DIASTASIS RECTI ABDOMINIS
AND THE ABDOMINAL WALL:
CONSIDERATIONS FOR THE
CHILDBEARING YEAR

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DIASTASIS RECTI ABDOMINIS

Defined

• Literature is conflicted: It has been defined as separation of the Recti bellies at the linea alba when the Inter Recti Distance (IRD) is:
  • >1.5 cm (Gilleard and Brown, 1996)
  • >2 cm (Lo et al., 1999)
  • >2.5 cm (Candido et al., 2005)
  • >2 finger widths during a partial sit-up (Bursch, 1987; Sheppard, 1996)

(Coldron, 2008)

Normal IRD

• Dependent on a # of factors:
  • Gender (males exhibit > IRD than nulliparous women above umbilicus, though not below umbilicus)
  • Parity (parous women > IRD than nulliparous women)
  • Measurement tool (US, caliper, fingers)
  • Location along the linea alba (IRD > above umbilicus than below)
  • Trunk at rest or actively flexed

(Coldron 2008, Chiarello 2013)

Does DRA Resolve Spontaneously?

• Liaw (2011): Study of a cohort of 40 pp women implies, “yes”

• But, we know not all DRA resolves: Raney found 1/3 of women undergoing hysterectomy had mild → severe DRA

(Raney 1990, Spitznagel 2007)

Incidence/Prevalence of DRA

• Candido 2005: 35% immediate pp
• Boissonnault 1987: 66% of 3rd trimester women in a cross-sectional study. Bell shaped curve. Finger measurement; cross-sectional
Location of DRA

- Rett 2009
  - The prevalence of DRA and mean DRA were > above the umbilicus both among multiparae and primiparae.
  - Below the umbilicus, the mean DRA was > among multiparae (finger measurement)
- Boissonnault and Blaschak (1998): greatest incidence @ umbilicus

Changes to the abdominal wall in pregnancy

- Coldron 2008: US study showed ↑ IRD & thinner, wider, longer RA, compared to nullip controls, with gradual reduction in IRD @ 8wks pp, though incomplete resolution
- Gilhead & Brown 1996: those with DRA may have a ↓ capacity for force generation; subjects with a DRA of >35mm (1.38 In.) ↓ success performing a pelvic tilt or a trunk curl than those without DRA
- Liaw et al 2011: women @ 6 mos pp > IRD values and ↓ abdominal function compared to nullips & ↑ IRD correlated with ↓ abdominal function

Assessment

- Fingertip Measurement
- Caliper Measurement
- Ultrasound imaging (USI)

Assessment-fingers

- Finger Measurement
  - Technique: Place fingertips horizontally across abdomen @umbilicus, above and below
  - Ask client to perform a modified curl-up, keeping inferior angle of scapula on the table
  - Place fingers into the gap; feel for the medial borders of each rectus belly and insert fingers to fill the gap
  - Number of fingers in the gap determines the “fingertip measurement”
- Chiarello and McAulley (CSM 2014): concern of finger placement And, inter-rater reliability

DRA Measurement: Caliper Technique

Caliper

- Method
  - Hook-lying
  - Mark location along LA
  - Water soluble pen
  - Tape measure
  - Palpate medial borders of RA

Validiy of US measurements

- Mendes 2007: USI valid compared to measurements during surgery for DRA at and above umbilicus but not below
DRA Measurement: Caliper Technique

- **Method**
  - Mark measurement positions
  - Palpate medial borders of RA
  - Position inside caliper jaw between muscle belly at palpating finger perpendicular to the surface
  - Adjust caliper to perceived IRD width
- **Condition**
  - Passive - Muscles at rest
  - Active - Partial curl-up

Clinical Relevance
- Inexpensive, valid and reliable tool in the hands of a trained clinician
- Calipers may measure IRD width larger than direct measurement or imaging, particularly below the umbilicus
- Allows for documentation of change
- Preferable to finger-tip width when imaging is not available.

Reliability
- Dial Calipers
  - High Intra and Inter-rater at rest & active (ICC .90-.95) (Boyer & Jones, 1997; Hitchman et al., 1997)
- Digital Calipers
  - High Intra-rater with muscles contracting and at rest (ICC .94-.89) (Chiarello McAuley, 2013)
  - High Inter-rater (ICC .87) (Chiarello et al. 2005)

Validity
- Concurrent validity of calipers compared to USI (Chiarello McAuley, 2013)
  - Good above the umbilicus with muscles contracting and at rest (ICC .71-.79)
  - Below the umbilicus calipers measured IRD significantly larger than USI with muscles at rest and contracted

Etiology/Risk factors
- Candido 2005: Immediate pp women (35% [76/208] with DRA)
  - Performing childcare during pregnancy as a predictive risk factor for DRA
  - Vigorous ex and moderate walking was protective

Treatment: Strengthening. But How?
- Noble (2003): head lift with exhalation (and hand-crossing to bring two sides of rectus together)
- Some have advocated for addition of a sheet to pull the two sides together; though not scientifically studied

Lo, 1999:
- Multiparity
- Maternal age (>34 years)
- Larger babies
- Greater weight gain
- Caesarean section
- Multiple gestation

(though major limitations in this study)
Treatment, cont.
Transversus Abdominis
- TRa training
  - Ciolfi 2004: Case study pp.
  - DRA did not close, but pain and swelling were reduced
  - Chiarello 2005: 18 pregnant women; 8 exercised and 10 did not.
    - ↑ incidence of DRA (per caliper measurement) in non-exercisers (30% vs. 12.5%).
    - Ex focused on TRa and obliques (note small convenience sample, not randomized or blinded)
  - TRa and RA: See table from Keeler, 2012 on next slide
  - Litos, 2014: Case study using deep local mm (TRa, PF, multifidi) and progressed to strengthening global hip and trunk mm. Successful closure of 11 cm DRA

Bottom Line: we don’t know which Rx is best

Treatment, cont.
Corsets
Corsets have been proposed, but not scientifically studied (Collie 2004, Keeler 2012)

Some therapists advocate for usage when the client complains of “my guts falling out”
Or as an initial step with a large DRA whilst the woman gains proprioceptive control.
Others suggest usage while exercising or performing strenuous ADLs

Treatment, cont.
Taping
Used by 40.8% of survey responders in USA, but not researched (Keeler 2012)

So What?-Abdominal Function
- Gilleard and Brown (1996) found ↓ functional strength and endurance in 6 women with DRA
- Liaw (2011):
  - Muscle strength and static endurance improved as IRD ↓ (measured by US) in a longitudinal cohort of 40 pp women. Measured at 7 week pp & 6 mos. pp
  - Abdominal mm function remained impaired in postpartum women compared to a group of nulliparous women

The “So What?”-Impact Elsewhere
- DRA and lumbopelvic pain (Parker 2009):
  - Women with a DRA tended to have a ↑ degree of abdominal or pelvic region pain compared to controls but not functional deficits.
  - And no ↑ LBP
- DRA and urogynecologic dysfunction (Spitznagle 2007)
  - Overall DRA prevalence of 52% within the 547 charts reviewed. 66% of the patients with a DRA had one or > pelvic floor dysfunctions present. (Note: Study cannot determine causality↑)
  - The mean age of the subjects was 52.5 years and 58% of the subjects were menopausal.
Lab Activities: Manual Techniques, Exercises, Support Garments

- DRA assessment with fingertip method
- Practice RA-Noble exercise with and without pelvic tilt
- Practice RA-TRA-Pelvic Tilt together
- Practice TRA contraction with other UE, LE exercises
- Discussion on binders and tape options

References Diastasis Recti Abdominis