



WOMEN'S HEALTH

## Supporting a Woman's Body and Fetal Development During Pregnancy

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Pregnancy is considered the ultimate "stress test" of a woman's body. Immediately upon conception, a woman's body begins the beautiful process of preparing for the arrival of a precious little life. Hormonal changes, which begin in the first trimester, will lead to many physiological changes throughout the body. These changes help prepare the mother's body for pregnancy, childbirth and breastfeeding.

### Hormonal Influences on Pelvic and Spinal Instability During Pregnancy

The hormone *relaxin* peaks at about 14 weeks. The function of this hormone is to prepare the body for childbirth by relaxing the pelvic ligaments, and softening and widening the cervix. However, with this process comes concerns over pelvic and spinal instability and altered biomechanics throughout pregnancy and during the postpartum period.

There are differing opinions as to how long relaxin remains in the body postpartum, with suggestions being anywhere from five months up to one year. Breastfeeding is said to prolong the presence of relaxin postpartum.



Instability of the pelvis and spine during pregnancy leads to postural changes and poor body mechanics, which will contribute to the etiology of common, but not normal, symptoms women experience during their childbearing years. Some such symptoms are:

- Low back pain
- Pubic symphysis separation / pelvic girdle pain
- Sacroiliac dysfunction
- Sciatica
- Upper back and neck pain
- Foot pain
- Overpronation
- Diastasis recti

#### Neuromusculoskeletal Pain Syndromes and Pregnancy

Low back pain is a common neuromusculoskeletal problem during pregnancy, with an estimated prevalence ranging from 30-78 percent in the United States, Europe and some parts of Africa.<sup>1</sup> Pregnancy-related pelvic joint disorders including pubic symphysis separation, pelvic girdle pain, sacroiliac joint pain and pelvic girdle syndrome (pain in all three pelvic joints) can arise during pregnancy following increased mobility and/or mechanical strain, which can involve one or more of the pelvic joints.

Pubic symphysis separation (symphysis diastasis) is diagnosed based on the persistence of symptoms and a separation of more than 10-13 mm on imaging. Pelvic girdle pain (PGP) is sometimes classified under the broad category of low back pain. It is a specific form of low back pain, with onset during pregnancy or the immediate postpartum period.

It is generally described as a stabbing pain in the buttocks distal and lateral to L5-S1, which can radiate down to the knee and is often worse upon weight-bearing. It is related to nonoptimal

stability of the pelvic girdle joints; hence, pain in the symphysis pubis, and/or uni- or bilateral pain in the sacroiliac joints, is designated as PGP.<sup>2</sup>

Foot pain is significantly more common in pregnant women than in nonpregnant, nulliparous women, with potential causes being weight gain, peripheral ligamentous laxity, and changes in posture and pedal pressure points.<sup>3</sup> The timing of symptom onset in mid- to late pregnancy may suggest biomechanical factors play a larger role than hormonal influences when it comes to foot pain. Regular exercise appears to be neither protective against nor a risk factor for lower extremity pain during pregnancy.<sup>4</sup>

#### OTC Analgesics: Related Pregnancy and Neurodevelopmental Concerns

Given the high incidence of reported musculoskeletal pain syndromes during pregnancy, it is important for the chiropractor to understand the potential consequences for both mother and child from the use of analgesics during pregnancy. It has been reported that between 40-65 percent of pregnant women use acetaminophen, the main ingredient in Tylenol, with estimates of 3-20 percent of women reporting use in all three trimesters<sup>5</sup> and 18.4 percent use of ibuprofen.<sup>6</sup>

Emerging studies have shown consistent associations between maternal acetaminophen use and select pregnancy and childhood adverse outcomes, including pre-eclampsia, preterm birth, asthma, and neurodevelopmental disorders;<sup>5</sup> particularly autism and ADHD.

Acetaminophen is known to wipe out the body's main antioxidant, glutathione, thereby exposing the developing fetus to higher levels of oxidative stress and toxic loads during critical windows of neurodevelopment. In a study of 300 African American and Dominican Republic children living in New York City, children who were exposed to acetaminophen prenatally were more likely to have asthma symptoms at age 5.

Building on prior research showing an association between both prenatal and postnatal acetaminophen and asthma, this was the first study to demonstrate a direct link between asthma and an ability to detoxify foreign substances in the body. The results of this study suggest less efficient detoxification is a mechanism in the association between acetaminophen and asthma.<sup>7</sup>

It has been hypothesized that acetaminophen may induce autism through oxidative stress and neurotoxicity in susceptible individuals. Acetaminophen in a dose-dependent model increases the rate of reactive oxygen species (ROS) production. The high level of ROS depletes glutathione, and the induced oxidative stress causes neurotoxicity and reduces cortical neuronal cell viability by apoptosis.<sup>6</sup>

It has also been shown that prenatal and early-life exposure to both acetaminophen and ibuprofen were associated with poorer executive function and behavior in childhood.<sup>7</sup>

#### Chiropractic Supportive Measures for the Pregnant Woman

Chiropractic care to help support the adapting musculoskeletal and nervous system, and minimize pain / discomfort during pregnancy and during labor and delivery, is vital. In addition to specific spinal adjustments using adaptive techniques, including the Webster technique, other supportive measures to help enhance spinal and pelvic stability that should be considered are:

- Proper nutritional intake of protein and healthy fats

- Supplementation of vitamin B<sub>6</sub> to support ligamentous changes
- Exercise such as yoga and Pilates specific to the pregnant woman
- Pelvic tilt exercises and pelvic floor exercises such as Kegels
- Sacral belt use
- Custom orthotic supports made specifically for pregnant women and designed to reflect the biomechanical changes that occur in the second and third trimester, as well as the postpartum period.

### References

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