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## ASSOCIATION OF THE BRINK DIGITAL PELVIC MUSCLE SCORE WITH DEMOGRAPHIC AND CLINICAL CHARACTERISTICS IN WOMEN SCHEDULED TO UNDERGO ANTI-INCONTINENCE SURGERY

### Hypothesis / aims of study

To determine whether digital assessment of pelvic muscle strength as rated by the Brink system is associated with patient characteristics and measures of urinary incontinence symptom severity in women with stress incontinence scheduled to undergo surgery as part of a randomized clinical trial comparing the Burch and suburethral sling procedures.

### Study design, materials and methods

Baseline data from patients enrolled in the Stress Incontinence Surgical Treatment Efficacy (SISTEr) trial were included in this analysis. At baseline, pelvic floor strength is assessed by digital palpation and rated according to the Brinks scale [1]. This scale is based upon 3 muscle contraction variables: pressure or muscle force, vertical displacement of the examiners fingers during contraction of the muscles lateral to the vagina, and duration of muscle contraction. Each muscle contraction variable is rated on a 4-point ordinal scale (ranging from 1 to 4), and the three subscale scores are summed to obtain a composite pelvic muscle strength score. The range of possible scores is thus 3 to 12.
Patient demographic variables considered were age, race, parity and history of prior incontinence surgery, and stage of pelvic organ prolapse according to the POPQ system. Severity of urinary incontinence symptoms was measured by the Medical, Epidemiological, Sociological and Epidemiological Aspects of Aging (MESA) questionnaire and by standardized pad-weight testing.
Descriptive statistics were tabulated for all variables. Wilcoxon rank-sum and Kruskal-Wallis tests were conducted to determine whether the Brink score differed significantly by each categorical independent variable. Associations between the continuous independent variables and the Brink score were measured using Spearman rank order correlations.

### Results

As of 2/18/04, there were 555 randomized patients in the UITN SISTEr trial. Nine patients who were missing one or more of the Brink score component variables (i.e. pressure, duration, or displacement of vertical plane) were excluded from this analysis, yielding a total sample size of 546.
The sample was predominantly white (82%). Eleven percent reported being Hispanic/Latina. Nearly 15% had undergone surgery for urinary incontinence (UI) previously. The majority (60%) of the women were POP-Q stage 2 at baseline.
Although absolute differences were small, the Brink score differed significantly by race (p=0.01), with the mean Brink score for African-American women being the highest (Table 1). There was no significant difference in Brink score between Hispanic and non-Hispanic women, nor between women who did and did not have previous UI surgery.

| Race | Number (%) | Brink score Mean (Std Dev) | Range |
|---|---|---|---|
| African American | 33 (6%) | 9.7 (1.6) | 6-12 |
| Caucasian | 430 (82%) | 9.0 (2.2) | 3-12 |
| Other/Multiple | 64 (12%) | 8.5 (2.1) | 3-12 |
| | | | |
| Hispanic | 61 (11%) | 8.9 (1.9) | 3-12 |
| Non-Hispanic | 485 (89%) | 9.0 (2.1) | 3-12 |

There was a small but statistically significant difference in Brink score when patients were compared by POP-Q stage (p=0.03).

| POPQ stage | Frequency (%) | Brink score Mean (Std.Dev) | Range |
|---|---|---|---|
| 0 | 28 (5%) | 9.5 (2.7) | 3-12 |
| 1 | 96 (18%) | 9.4 (1.9) | 3-12 |
| 2 | 329 (60%) | 8.9 (2.0) | 3-12 |
| 3 | 73 (13%) | 8.7 (2.2) | 3-12 |
| 4 | 19 (3%) | 8.3 (2.8) | 3-12 |

The magnitude of the correlations between Brink score and the continuous independent variables were all small, but statistically significant in the case of correlations with age (r= -0.12, p=0.006), number of vaginal deliveries (r=-0.11, p=0.01), and stage (r=-0.13, p=0.002). Importantly, Brink score did not correlate with clinical measures of incontinence severity including MESA scores (r=-0.03, p=0.42) and pad weights (r=-0.05, p=0.27).

**Interpretation of results**

Overall, Brink scores were high in this cohort of incontinent patients. Although increasing age, parity, and stage were significantly associated with decreasing Brink scores, the correlations were fairly small. The finding that Brink scores did not correlate with clinical measures of incontinence severity suggests that the scale may be relatively insensitive to clinically important differences.

**Concluding message**

The Brink score is easily understood and obtained in the clinical setting. Brink scores varied with age, race and prolapse stage. This analysis did not show a association between Brink scores and clinical urinary incontinence severity measures.

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