2/3/4/>4)	13/19/15/0	13/24/19/3	12/12/15/5	0.279
Abortions (0/1/2/>2)	24/15/8/0	23/22/13/1	19/12/10/3	0.378
Education (primary/intermediate/college)	14/16/17	15/23/21	12/21/11	0.664
Income (low/middle/high)	11/25/11	10/32/17	12/23/9	0.725
SG in first pregnancy (+/-)	6/41	12/47	36/8	<0.001
Family history of SG (+/-)	24/23	30/29	35/9	0.005
Striae on Buttocks (+/-)	37/10	29/30	31/13	0.004
Striae on legs (+/-)	26/21	28/31	34/10	0.008
Striae on breast (+/-)	36/11	30/29	26/18	0.024
interval b\w 2 C-sections, (yrs)	4.55±1.21	4.31±1.25	4.25±1.39	0.476
Birth weight of 1st baby, grams	2820.62±442.87	2832.34±550.61	2899.18±464.07	0.714
Birth weight of 2nd baby, grams	2721.64±485.88	2765.53±486.14	2889.30±471.79	0.231
BMI at previous C/S	26 (25-29)	28 (26-29)	29 (27-32)	0.017
BMI at present C/S	27 (25-29)	28 (26-29)	29 (28-31.75)	0.040
GA at first C/S	38 (37-38)	39 (38-39)	40 (40-41)	0.002
GA at present C/S	37 (37-39)	39 (38-40)	39 (38-41)	<0.001

Table-II

IPA score and scar features

Variable	Group 1 n=47 Zero	Group 2 n=59 Mild	Group 3 n=44 Severe	P value
IPAs (0 to1/ 2 to4)	38/9	42/17	33/11	0.517
Keloids (+/-)	9/38	12/47	13/31	0.427
Pigmentation (+/-)	11/36	16/43	16/28	0.372
Scar appearance (flat/depressed/elevated)	32/6/9	39/7/13	30/9/5	0.541
Scar length, cm	14.89±1.99	14.97±1.41	15.48±2.41	0.289
Scar width, cm	2.69±0.69	2.54±0.52	2.51±0.37	0.248

Discussion:

Over the years rate of primary cesarean section has increased while the rate of vaginal birth after the cesarean section has decreased enormously [10]. A previous study has reported the overall average rate of cesarean section all over the world to be 15 percent approximately with many discrepancies among different countries and even within different countries [11]. Intra abdominal adhesions may result in serious complications including chronic pelvic pain, bowel injury, infertility, bladder injury, bowel obstruction and increased duration of the surgery and its cost [12]. Relaxin hormone has been reported to decrease the collaged production and increasing the collagen breakdown and thus is helpful in inhibiting the excessive collagen buildup [13]. In a study it was found that in pregnant women with striae gravidarum amount of relaxin was lower as compared to the women with no striate gravidarum [14].

Another study by Brecht et al [15] showed that relaxin is involved in the inhibition of primary steps of vascular formation. Relaxin is a potent vasodilator and anti fibrotic agent. Thus it can be concluded from these observations that women with greater number of striae gravidarum are more likely to have greater number of keloids, non flat scar and intraperitoneal adhesions. In present study however no correlation between striae gravidarum and intraperitoneal adhesions could be found. In a previous study sensitivity and specificity of striae gravidarum in prediction of intraperitoneal adhesions has been reported be 95.2 percent and 29.4% respectively [16]. More severe striae gravidarum were associated with poor sensitivity but higher specificity for the prediction of intraperitoneal adhesions.

In a previous study the results showed that as the scores for abdominal striae gravidarum increased, the score for abdominal adhesions decreased with it. This makes the scoring system of striae gravidarum as very useful, easy to apply, adjunctive, inexpensive, observational and feasible method to predict and provide clues to the presence of intraperitoneal adhesions in pregnant women scheduled for another cesarean section [8]. Another similar study also deduced that presence and quantification of abdominal striae gravidarum in pregnant women undergoing cesarean section is a reliable tool which can provide the surgeon with necessary information regarding the status of abdominal adhesions [17]. Similarly abdominal scars also have a relation with the possible presence of abdominal adhesions as a study revealed that intra abdominal adhesions were related to depressed abdominal scars but these adhesions had no association with the level of pigmentation of the scar [18].

Conclusion:

The results of this study show that striae gravidarum was associated with scar characteristics but no correlation between striae gravidarum and intraperitoneal adhesions could be observed as such.

Conflict of interest:

There was no conflict of interest.

References:

1- Picard D, Sellier S, Houivet E, Marpeau L, Fournet P, Thobois B, Bénichou J, Joly P. Incidence and risk factors for striae gravidarum. J Am Acad Dermatol. 2015 Oct 1;73(4):699-700.

2- Tang-Lin L, Liew HM, Koh MJ, Allen JC, Tan TC. Prevalence of striae gravidarum in a multi-ethnic Asian population and the associated risk factors. Australas J Dermatol.2017;58(3):e154-e155.

3- Farahnik B, Park K, Kroumpouzos G, Murase J. Striae gravidarum: Risk factors, prevention, and management. Int J Womens Dermatol. 2016;3(2):77-85.

4- Ersoy E, Ersoy AO, Yasar Celik E, Tokmak A, Ozler S, Tasci Y. Is it possible to prevent striae gravidarum? J Chin Med Assoc. 2016;79(5):272-275.

5- Wang F, Calderone K, Smith NR, Do TT, Helfrich YR, Johnson TR, Kang S, Voorhees JJ, Fisher GJ. Marked disruption and aberrant regulation of elastic fibres in early striae gravidarum. Brit J Dermatol. 2015;173(6):1420-30.

6- Buţureanu SA, Buţureanu TA. Pathophysiology of adhesions. Chirurgia (Bucharest, Romania: 1990). 2014;109(3):293-8.

7- Catena F, Di Saverio S, Coccolini F, Ansaloni L, De Simone B, Sartelli M, Van Goor H. Adhesive small bowel adhesions obstruction: Evolutions in diagnosis, management and prevention. World j gastroint surg. 2016;8(3):222.

8- Dogan A, Ertas IE, Uyar I, Karaca I, Bozgeyik B, Töz E, Ozeren M. Preoperative association of abdominal striae gravidarum with intraabdominal adhesions in pregnant women with a history of previous cesarean section: a cross-sectional study. Geburtshilfe und Frauenheilkunde. 2016;76(3):268.

9- Celik EY, Ersoy AO, Ersoy E, Yoruk O, Tokmak A, Tasci Y. Is Striae Gravidarum related to Cesarean Scar and Peritoneal Adhesions?.

10- Hamilton BE, Martin JA, Sutton PD. Births: preliminary data for 2003. Natl Vital Stat Rep. 2004;53(9):1-17.

11- Betran AP, Merialdi M, Lauer JA, Bing- Shun W, Thomas J, Van Look P, etal. Rates of caesarean section: Analysis of global, regional and national estimates. Paediatr Perinat Epidemiol. 2007; 21(2):98-113.

12- Awonuga AO, Fletcher NM, Saed GM, Diamond MP. Postoperative adhesion development following cesarean and open intra-abdominal gynecological operations: a review. Reprod Sci. 2011;18(12):1166-85.

13- Dehghan F, Haerian BS, Muniandy S, Yusof A, Dragoo JL, Salleh N. The effect of relaxin on the musculoskeletal system. Scand J Med Sci Sports. 2014;24(4):e220-e229.

14- Lurie S, Matas Z, Fux A, Golan A, Sadan O. Association of serum relaxin with striae gravidarum in pregnant women. Arch Gynecol Obstet. 2011;283(2):219-22.

15- Brecht A, Bartsch C, Baumann G, Stangl K, Dschietzig T. Relaxin inhibits early steps in vascular inflammation. Regul Pept. 2011;166(1-3):76-82.

16- Cakir Gungor AN, Oguz S, Hacivelioglu S, Isik S, Uysal A, Gencer M, etal. Predictive value of striae gravidarum severity for intraperitoneal adhesions or uterine scar healing in patients with previous caesarean delivery. J Matern Fetal Neonatal Med. 2014;27(13):1312-1315.

17- Kahyaoglu I, Kayikcioglu F, Kinay T, Mollamahmutoglu L. Abdominal scar characteristics: Do they predict intra-abdominal adhesions with repeat cesarean deliveries?. J Obstet Gynaecol Res. 2014;40(6):1643-8.

18- Dogan NU, Haktankacmaz SA, Dogan S, Ozkan O, Celik H, Eryilmaz OG, Doganay M, Gulerman C. A reliable way to predict intraabdominal adhesions at repeat cesarean delivery: scar characteristics. Acta obstetricia et gynecologica Scandinavica. 2011;90(5):531-4.