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REDUCED TYPE I COLLAGEN OF VAGINAL TISSUE IN WOMEN WITH SYMPTOMATIC ANTERIOR VAGINAL COMPARTMENT PROLAPSE (CYSTOCOELE): A CAUSE OR A RESULT OF WORSENING PROLAPSE?

Hypothesis / aims of study

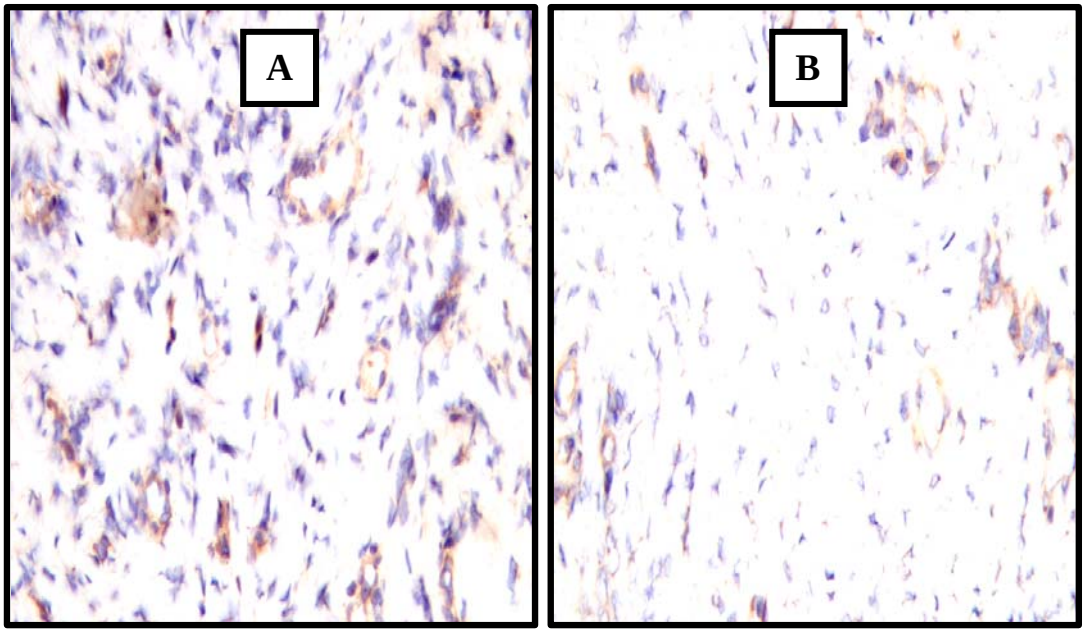
Women with symptomatic pelvic organ prolapse (POP) have reduced Type I Collagen and increased collageneolytic activity in their vaginal tissue (1). However, the reason for an altered collagen metabolism in these women remains unclear (2). It is uncertain whether these changes are the cause of POP, or a consequence of remodelling and increased degradation of collagen resulting from biomechanical stressing of vaginal tissue by pelvic organ descent. In this study we investigated the relationship between anterior vaginal wall epithelial tissue collagen content and worsening POP.

Study design, materials and methods

Fifty-nine symptomatic women (mean age = 62 years, median parity = 2, ICS POP-Q stage = 2, and point Aa = +1) taking part in a prospective study designed to investigate the outcome of prolapse surgery were investigated. Anterior vaginal wall tissue samples obtained from a site approximately 3cm above the hymen (i.e. ICS POP-Q point Aa) were immediately frozen in liquid Nitrogen and stored in a – 40 C freezer. Immuno-histochemistry was performed to determine the tissue content of Pro-collagen I, Collagen Types I, III and V, and, Matrix Metalloproteinase (MMP) 1 and 2.

Results

In comparison to women with more severe POP, women with ICS POP-Q point Aa/Ba <+1cm (Anterior vaginal wall POP-Q grades ≤ 2) had significantly more vaginal tissue content of Collagen Type I and MMP 1 (Mann-Whitney test p-value = 0.0108 and 0.0125 respectively), and there was moderate but significant negative correlation between increasing anterior vaginal wall descent (Point Aa), and vaginal tissue content of Collagen Type I and MMP 2 (rs = -0.284, 95% CI: -0.505 to -0.028) and - 0.317, 95% CI: -0.535 to -0.059, p= 0.031 and 0.017 respectively). There was no difference or correlation with Pro-collagen, Collagen Types III and V and MMP 1. The images below illustrate varying collagen Type I content in the vaginal tissues of two 56 year old women with POP-Q point Aa = +1 cm (A) and



+3 cm (B).

Interpretation of results

Whilst differences in vaginal tissue collagen content and metabolism play a recognised role in the occurrence of female pelvic organ prolapse, it appears that the reduction of the main structural protein – Collagen Type I seen in these women is related to increasing severity of POP, which occurs as a result of degradation of mature Collagen Type I fibres by mechanical stressing of vaginal tissue during POP descent. The lack of correlation between vaginal wall decent and Pro-collagen I content supports the view that the underlying reason is increased degradation of mature Collagen Type I rather than reduced synthesis.

Concluding message

Reduction in vaginal tissue Collagen Type I in women with POP appears to be an effect of worsening vaginal wall descent.

References

1. Lancet. 1996 Jun 15;347(9016):1658-61.
2. BJOG. 2006 Jan;113(1):39-46.

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