Clinical Integration of Osteopathic Manipulative Medicine

Obstetrics and Gynecology - Preterm Labor

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Introduction:

The WHO estimates the global incidence of preterm births to be 9.6% in 2005, with 85% of the global health burden concentrated in Africa and Asia.¹ The United States has seen a rise of preterm births, with a peak rate of 12.8% preterm deliveries in 2006, and 11.7% in 2011.² Preterm birth is a major determinant of neonatal mortality and morbidity, and still accounts for 35% of deaths in the first year of life in the United States (U.S.).² This indicates that preterm birth is both a serious global health and national health burden.

Furthermore, the etiology of preterm labor is multifactorial, and still not completely understood. It is estimated that 45-50% of all preterm deliveries are idiopathic, whereas 30% are attributable to preterm premature rupture of membranes (PPROM), and 15-20% are medically indicated or elected deliveries.¹ Identifiable risk factors for preterm labor in singleton pregnancies include: black maternal race, previous preterm delivery (independent risk factor, with 1.5-2 times attributable risk in further pregnancies), genitourinary infections, smoking, extremes of body weight, social disadvantage.² Additionally, short cervical length (less than the 10th percentile for gestational age) is shown to be an independent risk factor with a direct correlation to preterm labor.³ There is also evidence that labor begins when the ratio of progesterone activity to estrogen activity is reversed or when progesterone is blocked. Inadequate levels of progesterone may therefore also be a factor in triggering preterm labor.²

Patient presentations:⁴

- Change in type of vaginal discharge (Watery, Mucus, Bloody)
- Increase in amount of discharge
- Fever, Headache
- Pelvic or Lower abdominal pressure
- Constant low, dull backache
- Mild Abdominal Cramps, with or without diarrhea
- Regular or frequent uterine contractions, or uterine tightening, often painless
- Rupture of membranes

Differential diagnosis:⁵,⁶

- Appendicitis
- Urinary Tract Infection
- Ovarian Cyst
- Ovarian Torsion
- Placental abruption

Clinical pearls and diagnostic tools:
Clinical Diagnosis- presence of clinical criteria of regular painful contractions accompanied by cervical changes such as dilation or effacement. The presence of vaginal bleeding and/or ruptured membranes increases diagnostic certainty. (Prediction and early detection of preterm labor.) Specific clinical criteria, initially developed for research purposes, include regular painful contractions (either 4 every 20 minutes or 8 every 60 minutes) along with cervical effacement greater than 80% or cervical dilation greater than 2cm.7

Women who do not meet clinical criteria are diagnosed with false labor and often go on to have a late preterm or term delivery. 7

Non-Hispanic black women have a higher risk of preterm delivery than do women of any other racial or ethnic background.8

Risk Factors: Black maternal race, previous pregnancy with an adverse outcome, genitourinary infection, smoking, extremes of body weight, social disadvantage, maternal depression, pre-pregnancy stress, poor diet, assisted fertility, and periodontal disease.2,9

Preterm birth accounts for 28% of all neonatal mortality unrelated to congenital defects and is a major determinant of neonatal morbidity. Preterm neonates have increased rates of: cerebral palsy, sensory deficits, learning disabilities, and respiratory illnesses.4

OMM Integration: Past studies of osteopathic manipulative medicine in pregnancy primarily point to the benefits of OMM in reducing pain in pregnancy and labor, especially lumbar back and sacroiliac pain.10 Additionally, OMM has been shown to both reduce labor time in primiparous and multiparous women (Whiting, Hart), as well as induce uterine contractions in cases of women presenting with stalled labor.11,12 There is only one assessment to date of the effects of OMM on preterm labor, which showed a significant reduction of preterm labor rates in women receiving prenatal OMM (4% in OMM group versus 12% in the non-OMM group).13 This study suggests that OMM treatments both prenatally and at the onset of preterm labor may help to reduce the rate of preterm delivery.

Although a majority of the cases of preterm labor are idiopathic, the link between infection and preterm labor has long been recognized, with at least 40% of preterm births associated with intrauterine infection.14 A few studies have therefore pointed to the role of the immune system and the activation of the inflammatory cascade as a trigger for the initiation of labor.15,16 Agrawal and Hirsch proposed a ‘two-hit hypothesis’ to explain the pathophysiology of infection-associated preterm labor. They discovered a synergistic activation of multiple toll-like receptors during pregnancy, which would blunt the immune system to mild insults while amplifying the labor response to severe infections, in an act of self-preservation. In can be theorized then, that OMM throughout pregnancy that target restrictions to lymph flow may assist in clearing subclinical infections more efficiently, leading to a decreased activation of the inflammatory cascade which, upon a more severe insult, may induce preterm labor.

As mentioned before, progesterone has an essential role in maintaining pregnancy, and progesterone therapy is an effective intervention for preventing preterm delivery in women with specific risk factors.17 The mechanism of action of progesterone to prevent delivery may involve its anti-inflammatory properties. Progesterone analog administration to infected mice was associated with decreased inflammatory mediators, prevention of cervical ripening, and a reduction in preterm labor.18 Progesterone, produced by the corpus luteum, adrenal gland, and in pregnancy, the placenta is stimulated luteinizing hormone, which is released from the anterior pituitary. Although Jones and Lockwood demonstrated that cranial osteopathy, specifically the CV4 technique, assisted in the induction of uterine contractions12, cranial osteopathy may still be beneficial in the prevention of preterm labor. The structural relationship of the sella turcica, the depression of the sphenoid bone where the pituitary sits, as well as the proximity of the third ventricle to the hypothalamus and pituitary, suggest that cranial techniques such as subcondylar decompression, suture releases and CV4 may alter any strain patterns affecting the function of the gland.

Osteopathic Structural Examination: There are no established somatic dysfunctions which should be assessed in a patient presenting in preterm labor. Anatomical regions to assess throughout pregnancy include19,20:

- Cranial Vault
• Thoracic Outlet
• Thoracic Diaphragm
• Lumbar Region
• Sacroiliac joint

Possible Treatments Options to be used throughout pregnancy with the goal of reducing the rate of preterm labor:

• Doming of the Abdominal Diaphragm
• Osteopathy in the Cranial Field- Balanced Membranous Tension, CV4, Frontal and Maxillary lifts, subcondylar decompression, suture release
• Lymphatic Pumps
• Balance Ligamentous Tension (BLT) to the Thoracic outlet, and Abdominal Diaphragm
• Sacral Rocking

Contraindications to OMM in pregnancy:

• Undiagnosed vaginal bleeding
• Threatened or incomplete abortion
• Ectopic pregnancy
• Placenta previa
• Placenta abruption
• Premature rupture of membranes (PROM)
• Preterm labor (relative contraindication)
• Prolapsed umbilical cord
• Eclampsia or Preeclampsia

Citations:


