Pelvic Physical Therapy Distance Journal Club
January 5, 2022
Beth Shelly

Reliability, validity and responsiveness of pelvic floor muscle surface electromyography and manometry. Braekken IH, Stuge B, Tveter AT, et al. Int Urogynecol J 2021; 32:3267-3274. Doi:10.1007/s00192-021-04881-0.

Introduction

- Evidence based medicine strives to assess PFM function with valid and reliable tools
- Manometry has been found to be more reliable than vaginal palpation to measure strength
- Vaginal probes are considered more specific the external patch electrodes (and less specific than intramuscular)
- More and more studies are being conducted on reliability and reproducibility of sEMG for PFM function
- sEMG measures active tone, Manometry measures both active and passive tone

Participants - 18+ yo, who are seeking treatment by pelvic PT and can contraction the PFM as assessed by intra vaginal methods (without UTI)

Assessment of correct PFM contraction - visual observation or vaginal palpation of inward lift

PFM assessment by investigations (ie instrument or device)
sEMG - tested twice at baseline (reliability) - not traversable to assessment done on different days

- Supine
- Vaginal *active* resting tone - overall average microvolts before and during 2 min rest between contraction
- Maximum voluntary contraction (MVC) - average peak activation during 10 second hold
- Endurance - 3 attempts of 10 second hold - overall average microvolts during mean muscle activation
- Excludes the first second of work and rest
- Other instrumentation included in the article - how does this compare to Prometheus

Manometry - calculated similar

Intratester Reliability (the same person testing)

- Very good for all measures
- Measurement error higher for MVC - 24% compared to endurance at 7.5% (no norms but 24% seems high)

Validity (correlation between manometry and EMG)

	Manometry	EMG	correlation
Resting tone	29.4	7.2 +/- 3.7	Moderate r=0.42
MVC	23.2	91.7+/- 68.1	Strong r=0.66
Endurance	165	31.6 +/- 19.9	Strong r=0.67

Cannot compare to our machine
Moderate to strong correlation with manometry
Largest discrepancy was found in women with very strong PFM
comparison manometry MVC and sEMG endurance - strong r=0.64 (interesting comparison)

Responsiveness - retest after 4 to 24 weeks of PFMT

- Manometry - significant increase PFM strength (MVC?) and endurance
- sEMG - not responsive to changes in MVC or endurance - muscle hypertrophy is not reflected in sEMG
- sEMG - significant decrease in resting tone

User perception

- 5 out of 66 preferred softer manometry probe
- about half preferred sEMG display

Conclusion in regard to sEMG

- Intratester reliability is very good if you do not take the probe out
- Moderate to strong correlation with manometry
- Resting tone
    - sEMG does demonstrate changes in decreased resting tone after PFMT
- MVC
    - 24% error indicating it is more prone to artifact and is a less reliable measure than resting tone and endurance
    - sEMG does not responsive to change of MVC in PFMT
- Endurance
    - ICC best for sEMG endurance
    - sEMG does not responsive to change of endurance in PFMT

Page 3272 describes change seen in PFM after PFMT (strength, muscle thickness, narrowing of hiatus, elevation of bladder)

Discussion questions

1. How often are you using vaginal / rectal probe?
2. Do you see a change in 10 second hold after PFMT? (patch vs probe)
3. What is your standard sEMG assessment protocol?