# Introduction

Overall cesarean section rates increased 60% from 1996 to 2009, and nearly 1 in 3 pregnant women can expect to undergo this surgery. Induction of labor (IOL) is performed in 20-44% of nulliparous women. Estimates place failure rates for labor induction between 23.7% and 41.2%. Research studies in the past have evaluated Osteopathic Manipulative Treatment (OMT) during pregnancy with promising results, such as reduction of low back pain and labor duration.

# Hypothesis

The hypothesis of this research study is that OMT delivered during IOL can improve success rates and decrease the rate of Cesarean deliveries. If OMT improves labor outcomes, it may revise the standard of care in managing pregnant women undergoing IOL.

# Methods

Patients were selected from the labor and delivery department at Morristown Medical Center (NJ), after having met the inclusion and exclusion criteria. Inclusion criteria consisted of: induction of labor after 37 weeks and 0 days gestation; Bishop score less than or equal to 6 (see chart). Exclusion criteria consisted of: prior cesarean section; preterm (less than 37 weeks and 0 days gestation); placental abruption; placenta previa; cord prolapse; neuromuscular disorder; chromosomal abnormality in mother; preeclampsia with severe features; eclampsia; any contraindication of vaginal delivery; hemodynamically instability. Patients provided written consent.

Intervention was limited to one episode of OMT delivered during active labor. OMT addressed predetermined regions (including but not limited to head, cervical spine, thoracic spine, lumbar spine, sacrum, pelvis, abdomen, rib(s), and upper and lower extremities) but allowed for individual patient assessment.

Osteopathic treatment modalities included Myofascial Release, Muscle Energy, Counterstrain, Balanced Lигamentous Tension, Facilitated Positional Release, Still Technique, and Osteopathy in the Cranial Field. Thirty-five women undergoing IOL with a Bishop Score of 6 or less and 37 or more completed weeks gestational age were offered enrollment. The 44 case-matched control patients were obtained through retrospective chart review. Thirty-five women undergoing IOL with a Bishop Score of 6 or less and exclusion criteria. Inclusion criteria consisted of: Induction of labor (IOL) is performed in 20-44% of nulliparous women. Estimates place failure rates for labor induction between 23.7% and 41.2%.

# Results

The control group, receiving conventional treatment (CT), included 44 women, 15 of whom underwent a Cesarean delivery (failure rate 34.1%). Of the 44 women, 20 were healthy and 24 had comorbidities (54.5%), with 5 and 10 women undergoing Cesarean delivery, respectively (failure rate 25% and 42%). Twenty-two of the 44 women underwent late-term or elective IOL and 22 underwent IOL due to medical reasons, with 7 undergoing Cesarean delivery in each group (failure rate 32%).

The treatment group, receiving OMT and CT, included 35 women, 10 of whom underwent a Cesarean delivery (failure rate 28.5%). Of the 35 women, 9 were healthy and 26 had comorbidities (74.3%), with 0 and 10 undergoing Cesarean delivery, respectively (failure rate 0% and 38.5%). Thirteen of the 35 women underwent late-term or elective IOL and 22 underwent IOL due to medical reasons, with 1 and 9 undergoing Cesarean delivery, respectively (failure rate 7.6% and 41%).

Among women who received OMT and CT versus CT alone, there was overall no statistically significant reduction in the rates of Cesarean deliveries (p=0.30).

There was a statistically significant reduction in the rates of Cesarean deliveries among women who received OMT and CT and were healthy (n=9; p=0.01) and those who presented for postdates or elective induction of labor (n=13; p=0.03).

We did not find that adding OMT led to a significant difference in failure rates among women with comorbidities (n=26; p=0.41) or those having inductions for medical reasons (n=22; p=0.27).

The average age of women who underwent a Cesarean delivery and a vaginal delivery was 32.5 and 32.9 for the intervention group, and 32.4 and 32.76 for the control group, respectively.

# Conclusion

This study reveals that OMT delivered during labor induction improves success rates for women without comorbidities and for those presenting for elective or late-term labor inductions. It is worth noting that there was a 19.8% greater incidence of comorbidities in the intervention group compared to the control group. This could have resulted in greater failure rates in the intervention group.

Study limitations include a lack of randomization and a smaller sample size. A larger, prospective, randomized, single-blinded study is being undertaken to investigate this relationship further.