72

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CHANGES OF TYPE III AND I COLLAGEN IN PERIURETHRAL CONNECTIVE TISSUE OF KOREAN WOMEN WITH STRESS URINARY INCONTINENCE.

Hypothesis / aims of study

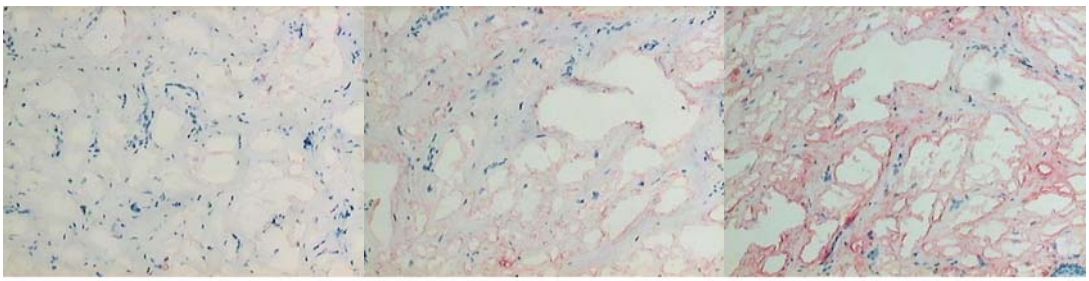
This study was to determine possible changes in the quantity of type III and I collagen in periurethral connective tissue of Korean women with stress urinary incontinence (SUI).

Study design, materials and methods

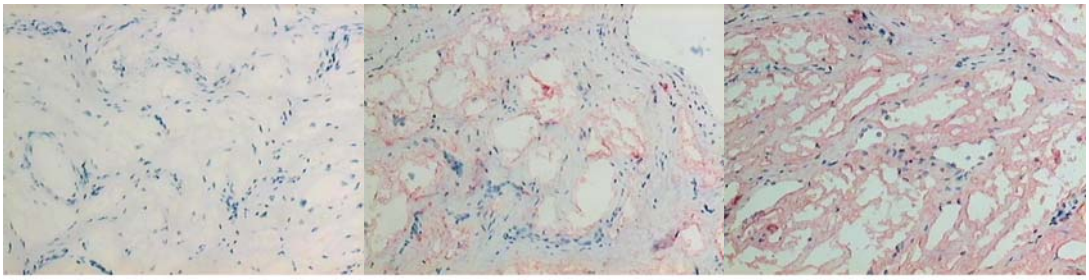
Sixty-nine women participated in the study and they were divided into two groups. 35 patients were incontinent and 34 patients were continent. They were comparable with respect to age and parity. All the women underwent a complete pre-operative urodynamic evaluation, and they were done gynaecologic surgical procedures and biopsies from periurethral connective tissue. The presence of collagen type III and I was determined by immunohistochemical technique. All tissues were then sectioned at 10 microns in a cryostat. Sections were incubated with mouse monoclonal IgG antibodies directed against type III and I collagens (Abcam Ltd, Cambridge, UK) with 1:2000 dilution. They were studied quantitative analysis of staining was analysed with help of two pathologist. The student *t*-test and Pearson correlation coefficient were used for statistical analysis. A $p<0.05$ was considered statistically significant.

Results

The stain reactions were divided negative (-, A and D), positive (+, B and E), strong positive (++, C and F) (figure). In continent group, stain reaction was 21.4% of negative, 23.3% of positive, 55.3% of strong positive in type I collagen and 22%, 36%, 42% in type III. But in incontinent group, it was 52%, 34.1%, 13.6% in type I and 40.9%, 36.4%, 22.7% in type III. Compared with the continent women, the tissue samples of the incontinent women showed a significantly weaker immunohistochemical staining of collagen type III and I ($p<0.05$). Both collagen types III and I were marked reduced in the patient of grade III, intrinsic sphincter deficiency (ISD) type stress urinary incontinence (table). However there was no significant relation between quantity of collagen and other etiologic factors including age, parity, grade, and menopausal.



A B C



D E F

Figure: Microscopic appearance of stain reaction for collagen type I (A, B, C) & III (D, E, F)(x400). The collagen stained bright red.

	Continent			G I			G II			G III		
Stain	-	+	++	-	+	++	-	+	++	-	+	++
I	21.4	23.3	55.3	54.5	27.3	18.2	48.0	40.0	12.0	62.5	25.0	12.5
III	22	36	42	36.4	54.5	9.1	36.0	32.0	32.0	62.5	25.0	12.5

Table: % Of specimen as Immunohistochemistry stain density according to SUI grade.

Interpretation of results

Connective tissue consists mainly of collagen and structural glycoproteins and is considered an important factor of the supportive structures of the genitourinary region. Compared with the continent women, the tissue samples of the incontinent women showed a significantly weaker immunohistochemical staining of type III and I collagen, especially ISD. Our results indicate an altered metabolism of connective tissue in the periurethral region with a significant decrease of collagen type III and I in incontinent women.

Concluding message

In this study, Korean women with SUI had less collagen type III and I in periurethra connective tissue regardless of the degree of pelvic relaxation, parity, menopausal, age. But grade III (ISD) SUI was significantly decreased in collagen type III and I. It appears that collagen has a significant role in the maintenance of urinary continence.