Pelvic Mechanics and OMT in Pregnancy

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Disclaimer/Conflicts

- No conflict to report
**Epidemiology**

- Low back pain or pelvic pain reported during pregnancy: 50-75%
  - Increased incidence with subsequent pregnancies
  - Increased incidence with elevated BMI in nulliparous

- Severe/disabling pain: ~35%

- Continued low back pain after pregnancy:
  - 66% @ 1 year
  - 16% @ 6 years

- < 4 hours of sleep/night: 80%

- Offered management options: 15%
  - <10% (1.5% overall) satisfaction with treatment
Cost

- Sick leave
- Medication
- Devices
- Consultation
Impact

- 30% stop performing at least one daily activity d/t pain
- 10% take time off from work
  - m/c reason for sick leave in working pregnant women
- Increased likelihood for depression 6-7 months PP
- Decreased
  - Perception of health and quality of life
  - Sexual satisfaction
- Restraint from future pregnancy
Predictors

- Age
- LBP during menstruation
- Previous history of back pain
- Previous LBP during pregnancy
Presentation

- Varies significantly
- Ignored as “normal”

Location
- Low Back
- Sacroiliac/Posterior pelvic
- Pubic Symphisis

Temporality
- May be present at any stage during pregnancy
  - m/c: 20-30 wks
- More often at night

Mogren et al.
Etiology of LBP in Pregnancy

- **Multifactorial**
  - Postural Changes
  - Mechanical Load Changes
  - Hormonal Changes
  - Water Retention
  - Vascular Changes
  - Uterine Displacement
Postural Changes of Pregnancy
Postural Changes of Pregnancy

- **Center of gravity shifts forward**
  - Anterior Head Carriage
  - Cervical hypolordosis
  - Thoracic hyperkyphosis (~6°)
  - Lumbar hyper/hypolordosis (~7°)
  - Accentuation of anterior pelvic tilt
    - Sacroiliac joints resist forward rotation = **PAIN**

- Anterior Pelvic Tilt and Lumbar Lordosis changes exaggerate as the sacroiliac ligamentous laxity increases
Mechanical/Load Changes

- Weight Gain
  - 25-35 lbs
  - 20% weight gain → increase force on a joint by as much as 100%

- Intra-articular bleeding/synovial fluid effusion

- Decreased stability

- Standing/Gait changes

- Muscle fatigue
Mechanical/Load Changes

- **Low Back Pain**
  - “Spinal Shrinkage”
  - Axial Load \( \rightarrow \) Disc compression
  - Poor recovery during pregnancy

- **Posterior Pelvic Pain**
  - SI joint strain/instability

- **Pubic Pain**
  - Pubic Symphiseal dysfunction/diastasis
    - Normal widening < 10 mm
  - Increased PSA
    - 10th to 12th week of pregnancy
    - Tenderness
    - Exacerbated by exercise

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Rodacki et al.
Hormonal Changes

Relaxin
- Corpus Luteum
- Late luteal phase and during the entirety of pregnancy
- Fluctuating Levels
  - Initial increase with peak value at the 12th week
  - Decline until the 17th week
  - Stable @ 50% of peak thereafter
- Inhibits collagen synthesis → amplifies the activity of collagenase
- Enhanced fluid retention
Hormonal Changes

- “Pelvic Girdle Relaxation”
  - Ligaments around pelvic joints and cervix
    - SI
    - PLL
    - Spinal ligaments

Problem: *Correlation of levels to pain/instability*
Water Retention

- ~ 6.5 liters
- Predisposition
  - Tenosynovial imbrication
  - Nerve entrapment
Vascular Changes

Vena caval obstruction

Increased interosseous pressure

Neural Edema

Hemostasis in vasa nervorum
Uterine Displacement

- **Posterior**
  - Nerve compression
    - Radiculopathy

- **Anterior**
  - Muscle strain
    - Muscle fatigue
Treatment Options

Education

- Posture and body mechanics from first trimester
- Expectations for LBP

Exercise Programs

<table>
<thead>
<tr>
<th>TABLE 1 Absolute contraindications to aerobic exercise during pregnancy*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemodynamically significant heart disease</td>
</tr>
<tr>
<td>Restrictive lung disease</td>
</tr>
<tr>
<td>Incompetent cervix/cerclage</td>
</tr>
<tr>
<td>Multiple gestation at risk for premature labor</td>
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<tr>
<td>Persistent second or third trimester bleeding</td>
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<tr>
<td>Placenta labor during the current pregnancy</td>
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<tr>
<td>Ruptured membranes</td>
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<tr>
<td>Preeclampsia/pregnancy-induced hypertension</td>
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</tbody>
</table>

Treatment Options

- **Devices**
  - Decreased loading
  - Reduce utilization
- Pelvic support/Trochanteric belt
- Pillow
- Taping

Cellacare Materna
(www.lohmann-rauscher.cz)

Materna
(www.ergon.cz)

Store No.: 817816
Treatment Options

- Analgesia
  - Tylenol
  - Narcotics
  - Joint injection

- Physiotherapy
  - Heat – risk of maternal hyperthermia
  - TENS – avoid contact to fetus
  - Therapeutic Ultrasound – contraindicated
Treatment Options

- Manual
  - Soft Tissue Massage
  - Chiropractic
    - SI joint pain
    - Length of Labor
  - Osteopathic
Evidence of Benefit from OMT

- Low back pain
  - 49% reduction in narcotic use
  - 84-91% improvement with OMT
  - No adverse events reported

- Viscerosomatic Link

  Decreased probability of having meconium-stained amniotic fluid
  Decreased use of forceps during delivery
  Decreased likelihood of having a preterm delivery
  Decreased duration of labor
  Decreased blood pressure
  Decreased fluid overload
  Decreased sacroiliac dysfunction
  Decreased low back pain
  Decreased carpal tunnel symptoms
Evidence of Benefit from OMT

Licciardone et al. January 2010

- Randomized, placebo-controlled clinical trial
- 3 arms: OMT (except HVLA), sham U/S, no care
- OMT group
  - Decreased back pain
  - No deterioration of back-specific functioning
Contraindications to OMT in Pregnancy

- Undiagnosed vaginal bleeding
- Threatened abortion
- Ectopic pregnancy
- Placenta Previa
- Placenta abruption
- Premature rupture of membranes
- Preterm labor (relative contraindication)
- Prolapsed umbilical cord
- Eclampsia and severe pre-eclampsia
- Surgical or medical emergencies (other than those listed above)
Osteopathic Evaluation

- Palpation (TART)
  - Tenderness
  - Asymmetry
  - Restricted motion
  - Tissue texture change

- Identify the pain causing structure

- Identify the somatic dysfunction
  - Stork Test – “Overtake Phenomenon”
  - FADE Test
  - FABER Test

From McIntyre and Broadhurst
OMT Techniques for LBP in Pregnancy

- Muscle energy
- Myofascial release
- Ligamentous articular strain
- Balanced membrane tension
- High-velocity, low amplitude thrust
- Strain counter-strain
- Osteopathy in the cranial field
Pubic Symphysis MET/HVT
“Shotgun Technique”

- If severe instability, surgical referral may be indicated
- Mild-Moderate instability can be resolved by restoring position and movement in the opposite direction(s) of the instability
- Maintained joint approximation for a period of time
  - Facilitate scar tissue development
  - Reduce reflexive muscular inhibition
    - Increase in muscle tone reflexively
    - Increases in ligament tone (through partial insertion or fascial expansions)
- Afferent barrage in the spinal cord
  - Decrease in pain due to “Gate Control” Theory
Pubic Symphysis MET/HVT
“Shotgun Technique”
Sacral Rocking

Physiology:
- Sacral base moves around the S2 axis
  - posterior (counter nutation) with inspiration
  - anterior (nutation) with expiration

Goal:
- To help regulate parasympathetic outflow to the pelvis

Technique:
- Pt prone
- Practitioner places hands on the sacrum
- Pressure is applied to enhance respiratory motion of the sacrum
Sacral Rocking
Prevention

- Low back pain screening
  - Early antepartum
  - Prior h/o LBP
  - Multiparity
  - Smoking
  - Young age
- Post partum
Questions?
Thank You