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IN VITRO CONTRACTILE PROPERTIES OF ANTERIOR VAGINAL WALL (AVW) IN POSTMENOPAUSAL WOMEN

Hypothesis / aims of study

To test the hypothesis that stretched anterior vaginal wall tissue from advanced prolapse has decreased contractility compared to control tissue of similar age group

Study design, materials and methods

After IRB approval, 12 AVW specimens were obtained from postmenopausal Caucasian women, 7 during cystocele repair (stage III-IV) and 5 during radical cystectomy in patients with no prolapse. Tissue bath study was performed within 2 hours of tissue harvesting. All AVW samples were cut from the harvested tissue to obtain the same size and configuration. Then one longitudinal and one transverse strip were obtained from each tissue sample. After pre-stretch at 1 gm followed by a rest period of 1 hour, strips were stimulated with increasing doses of carbachol (range: 10e6M-10e1M), then potassium (80mM), and finally electrically stimulated at 14.5 volts, at frequencies from 2 to 160 Hz using an advanced interface of LabVIEW 5.0 software (setting stimulation parameters) with a Grass stimulator. Contractility measurements as well as peak response, time to peak response, and time to return to baseline were calculated. The tester was blinded to the tissue origin. Using SPSS 11.5 non-parametric t-test and multiple comparison tests were performed.

Results

Average patient age was 66 for the prolapse group and 68 for the control. In 24 strips tested, peak response of prolapsed tissues was significantly lower than in the controls for both the carbachol ($p = 0.025$) and electrical stimulation ($p= 0.0198$) for virtually all stimulation parameters. Maximal force of contraction was observed at 10e3M (Control 0.284 g ± 0.042: Prolapse 0.257 g ± 0.050) and at 160Hz (Control 0.306 g ± 0.016: Prolapse 0.255 g ± 0.020). There was no significant difference in contractility based on tissue orientation ($p = 0.79$), and no difference in time to peak or time to baseline between groups ($p = 0.89$).

Interpretation of results

Prolapsed AVW of postmenopausal caucasian women is less contractile than age-matched controls with no prolapse, suggesting irreversible deformation resulting in, or possibly due to the effect of prolapse over time.

Concluding message

Advanced pelvic organ prolpase affects the contractile properties of vaginal smooth muscle.