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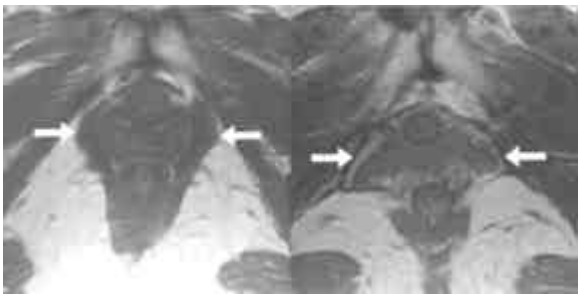
PUBOCOCCYGEAL MUSCLE INTEGRITY AND URETHRAL CLOSURE PRESSURES DURING VOLITIONAL PELVIC FLOOR MUSCLE CONTRACTION IN WOMEN WITHOUT STRESS INCONTINENCE OR PELVIC ORGAN PROLAPSE

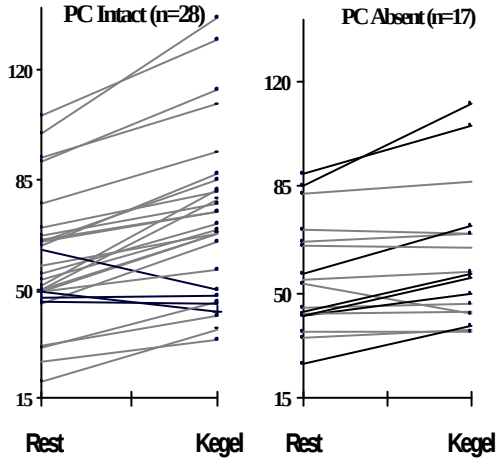
Aims of the study

An increase of urethral closure pressure during volitional pelvic floor muscle contraction could arise from activity of the striated urogenital sphincter, the pubococcygeal portion of the levator ani muscle, or both. This study was undertaken to determine the degree to which complete loss of the pubococcygeal muscle affected women's ability to volitionally augment their urethral closure pressures by using a volitional pelvic floor muscle contraction ("Kegel effort").

Methods

The sample consisted of a subset of women who volunteered as healthy controls in a larger IRB-approved study. They were free of urinary leakage or prolapse and had a negative stress test. Multiplanar proton density MR images of the pelvis were obtained in all women. A trained observer evaluated each scan to determine pubococcygeal muscle status. Women were selected for analysis if they demonstrated either intact puboccygeus muscle (n=28, mean age: 54 years) or absent pubococcygeal muscle (n=17, mean age: 59 years). Women with partial defects (e.g. one-sided only) were excluded. The Figure shows example MRI scans portraying intact (left picture) and absent (right picture) pubococcygeal muscles. Urethral pressures were obtained in cm H_2O using an 8 Fr. Microtip transducer (Gaeltec™, Medical Measurements Inc., Hackensack, NJ, USA). Maximal urethral closure pressures (MUCP) were measured with women at rest while the catheter was pulled through the urethra. Women were then asked to perform two to three Kegel efforts while the transducer was held at the point of MUCP. Outcome variables were the mean changes in individual's urethral closure pressures produced by the Kegel efforts and the percentage of women in each group who were able to increase their MUCP by more than 5 cm H_2O. Group comparisons were made using descriptive statistics and Student's T-test.





Results

Differences between groups regarding age or resting MUCP were not statistically different. In the graph at right each woman's pressure at rest and during pelvic floor muscle contraction (Kegel) are shown connected by a line. Some women in both groups were able to increase urethral closure pressure from the resting value by using a Kegel effort. Women without pubococcygeal muscles ("PC Absent") were about half as likely

	PC Intact	PC Absent
Pressure Increase > 5 cm H_2O	86%	41%
Mean MUCP (SD)	58 (21)	55 (19)
Mean Pressure Rise (SD)	14 (11)	6 (9)

to be able to increase pressure by more than 5 cm H_2O (see table). Moreover, their mean pressure increases were 43% lower than in women with intact muscles (p = .015).

Conclusion

Women with an absent pubococcygeal muscle are only half as likely to be able to increase their urethral closure pressure more than 5 cm H_2O and generate 43% less pressure with pelvic muscle contraction as women with normal women. Comment: The increase in urethral closure pressure in women without pubococcygeal muscle would be primarily attributable to the urogenital sphincter.

We gratefully acknowledge NIH support: R01 NICHD 01-38665-03.