

Evaluation of osteopathic manipulative treatment in pain reduction in pregnant women during third trimester and postpartum: Review Article

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Abstract:

The female body undergoes physiological changes during pregnancy that often lead to low back pain (LBP). To assess a non-pharmaceutical treatment option for LBP, a literature review was conducted comparing research trials using Osteopathic Manipulative Treatment (OMT) and its effect on LBP experienced in the third trimester and postpartum. Research studies using the Visual Analog Scale (VAS) to rate pain were used and the effects of OMT was analyzed. It was found that, compared to usual treatment for LBP, OMT provided significant relief of pain for patients. While research conducted in pregnant populations is limited, further research is required to assess OMT technique models on individuals and the effect on pain throughout pregnancy through the postpartum period.

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Introduction:

During pregnancy, a mother's body undergoes physiological changes in response to the growing fetus, which can lead to the development of Low Back Pain (LBP). These changes include increased weight in the anterior abdomen and compensatory increases in lumbar lordosis and pubic symphysis dysfunction. In addition, there is increased axial loading of the intervertebral disks and compression of the lumbar spine. It is estimated that 25% of women experience at least temporary disability during pregnancy¹ and up to one third of pregnant women will experience severe pain.² Postpartum LBP is the leading cause of sick leave following delivery of the child.² Treatment options for LBP are limited as there are few pharmaceutical options recommended during pregnancy. Osteopathic Manipulative Treatment (OMT) provides a non-pharmaceutical option of treatment for women experiencing low back pain during pregnancy. OMT focuses on health and restoration of the musculoskeletal system and homeostasis. There is a lack of sufficient data that evaluates the use of OMT for treatment of LBP in women who are in

their third trimester of pregnancy. We aim to show that OMT can be a beneficial adjunctive treatment that can provide LBP relief during pregnancy and postpartum. OMT provides a non-pharmacologic option for the reduction of third trimester and postpartum low back pain.

Methods:

The electronic databases PubMed, OstMed, and the JAOA were searched using the terms "osteopathic manipulative treatment and low back pain in pregnancy", from inception until July 15, 2020. All relevant publications were researched. Only research studies assessing OMT usage in women with LBP in their third trimester or postpartum that utilized a Visual Analog Score (VAS) were included in analysis. The VAS data was then compared to assess the effect of OMT on LBP.

Results:

We identified three large-scale studies focused on evaluating the use of OMT in the third trimester or post-partum period, which assessed pain utilizing a quantified VAS (Table 1).³⁻⁵

Table 1: Summary of characteristics and findings of included papers

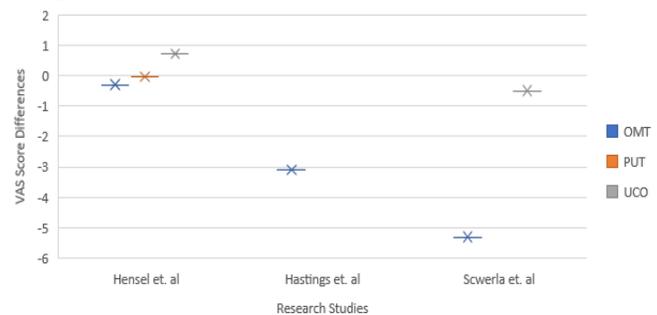
| Study Period | During Pregnancy | Postpartum | Postpartum |
|--|--|---|--|
| Author and Year | Hensel et al., 2015 ³ | Schwerla et al., 2015 ⁴ | Hastings et al., 2016 ⁵ |
| Country | USA | Germany | USA |
| Study Design | Randomized Control Trial | Randomized Control Trial | Case series |
| Study Objective | Evaluate the efficacy of OMT to reduce LBP and improve functioning during the third trimester in pregnancy. | Evaluate the effectiveness of OMT in women with persistent LBP and functional disability after childbirth. | Investigate the effects of OMT on postpartum pain; the location, quality, and timing of pain. |
| No. of Patients in Trial (No. of dropouts) | 400 women 99 women completed all 7 visits 357 women completed at least 4/7 visits | 80 women (3 dropouts) | 59 women |
| No. of Patients (mean age) | a. 136 (23.0 years) b. 131 (24.1 years) c. 133 (24.7 years) | a. 39 (33.9 years) b. 40 (33.3 years) | a. Not provided b. No control group |
| Treatment Type (No.) | a. OMT (7) b. Placebo ultrasound treatment (PUT) c. Usual care only (UCO) | a. OMT (4) b. No treatment | a. OMT* b. No control group |
| Author Conclusions | OMT was effective for mitigating pain and functional deterioration compared to the UCO group; however OMT did not differ significantly from PUT. | During 8 weeks, OMT applied 4 times led to clinically relevant positive changes in pain intensity and functional disability in women with postpartum LBP. | Preliminary results demonstrate that OMT is efficacious for postpartum pain management. The lack of a control group precludes the ability to make causal claims. |

OMT: osteopathic manipulative treatment, PUT: ultrasound treatment, UCO: usual care only, * number of treatments was not disclosed/unknown

Hensel et. al performed a randomized control trial (RCT) in the U.S. evaluating the efficacy of OMT to reduce low back pain (LBP) and improvement in function during the 3rd trimester, as compared to placebo ultrasound treatment and usual care only.³ The OMT group in this study had the greatest VAS score at baseline (3.49) and reported a VAS reduction of 0.299 (P<0.01) from baseline, following completion of at least 4 treatments, as compared to VAS change of -0.034 and +0.707 (P<.001 for both) in the placebo ultrasound treatment and usual care

only groups, respectively (see Figure 1 and 2). These findings indicated significant treatment effects for pain and back related functioning, with outcomes for the OMT group, similar to that of the Placebo Ultrasound Treatment (PUT), but both groups were significantly improved compared to Usual Care Only (UCO).

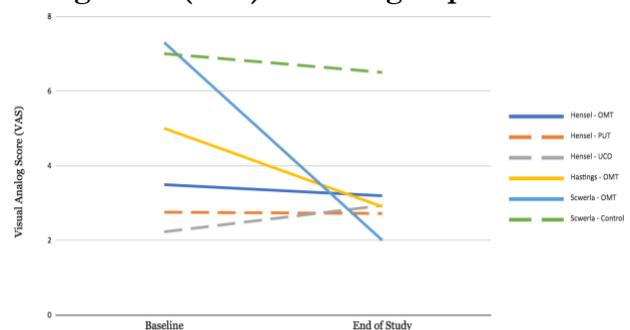
Figure 1: Visual Analog Score (VAS) differences on pain levels



OMT: osteopathic manipulative treatment, PUT: ultrasound treatment, UCO: usual care only

Schwerla et. al performed a RCT in Germany evaluating the effectiveness of Osteopathic Manipulative Therapy (OMT), as compared to standard of care in women with persistent LBP and functional disability after childbirth (Figure 1 and 2).⁴ During 8 weeks, OMT was applied over 4 sessions with pain intensity decreasing in the OMT group from 7.3 to 2.0 (P<0.001) as compared to 7.0 to 6.5 (P=0.005) in the control group. This demonstrated a statistically significant improvement in pain intensity (between-group difference of means, 4.8 with P<0.001) and level of disability (between-group difference of means, 10.6 P<0.005) in the OMT group.

Figure 2: Baseline and end of treatment visual Analog Score (VAS) for each group



OMT: osteopathic manipulative treatment, PUT: ultrasound treatment, UCO: usual care only

Hastings et. al's case series followed 59 postpartum women reporting pain in St Barnabas Hospital in Bronx, New York, who received OMT (Figure 1 and 2).⁵ The mean VAS score for pain was 5.0 before OMT and 2.9 after OMT ($P < .001$), with preliminary results demonstrating that OMT was efficacious for postpartum pain management.

Discussion:

This review found that the utilization of OMT led to a reduction in LBP for women both prepartum (third trimester) and postpartum. The Visual Analog Scale (VAS) was used to help patients visually rate their pain. Pain reduction effects were evaluated for statistical significance in all studies through the usage of p-values found through unpaired t-tests with an alpha of 0.05. This trend was seen standing alone and in comparison, to both usual care and placebo ultrasound. Variables consisting of BMI, parity, medication use, age, and form of delivery were all investigated and proven to not be confounders. Ridding of plausible confounders further stabilizes the relationship being investigated. Within the studies, the OMT technique models used consisted of high-velocity low-amplitude, muscle energy, myofascial release (sacral release), functional techniques, balanced ligamentous tension, facilitated positional release, soft tissue, and osteopathic cranial manipulative technique (CV4).³⁻⁵ Comparisons between techniques were not performed, proving to be a limitation. The review of all these studies as a composite did allow for eliminating the effects of instrumental bias, sampling bias, lack of control groups, and lack of blinding on the relationship being investigated. This was done by sampling papers with a range of geographic and demographic variables, as well as differences in treatment providing physicians. This review was also able to fill the gap seen in other papers, where results from OMT, based on pain reduction, were proven to be maintained 3 months post-procedure. An analysis of the research showed that OMT provided significant pain reduction to patients complaining of pregnancy related third-trimester and postpartum pain.

Conclusion:

Pregnancy related back pain continues to be widely experienced. This analysis shows that the inclusion of OMT to usual care provides relief to

patients who reported either third trimester or postpartum LBP. While there was some limitation in the type of data available to perform comparison studies, the studies selected in this analysis provide initial evidence of the effectiveness of pain reduction with the use of OMT. Further studies are needed to compare different OMT technique models with each other as well as larger patient populations to increase the power of the results.

Author Contributions:

All authors contributed to the conception and design of the work. All authors acquired and analyzed the data. All authors participated in the drafting and critical revision of the manuscript. All authors approved the final version of the manuscript to be published.

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The authors disclose that there were no conflicts of interest or financial support in the development of this project. All data is authentic and accurate.

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