

MORPHOMETRIC ANALYSIS OF THE SMOOTH MUSCLE AND NERVE FIBERS OF THE ANTERIOR VAGINAL WALL IN WOMEN WITH AND WITHOUT PELVIC ORGANE PROLAPSE

Hypothesis / aims of study

The aim of this study was to compare the changes in hystomorphometry and innervation of the anterior vaginal wall in women with anterior vaginal wall prolapse and women with normal genital support.

Study design, materials and methods

Eighty-nine biopsy specimens were obtained from the anterior vaginal wall epithelium of women having a large cystocele repaired (stage \geq II; prolapse group, 49) and the same location in patients with no prolapse (stage $<$ II; control group, 40). Routine HE staining and immunohistochemical staining for protein gene product 9.5 (PGP9.5) and smooth muscle α -actin were performed for all specimens. PGP9.5 immunostaining was identified in nerve fibers and cells of the epithelium and subepithelial connective tissue of vagina. Morphometric analysis was used to determine the fractional area of nonvascular smooth muscle in the muscularis in histologic cross-sections of the anterior vaginal wall.

Results

The mean \pm SEM number and diameter of the submucosal nerve fibers were significantly lower in women with prolapse than in control subjects (3.82 ± 0.4 vs. 7.42 ± 3.4 , $p = 0.000$; 37.14 ± 12.3 vs. 53.75 ± 16.1 , $p = 0.000$, respectively). Mean submucosal distance to the muscularis lamina in prolapsed women was significantly higher than in women with normal anterior vaginal support. According to partial correlation of the demographic risk factors (age, BMI, parity, vaginal delivery, postmenopausal period) with the histologic parameters, we found that there was a negative correlation between the vaginal delivery and the nerve number and diameter measurements, and positive correlation between the vaginal delivery and submucosal distance of muscular level.

Interpretation of results

In this case-control study investigating smooth muscle and nerve fiber changes in women with prolapse, number and diameter of the nerves were significantly lower, submucosal distance to muscular region was significantly higher in the vaginal wall of patients with a large cystocele than in controls.

Concluding message

These results indicates that women with a large cystocele have a significantly lower total innervation of the anterior vaginal epithelium than control, and vaginal delivery is the most important risk factor of decreasing vaginal innervation. However, we do not know that the changes in vaginal tissue is a result or a cause of prolapse.

Specify source of funding or grant	We thank to Trakya University Medical Research Unit for funding our study
Is this a clinical trial?	Yes
Is this study registered in a public clinical trials registry?	Yes
Specify Name of Public Registry, Registration Number	TUBAP-800
What were the subjects in the study?	HUMAN
Was this study approved by an ethics committee?	Yes
Specify Name of Ethics Committee	Trakya University Ethics Committe
Was the Declaration of Helsinki followed?	Yes
Was informed consent obtained from the patients?	Yes