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Effectiveness of Manual Treatment on Pregnancy Symptoms: Usefulness of Manual Treatment in Treating Pregnancy Symptoms

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ABSTRACT

Objectives: To determine the usefulness of manual treatment in reducing or eliminating pregnancy symptoms during first and second trimester. **Methods:** Manual treatment of the cervical and thoracic spine was performed in a group of 115 pregnant women who developed pregnancy symptoms during normal pregnancy. A rotational traction of the cervical spine was applied. Patients in whom the treatment was unsuccessful underwent second round of treatment after a pause of a minimum 3 days. Patients for whom the treatment was initially successful but later relapsed also repeated whole procedure. Pregnancy symptoms analyzed in this study were heartburn, nausea, vomiting, dizziness, headache, insomnia, neck pain, hyperosmia and hypersalivating. **Results:** Manual treatment successfully treated pregnancy symptoms in 91 (79.1%) patients, it was partially successful for 22 (19.1%), and unsuccessful for 2 patients (1.7%) after the first treatment. After the second treatment, out of a total 56 patients, the treatment was completely successful in 40 (71.4%), partially successful in 14 (25%), and unsuccessful in 2 (3.6%) patients. The highest success rate was in eliminating headache (97.3%), vomiting (95.9%), dizziness (94.5%), nausea (92.9%), neck pain (92.9%), insomnia (91.9%), heartburn (88.8%), hyperosmia (78.5%) and hyper salivating (78%). **Conclusion:** Manual therapy in pregnancy is a drugless, etiological, usually highly effective therapy. It is a low cost, rapid, safe, and well tolerated treatment for pregnancy symptoms which frequently has an immediate effect, thus making it an optimal treatment for pregnancy symptoms.

Keywords: manual treatment, pregnancy symptoms, effectiveness.

1. INTRODUCTION

Pregnancy symptoms have high incidence and almost all women experience them during pregnancy. Due to their high frequency, most physicians consider pregnancy symptoms as a normal phenomenon or sign of pregnancy. Pregnancy symptoms are considered as normal changes of the organism to the newborn condition. Zib et al., differentiated 34 symptoms with the five most common being: frequent micturition, fatigue, pelvic pressure, insomnia and low back pain (1) we conducted a prospective controlled study of symptoms during normal pregnancy in both primigravidas and multigravidas. A total of 38 symptoms occurred with a significantly different frequency (mainly increased). On the other hand, it has been suggested that nausea, vomiting, headache, dizziness are the most frequent symptoms in pregnancy. These symptoms usually appear together and lead to a lower

quality of life and limit functionality (2,3). Still others have observed frequent micturition and fatigue to be the two most frequent symptoms followed by low back pain, headache, sleep disorder, nausea vomiting and heartburn (2).

Chiropractic is a form of alternative medicine, which is focused on the diagnosis and treatment of mechanical disorders of the musculoskeletal system, especially the spine (4). Many studies have evaluated the effectiveness of chiropractic treatments in treating various disorders, but with contradictory results. The treatment of back pain is the only proven benefit of chiropractic treatments (5). Chiropractic is widely established in USA, Canada and Australia, while in Europe it is far less. Chiropractic considers subluxation as the root cause of many visceral dysfunctions and diseases (6).

The aim of this study is to evaluate effectiveness of manual treatment of

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the spine in reducing and eliminating pregnancy symptoms.

2. METHODS

The research was conducted on pregnant women from urban and rural areas in the Community Health Center Bijeljina, Bosnia and Herzegovina in the women's care unit from 2011 – 2013. The inclusion criteria were the presence of pregnancy symptoms that appeared for the first time during pregnancy. Study participants made no lifestyle or dietary changes, did not use medication or any other treatment for their symptoms except manual treatment. The study included randomly selected 115 pregnant women with normal pregnancies. Pregnant women were enrolled in the study when they came for their regular pregnancy control visits. To determine the possible recurrence, side effects, complications and impact of the manual treatment on the kind of birth and its outcomes, the effects of treatment were followed until the end of the pregnancy. All participants were informed of all the details of the study and all signed and informed consent form confirming their voluntary participation in the study. The study was carried out in accordance with Declaration of Helsinki. All of the pregnant women had a controlled pregnancy and the outcome of manual treatment was followed until delivery. Treatment was considered fully successful if, after a maximum of three treatments, the pregnancy symptoms no longer appeared until the end of pregnancy. It was considered partially successful if the pregnancy symptoms were less intensive than before the treatments, and unsuccessful if after the treatments there was no disappearance or mitigation of pregnancy symptoms.

Every pregnant woman was given a questionnaire which asked for: their age, occupation, previous diseases and injuries before pregnancy, date of their last period, pregnancy due date, the number of childbirths, the number of intentional abortions, the number of spontaneous abortions, difficulties in the previous pregnancies, diseases in the previous pregnancy, stress in the present pregnancy, diseases in the present pregnancy, medications used in the present pregnancy. They were also asked to disclose the week of the pregnancy in which symptoms first appeared, how many weeks symptoms persisted before the first treatment, and the time elapsed between manual treatment and the alleviation of symptoms. After the patient's medical history was filled out, a standard gynecological and ultrasound examination was performed, as well as routine laboratory tests using urine and blood samples. The rotation of the head to the left and right sides in degrees was measured. After that, the manual treatment of the cervical and thoracic spine was done. Treatment of patients with pregnancy symptoms consisted of three manual interventions: on the cervical spine, on the upper part of the thoracic spine and on the lower part of the thoracic spine.

Description of the Manual Treatment of the Cervical Spine (C1–C7)

During treatment the patient was sitting with a therapist standing on her left. The left hand of the therapist

held the right side of the head, and the middle finger of the therapist's left hand was placed on the blocked vertebral segment. The patient's head was tilted to the right and rotated clockwise to the physiological limit of the cervical spine. The blocked vertebral segment was found using the fingertips. It was unblocked using a quick small amplitude tap. The same procedure was repeated on the other side of the cervical spine. A "click" is usually heard upon unblocking the segment.

Description of the Manual Treatment of the Upper Thoracic Spine (Th 1 – Th4)

The patient was standing during treatment, with the therapist standing behind her. The patient interweaves her fingers and rests her palms on the nape of her neck. The therapist slipped his forearm between the upper arm and forearm of the patient who then pulls her elbows together. The therapist gently pulled the patient back and leaned the upper part of her thoracic spine to the front of his chest so that it was fixed. Upon the completion of expiration, the therapist made a slight traction of the upper part of the spine by pulling the patient's forearms and body back and up using a small amplitude high speed whipping motion. The indiscriminate traction of the upper thoracic spine and unblocking of the vertebrae are done performed in this manner. A "click" is usually heard upon unblocking the segment, implying release.

Description of the Manual Treatment in the Lower Thoracic Spine (Th5–Th12)

During treatment the patient was standing, with the therapist standing behind her. The pregnant woman put her left palm over her left eye and right over her right eye. She put her elbows together and drew them against her chest. The therapist held the woman around the lower part of her chest with their hands so that their fists were holding her elbows. The pregnant woman was slightly tilted back toward the therapist so that her thoracic spine was fixed to the front side of the therapist's chest. Upon completion of expiration the therapist made a slight traction of the upper part of the spine by pulling the patient's forearms and body back and up using a small amplitude high speed whipping motion. Indiscriminate traction of the lower thoracic spine and unblocking of the vertebrae are performed in this manner. A "click" is usually heard upon unblocking the segment, implying release.

The manual treatment lasted for 3-5 minutes, it was painless and very well tolerated. After a minimum of three days or maximum at the next gynecological consultation, it was ascertained whether the treatment of the pregnancy symptoms was successful, partially successful or unsuccessful. Any new problems which occurred after the treatment were noted. Any adverse reactions after the treatment, or eventual relapse after successful treatment and the time elapsed since the disappearance or alleviation of pregnancy symptoms were also recorded.

The results are presented as count, percent, and mean \pm standard deviation. Data analysis was performed analyzed using SPSS 20.0 software package. All p values <0.05 were considered statistically significant.

3. RESULTS

Patient socio-demographic and medical history data are shown in Table 1.

Age (years)*	27.1 ± 4.8 (17-38)
Previous Pregnancy Data N (%)	
Deliveries	
nulliparous	37 (32.2%)
uniparous	59 (51.3%)
pluriparous	19 (16.5%)
Miscarriages	16 (13.9%)
Abortions	11 (9.6%)
Previous diseases	20 (17.4%)
Previous injuries	23 (20.0%)

Table 1. Participant Characteristics and Pregnancy History.* mean ± sd (min–max)

The table 1 shows that the participants were 27.1 ± 4.8 years old. Approximately one third of the patients were nulliparous, while half were uniparous. Most patients did not have spontaneous or intentional abortions. About one fifth of patients has serious illness, surgery, significant injury or health problems before pregnancy. Of the 79 patients who had a previous pregnancy (including one miscarriage), 74 (93.7%) experienced pregnancy symptoms during that pregnancy as well. Several patients experienced more pronounced stress, disease or used certain medications prior to study participation. The onset of pregnancy symptoms was in the first trimester of pregnancy. The patients had manual treatment performed approximately one month after the appearance of symptoms (Table 2). Manual examination revealed significantly reduced range of motion of the neck to the left in relation to normal rotation (p<0.001), which is 80 degrees. The same was shown for rotation to the right (p<0.001). Sound phenomena were most pronounced in the cervical spine. Most of the patients went into labor on their expected due date and had a vaginal delivery (Table 2). The most frequent symptom was nausea following by heartburn, vomiting and hyperosmia. Head-

	N (%)* / x±sd** / med (min-max)***
Stress	5 (4.3%)*
Illness	5 (4.3%)*
Medications	7 (6.1%)*
Symptoms started at week	6 (4-34)**
Duration of symptoms before first treatment (week)	4 (1-26)**
First treatment (week)	12 (7-36)**
Neck rotation to the left (°)	51.6±12.3***
Neck rotation to the right (°)	54.1±11.9***
Number of sound phenomena during treatment ("click")	
Cervical spine	4 (0-7)**
Thoracic spine	2 (0-4)**
Lumbar spine	2 (0-8)**
Term delivery†	83/96 (72.2%)*
Vaginal delivery	96 (81.7%)*

Table 2. Current Pregnancy. †Data available for 96 participants

	Heart-burn n=80 (69.6%)	Nausea n=98 (85.2%)	Vomiting n=74 (64.3%)	Dizziness n=55 (47.8%)	Neck pain n=50 (43.5%)
Successful	71 (88.8%)	91 (92.9%)	71 (95.9%)	52 (94.5%)	46 (92%)
1 treatment	46 (57.5%)	67 (68.4%)	52 (70.3%)	43 (78.2%)	37 (74%)
2 treatments	9 (11.3%)	9 (9.2%)	5 (6.8%)	1 (1.8%)	4 (8%)
2 treatments, 1 relapse	13 (16.3%)	10 (10.2%)	7 (9.5%)	3 (5.5%)	4 (8%)
3 treatments	0	1 (1%)	2 (2.7%)	0	0
3 treatments, 1 relapse	0	4 (4.1%)	4 (5.4%)	3 (5.5%)	0
3 treatments, 2 relapse	3 (3.8%)	1 (1%)	0	0	0
Partially successful	6 (7.5%)	4 (4.1%)	2 (2.7%)	3 (5.5%)	1 (2%)
Unsuccessful	3 (3.8%)	2 (2%)	1 (1.4%)	0	3 (6%)
Number of treatments					
1	48 (60%)	68 (69.4%)	53 (71.6%)	44 (80%)	38 (76%)
2	24 (30%)	21 (21.4%)	13 (17.6%)	5 (9.1%)	11 (22%)
3	8 (10%)	9 (9.2%)	8 (10.8%)	6 (10.9%)	1 (2%)
Number of relapses					
0	13 (40.6%)	13 (43.3%)	8 (38.1%)	1 (9.1%)	5 (41.7%)
1	16 (50.0%)	16 (53.3%)	11 (52.4%)	7 (63.6%)	6 (50%)
2	3 (9.4%)	1 (3.3%)	2 (9.5%)	3 (27.3%)	1 (8.3%)

Table 3. Pregnancy Symptoms I.

	Insomnia n=37 (32.2%)	Headache n=74 (64.3%)	Hyperosmia n=79 (68.7%)	Hypersalivating n=41 (35.7%)
Successful	34 (91.9%)	72 (97.3%)	62 (78.5%)	32 (78%)
1 treatment	31 (83.8%)	56 (75.7%)	43 (54.4%)	26 (63.4%)
2 treatments	2 (5.4%)	8 (10.8%)	13 (16.5%)	3 (7.3%)
2 treatments 1 relapse	0	6 (8.1%)	3 (3.8%)	2 (4.9%)
3 treatments	0	0	0	0
3 treatments, 1 relapse	0	2 (2.7%)	2 (2.5%)	1 (2.4%)
3 treatments, 2 relapse	1 (2.7%)	0	0	0
Partially successful	1 (2.7%)	1 (1.4%)	12 (15.2%)	5 (12.2%)
Unsuccessful	2 (5.4%)	1 (1.4%)	5 (6.3%)	4 (9.8%)
No treatments				
1	33 (89.2%)	56 (75.7%)	55 (69.6%)	32 (78%)
2	3 (8.1%)	14 (18.9%)	20 (25.3%)	7 (17.1%)
3	1 (2.7%)	4 (5.4%)	4 (5.1%)	2 (4.9%)
No relapse				
0	4 (100%)	8 (44.4%)	16 (16.7%)	5 (55.6%)
1	0	10 (55.6%)	7 (29.2%)	4 (44.4%)
2	0	0	1 (4.2%)	0

Table 4. Pregnancy Symptoms II.

ache was present in a similar frequency as heartburn and vomiting. Manual treatment was successful in approxi-

mately 90% of cases in reducing symptoms of heartburn, nausea, vomiting, dizziness, and in approximately 80% of cases in reducing hyperosmia and hypersalivation. Most patients required only one treatment (Table 3). After treatment, all patients were asked about new symptoms, outcomes and adverse events. The distribution of patients regarding first, second and third treatment is presented in table 5.

	I treatment (n=115)	II treatment (n=56)	III treatment (n=6)
New symptoms	10 (8.7%)	2 (3.6%)	0
Outcome			
Completely successful	91 (79.1%)	40 (71.4%)	4
Partially successful	22 (19.1%)	14 (25%)	2
Unsuccessful	2 (1.7%)	2 (3.6%)	0

Table 5. Overall Treatment Outcome

A small number of patients had new symptoms after the first and second treatments, but no new symptoms presented after the third treatment. The majority of patients had completely successful treatment, following by partially successful. Only two patients had unsuccessful first and second treatments.

4. DISCUSSION

Results of our study suggest that manual treatment of the cervical and the thoracic spine is effective in reducing pregnancy symptoms. The majority of patients exhibited an immediate alleviation of symptoms, while a small number required two or three manual treatments with complete or partial results. The therapy was unsuccessful in only 2 of 115 patients. The majority of patients reported the treatment as being completely successful. There were no adverse effects on pregnancy outcome and no complications were observed during the manual treatment. Complications of manual treatments are usually very rare and according to Haldeman et al. occur in 1:5.8 million of manual cervical treatments (7). Majority of pregnant women in this study indicated that they have had an easy and fast delivery. Based on the average age, we can conclude that the sample is representative, consisted of women of different socioeconomic status and education. Ulf Ulmsten and Gunnar Sundstrom found that pregnant women have a lower esophageal pressure, slower esophageal peristalsis with smaller amplitudes and higher intragastric pressure than women who are not pregnant, thus encouraging reporting of gastroesophageal reflux disease (GERD) in pregnancy (8). In contrast to the belief that GERD is caused by hormonal changes (9), the assumption in this study is that these changes are due to disturbances in nerve regulation. Most factors that lead to the decreased mobility of individual spine segments, increase their intensity with the progression of pregnancy (10). These factors include weight gain, changes in posture, increase concentration of relaxin and progesterone which by themselves increase the elasticity of ligaments and lead to instability of the spine. Some pregnant women with GERD eventually manage to adapt to these changes and heartburn spontaneously

disappears. This study confirms the above theory, as it shows that pregnant women in the study have a significant reduction in cervical movement left and right. So far, there has been only one case study that showed the positive effect of manual treatment of the cervical spine to heartburn in pregnancy (11). Due to the lack of scientific studies in this field, the conclusions of this study are only based the results of this research and personal prior positive experience of the author in the manual treatment of heartburn during pregnancy.

Nausea and vomiting in pregnancy is very common condition affecting approximately 70 -80% of pregnant women in western countries (12). On the other hand, it is very rare in Africa and Asia (13).

Possible causes of nausea and vomiting are young age, primagravidas, lower education, obesity, employment, income level, maternal genetics, anatomical, psychologic, gastrointestinal tract dysfunction, hormonal dysfunction, chronic infection of *Helicobacter pylori* (14). A number of causes of nausea and vomiting have been investigated, but the etiology remains unknown. Treatments range from dietary to pharmacotherapy and depend on the severity of the symptoms. Several studies have suggested acupressure and acupuncture as possible treatments (15–17), however one study that showed no effect of acupressure on early pregnancy symptoms (18). Literature searches revealed no study or case report regarding manual treatment, and nausea and vomiting in pregnancy. Our study results show a very high success rate of eliminating nausea and vomiting in pregnant women, with most results in the first treatment.

Headache is a very common condition and the most frequent reason for referral to a neurologist (19). Headache has female predominance with peak incidence in the second and third decades, peak prevalence in the fourth decade and most women (around 80%) of reproductive age experience headache at some stage (20–22). The pathophysiology of migraine is poorly understood with no one theory fully accounting for their varied presentations and symptomatology (23). Several studies demonstrated that high stable estrogen levels in pregnancy improve migraine symptoms, with up to 11% of women reporting improvement in the first trimester, 53% in the second and 79% in the third trimester (22, 24). Nonpharmacological measures for headache treatment are ice packs, massage, and relaxation as well as avoiding triggers and psychological stress, increasing the amount of sleep (25). Pharmacological treatment considers abortive therapy (paracetamol, opioids, antiemetics, aspirin and other NSAID, caffeine, ergot and triptans) and prophylactic (beta blockers, low dose of aspirin, antidepressants, antiepileptics and other drugs). Several studies revealed safe application of opioids, antiemetics, but also the unsafe use of aspirin and NSAIDs, ergot and triptans, antidepressants and antiepileptics. Alcantara and Cossete (26) reported a 24 year old gravid female patient with chronic migraine headaches since age 12, who was resistant or insensitive to pharmacological therapy. The study reports that chiropractic treatment had a positive effect on symptoms and independence from medication.

Based on results of our study, headache appears in first trimester in majority of pregnant women. Only several pregnant women had headaches before and after the first treatment. Those that still reported headaches after the first treatment had their headaches eliminated by the second or third treatment. Several studies have showed that alternative medicine approaches may have positive effect on pregnancy outcome. Study of Schlegel et al., on highly risk pregnancy reveals very good response of pregnant women on acupuncture, guided imagery, healing touch, massage and reflexology (27). Pain and anxiety in this study was significantly reduced using these treatments. In their review article Smith et al., systematize different alternative approaches in the preconception period and in pregnancy (28). A study by Weis et al., analyzed the attitude of gynecologists toward chiropractic practice in Canada and showed that 30% of gynecologist have positive attitude, while 37% is neutral and 33% had negative attitudes (29). The majority of gynecologists consider that chiropractic practices have a positive effect on certain musculoskeletal disorders but deny the possibility of eliminating neuromusculoskeletal symptoms (29).

Ptyalism gravidarum has unknown origin and is usually defined as an excessive secretion of saliva, common in women with nausea and vomiting who might have difficulty in swallowing their saliva (30). Salivary secretion is under neural control and stimulation of the parasympathetic nerve supply of the salivary gland causes a profuse watery secretion with very little organic content (31).

Using pharmacology treatment such as barbiturates and anticholinergics may have consequences on fetal development and are not recommended in pregnancy. Using gum or ice may be temporary coping strategies but these are not a satisfactory treatment. Suzuki et al., (30) presented case of ptyalism that was alleviated by chiropractic treatment at 20 weeks gestation. Our study also reveals high impact of chiropractic treatment on ptyalism in pregnancy. Majority of pregnant women had success during first or second treatment. In this study, manual treatment was found to be highly effective in treating neck pain during pregnancy, which is in accord with other studies (32). Sleep disorders are also very frequent during pregnancy and according to Lopes et al, their peak is during the second trimester (33). In our study it is shown that chiropractic treatment in highly effective in treating insomnia after one treatment.

5. CONCLUSION

Manual therapy in pregnancy is a low cost, drugless, etiological, usually highly effective therapy, safe and well tolerable treatment, rapid, often has an immediate effect. This study suggests that it could be the first treatment of choice in treating GERD during pregnancy.

- **Conflict of interest:** none declared.

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