Original Article

Striae: a risk factor for urogenital stopia?

Estrias: fator de risco para distopia urogenital?

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ABSTRACT

Background: Striae are linear atrophic plaques associated with overstretching the skin (commonly called stretch marks). Urogenital dystopia is the displacement of a pelvic organ from its original site due to alterations in or relaxation of the pelvic supporting structures. Histopathologic studies have revealed similarities in the irregularity of the distribution patterns of collagen fibers located in the striae's tissue and in the pelvic floor of patients suffering from pelvic relaxation or prolapse.
Objective: To evaluate the prevalence of striae in patients with and without pelvic relaxation syndrome, in order to assess the association between the two conditions.
Methods: Female patients with genital dystopia and healthy controls were administered an 80-question instrument specifically designed for this study and received a physical examination to determine whether there is a link between striae and genital dystopia.
Results: No statistically significant difference was observed in the prevalence of striae in patients with genital dystopia (n=35) compared with controls (n=94), suggesting there is no association between the two conditions.
Conclusion: The association between striae and genital dystopia, previously suggested by other authors, was not verified in this study. Since striae are not a risk factor for pelvic relaxation, it is necessary to investigate other clinical markers that will enable preventive measures and the reduction of costs associated with the surgical treatment of prolapse.
Keywords: skin; uterine prolapse; urinary incontinence; collagen.

RESUMO

Fundamento: *Estrias são placas lineares atróficas associadas a estiramento da pele. A distopia urogenital é o deslocamento de um órgão pélvico de seu sítio habitual devido a alterações de suas estruturas de sustentação. Há estudos histopatológicos que revelam igual distribuição irregular de fibras colágenas no tecido das estrias e do assoalho das pacientes com relaxamento pélvico.*
Objetivo: *Avaliar a prevalência de estrias em pacientes com e sem relaxamento pélvico, verificando se há a associação de risco entre elas.*
Método: *Foram estudadas pacientes, portadoras comprovadas de distopia genital e mulheres sadias. Todas foram submetidas a exame físico e aplicação de questionário com 80 perguntas elaboradas especificamente para essa pesquisa.*
Resultado: *Não foi verificada diferença estatística significativa na prevalência de estrias em pacientes com distopia urogenital (n=35) comparada com os controles (n=94), sugerindo ausência dessa associação.*
Conclusão: *A associação entre as duas condições, estrias e distopia genital, antes sugerida por outros autores, não foi demonstrada neste trabalho. Como implicação prática, provou-se que as estrias não constituem fator de risco para relaxamento pélvico, havendo necessidade de investigar outros marcadores clínicos capazes de possibilitar medidas preventivas e a redução dos gastos com o tratamento cirúrgico dos prolapsos.*
Palavras-chave: *pele; prolapso uterino; incontinência urinária; colágeno.*

INTRODUCTION

Striae are linear and atrophic plaques associated with the continuous and progressive distension of the skin [1,23]. They are a very common type of skin lesion that can cause important psychological consequences and the worsening of women's quality of life due to their unattractive appearance [4]. Their reported prevalence rates are 40% to 70% in the adolescent population [5] and 50% to 90% in pregnant women [5,6,7,8]. Regardless of the cause [14], striae always present the same clinical features, evolving through two stages: initially they assume the form of red or purplish lines, narrow or wide shaped, that become pale and atrophic with time [1,7,8]. Such lesions are predominantly located on the arms, hips, abdomen and lumbosacral region [2], occurring in other areas when linked to Cushing's Syndrome [9] or to the use of corticosteroids [10,11].

Striae may occur in a number of physiological and pathological conditions, for instance during pregnancy [7] and adolescent growth spurts [2,3,12], in obesity, in association with Cushing's [2,6,9] or Marfan [12] Syndromes, with diabetes mellitus [9], with hormonal alterations of the adrenal gland [9,12] and the prolonged use of topical corticosteroids [10,11]. Recent studies suggest a family or personal history of striae [13], more reliably predict whether a woman will develop striae during pregnancy than the amount of weight gained [6,14].

The etiology of striae is unknown [15]. Authors attribute their formation to both exogenous and endogenous factors; its pathogenesis involves alterations in the connective tissue [3,8]. In addition, they present reductions and modifications in the configuration of the elastic fibers, collagen, and fibrillin of the dermis [17]. Elastic and collagen fibers are produced by fibroblasts. A study aimed at comparing the contractility of normal skin to that with striae revealed that these lesions usually occur in the presence of specific characteristics of fibroblasts [3] that become inactive as in the dystopic tissues [4], which further strengthens the association of those two pathologies.

In the striae there is a lesion in the architecture of the network of elastic fibers below the dermoepidermal connection, while in normal skin there is a complex and continuous elastic system, stretching from the papillary dermis to the deep dermis [1].

These mentioned alterations have an important role in the pathogenesis of a cutaneous lesion [1]. Individuals who are predisposed to develop striae may have an inherent quantitative and/or qualitative collagen deficiency [1]. Studies of the extracellular matrix of the periurethral tissue of women with pelvic relaxation show that there is an irregular distribution of elastic fibers and collagen in the tissue [15,16], which is also observed in biopsies of skin affected by striae [1,8,17].

Current studies show that the prevalence of striae in women with uterine prolapse is twice that of women who do not suffer from this condition [17].

Urogenital dystopia is the partial or total displacement of a pelvic body from its usual site due to a weak pelvic supporting structure [17,18], which is formed by the pelvis and the pelvic floor fasciae and muscles [16]. Biomechanical and biochemical alterations in the composition or configuration of the pelvic floor lead to a – usually permanent – deficiency in those organs' supporting structures [18]. Depending on the severity of the dystopia, it becomes difficult to determine its real prevalence, due to its varied symptomatology [17,19]. It is estimated that it affects more than 30% of all patients who seek gynecological care, and more than 50% of gynecological patients over 50. Approximately 50% of women who have given birth suffer from some degree of prolapse; however, only 20% are symptomatic [20].

Genital prolapse is a condition of great social, economic, and psychological impact that affects millions of women around the world. It incurs significant healthcare costs and worsens the quality of life of the women affected by it, who may develop dysfunctions and even sexual incapacity [17,19,20,21,22]. Similar to striae, genital prolapse is a complex condition of unknown etiology [17]. There are several predisposing factors, including pregnancy, vaginal childbirths, laborious and/or slow childbirths and abortions, advanced age, variation in the skeletal structure, neuromuscular impairment [16, 23], congenital factors, genetic and racial factors, and illnesses of the connective tissue [19,21, 24]. Other factors may aggravate the condition, such as obstructive pulmonary illnesses, estrogen deficiency, chronic constipation [19,24,25], malnutrition, occupation and sportive activities, tobacco use, and previous pelvic surgeries (1924). Women who suffer from connective tissue illnesses, like Marfan or Ehlers-Danlos Syndromes, present high rates of genital prolapse (33% and 75% respectively)[19,26].

The connective tissue of the pelvic floor is formed by collagen and elastic fibers [18,19, 24]. The collagen is firm and strong, lending resistance to the tissue, whereas the elastin allows it to stretch and return to its normal shape [19]. In cases of genital dystopia, elastic fibers are fragmented and distributed unevenly [15]. Several studies have revealed that dystopia causes a decrease in the amount, solubility and expression of collagen, and increases the degradation and alteration rates of its metabolism in the pelvic floor [19, 24]. Studies have also shown that patients with genital dystopia had a reduction in collagen levels in organs with distension capacity, including the skin, lungs [15], and abdominal wall and thighs [24,27], in addition to the fasciae and ligaments of the pelvic floor. Such studies have therefore indicated that alterations in the connective tissue

extracellular matrix of those two conditions would have a key role in the pathobiology of the striae and pelvic relaxation (4), suggesting that additional research should examine that association.

This subject was properly highlighted in an article by Salter et al [17] in the Journal of Investigative Dermatology (2006), who studied 116 patients and concluded that 54.7% of women with uterine prolapse have striae – twice as much as women without prolapse (25%). This strong association suggests that striae can be a risk factor for the development of urogenital dystopia, on top of already known risk factors such as weight, age, corticosteroid use, number of pregnancies, menopause, prior pelvic surgery, tobacco use, level of physical activity and chronic illnesses [17].

Diagnosing women with pelvic relaxation during the asymptomatic phase is key to allow a conservative clinical

conduct. The functional evaluation of the pelvic floor has a decisive role in the physiotherapeutic treatment of its dysfunctions [28]. In this manner, it is possible to avoid the progression of the condition to the point of genital prolapse or urinary incontinence, which would demand a surgical approach.

The objective of this study is to verify whether patients with urogenital dystopia present a higher rate of striae than women without dystopia and thus to infer the possible risk association between these two conditions.

METHODS

This investigative study involved administering a questionnaire with 80 questions specifically elaborated, as well as a physical examination.

The higher relevance data will be shown in tables. The association between the investigated variables and the diagnosis of the two pathological conditions (striae and dystopias) will be analyzed by the statistics team of the Medical School of the University of the Municipality of Jundiaí using the chi-square test and odds ratios, with a confidence interval of 95%

RESULTS

The study evaluated 129 female patients: 35 had previously been diagnosed with genital dystopia and/or had received surgery to correct urogenital dystopia at the Jundiaí Municipality Health Secretary's Women's Health Clinic in 2006; patients with no previous dystopia diagnosis from the

Dermatology Clinic of the Medical School of the University of the Municipality of Jundiaí (n=94) served as a control group. Most patients in the two groups were aged between 40 and 50 (Table 1).

Of the women interviewed (including controls and the dystopia group), 65.9% presented with striae. In the group with dystopia, 24 patients (68.6%) presented the cutaneous alteration, while that number was of 61 (64.9%) in the control group (Table 2).

A body mass index (BMI) over 30, a great variation in weight over a period of more than five years, complaints of cutaneous flaccidity and sedentarism were shown to be risk factors for dystopia (Table 3). Additionally, going through more than three gestations or three normal childbirths was also associated with pelvic prolapse (Table 4).

Most of the patients with striae (82.4%) presented with whitish lesions (Table 2).

DISCUSSION

A German study published in 2003 [18] compared the composition and types of collagen in the pelvic floor of patients with and without urinary incontinence. This study revealed that the conjunctive tissue of the pelvic floor of women with urogenital dystopia showed a significant reduction of type I, III and VI collagen, in addition to the fragmentation or absence of glycoproteins, when compared to women without incontinence complaints or urogenital dystopia [18, 29]. In addition to the decrease in the number of collagen fibers, Chinese researchers [30] have found an increase in the diameter of such fibers, causing them to become less elastic and develop a higher propensity to break. These alterations are also present in the extracellular matrix of skin with striae [1]. In this manner, there are references

Table 1 - Ages of patients per group studied

	Group				OR (IC 95%)			
	test		control					
	N.	%	N.	%				
age								
40 to 50	13	(37,1)	62	(66,0)	1,00			
40 to 50	11	(31,4)	16	(17,0)	3,28	(1,24	to	8,68)
60 to 70	7	(20,0)	10	(10,6)	**3,34**	**(1,07**	to	**10,40)**
Over 70	4	(11,4)	6	(6,4)	3,18	(0,78	to	12,88)

Table 2 - Presence and characteristics of estriae in the groups with and without dystopia

	Group				OR (IC 95%)			
	Test		Control					
	N.	%	N.	%				
Estriae								
No	11	(31,4)	33	(35,1)	1,00			
Yes	24	(68,6)	61	(64,9)	1,18	(0,51	to	2,71)
Color								
Red/purplish	4	(16,7)	8	(13,1)	1,00			
Red/purplish and pale	1	(4,2)	2	(3,3)	1,00	(0,07	to	14,64)
pale	19	(79,2)	51	(83,6)	0,75	(0,20	to	2,76)

Table 3 - Weight, body mass index (BMI) and antecedents per group

	Group				OR (IC 95%)	
	Test		Control			
	N.	%	N.	%		
BMI						
n.a.	1		1			
< 25	9	(26,5)	46	(49,5)	1,00	
25.1 to 30	14	(41,2)	29	(31,2)	2,47	(0,95 to 6,43)
> 30	11	(32,4)	18	(19,4)	**3,12**	**(1,11 to 8,80)**
Fast change in weight						
Yes, in the last 2 years	5	(14,3)	30	(31,9)		
Yes, in the last 5 years	9	(25,7)	19	(20,2)	1,68	(0,57 to 4,98)
Yes, more than 5 years ago	12	(34,3)	13	(13,8)	**3,28**	**(1,12 to 9,65)**
No	9	(25,7)	32	(34,0)	1,00	
Does the facial skin present more wrinkles or is flaccid?						
n.a.	0		1			
Yes, more than average for my age	17	(48,6)	23	(24,7)	**2,87**	**(1,27 to 6,48)**
No, nothing beyond expectations for my age	18	(51,4)	70	(75,3)	1,00	
Do you exercise?						
Yes, 3 times or more per week	5	(14,3)	27	(38,6)	1,00	
Yes, between 1 and 3 times per week	7	(20,0)	16	(22,9)	2,36	(0,64 to 8,70)
No	23	(65,7)	27	(38,6)	**4,60**	**(1,52 to 13,88)**

Table 4 - Gynecologic characteristics per group when kept in the initial conditions and when subjected to 45ºC for 7, 14, 21 e 28 days

	Group				OR (IC 95%)	
	Test		Control			
	N.	%	N.	%		
Number of pregnancies						
n.a.	1		32			
1 to 2	6	(17,6)	30	(48,4)	1,00	
3 or more	28	(82,4)	32	(51,6)	**4,38**	**(1,59 to 12,04)**
Number of normal childbirths						
n.a.	6		55			
1 to 2	10	(34,5)	25	(64,1)	1,00	
3 or more	19	(65,5)	14	(35,9)	**3,39**	**(1,24 to 9,29)**

in the literature that associate striae to pelvic relaxation [4, 17]. Notwithstanding, in this study we did not observe a higher prevalence of striae in women with dystopia. Although that prevalence is high (68.6%), the rate was also high in the control group (64.9%).

The absence of this association in the current research differs from previous studies [4, 17], which could be attributed to diverse external factors such as environment, race, diet, and socioeconomic and cultural factors, which are different for the studied populations. Aside from that, a recent article [7] criticized Salter's study [17] for relying on answers given in patient questionnaires rather than conducting physical examinations. In contrast, the present study objectively analyzed the striae during physical examinations of the patients.

The relevance of the subject and the results that are contrary to those of previous studies demonstrate the need for further investigation in order to define the value of the striae as a predictive clinical marker of genital dystopia.

CONCLUSION

The histopathologic similarity between striae and urogenital dystopia leads to an etiologic association between them, since both show alterations of the collagen fibers of the connective tissue. Nevertheless, the results of this study suggest that striae cannot be considered a risk factor for urogenital dystopia.

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