

Relationship Between Neck Pain, Disability and Head Posture in Women Six Months Post Delivery

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ABSTRACT

Background: In pregnancy and post-partum period, there are different structural, hormonal and physiological changes occurring in women's body. The musculoskeletal changes women undergo are ligamentous and collagenous connective tissue changes that lead to increased joint laxity and hypermobility. Usually, these hormonally mediated changes return to their normal pre-pregnant state by six months post-delivery. During the postpartum period, women have to deal with emotional and ergonomic stress due to increased responsibilities such as breastfeeding, nappy changing, maneuvering the baby causing a number of postural changes in them leading to pain which can cause disability and other musculoskeletal discomfort to perform daily activities.

Aim and Objectives: To assess the relationship between neck pain, disability and head posture in women six months post delivery.

Method: Sixty subjects were selected as per inclusion and exclusion criteria. Numerical Pain Rating Scale (NPRS) and Neck Disability Index (NDI) Questionnaire was used to evaluate neck pain and disability. The forward head posture was measured via craniovertebral (CV) angle by using Marcus Brader (MB) Ruler Software. Pearson's correlation coefficient between NPRS, NDI and CV angle were determined.

Result: NPRS was positively correlated with NDI ($r = 0.9072$, $p = <0.0001$) and negatively correlated with CV angle ($r = -0.3643$, $p = 0.0036$). No significant correlation was shown between NDI and CV angle.

Conclusion: The present study concluded that women with small craniovertebral angle have a greater forward head posture, and the greater the forward head posture the greater is the pain and disability.

Keywords: Correlation, neck pain, neck disability, craniovertebral angle.

INTRODUCTION

The period in which foetus develops inside a woman's womb is termed as pregnancy. It usually lasts about 40 weeks or just over 9 months, as measured from last menstrual period to delivery. Pregnancy brings about a lot of physiological and anatomical changes in women. [1] The physiological changes that occur during pregnancy affects the endocrine, reproductive, cardiovascular, respiratory, gastrointestinal, nervous, urinary as well as musculoskeletal system. These changes are a direct result of interaction of four factors that are - hormones causing collagenous and involuntary muscle changes, increase in blood flow and volume, growth of foetus and an increase in body weight leading to adaptive changes in the centre of gravity and posture.

Musculoskeletal changes include generalised increase in joint laxity and in range of motion which is hormonally mediated by estrogens, progesterone and particularly relaxin. [1] Due to this, pregnant women are usually at a risk of developing various musculoskeletal problems such as

low back pain, sacroiliac joint dysfunction, sciatica, thoracic spine pain, postural back ache, wrist pain, etc. It is necessary for a woman to adapt her posture in order to compensate for her changing centre of gravity which is due to the distending abdomen. There is increase in cervical, thoracic and lumbar curves and as a result back pain is a common symptom in pregnancy. The ligamentous and collagenous connective tissue changes that occur during pregnancy usually take upto 6 months to return to their pre pregnancy state after delivery.

Immediately after delivery begins postnatal period in which the establishment and maintenance of breastfeeding is the primary objective.^[1] Breastfeeding is a phase of extreme importance both for the mother and the child, it ensures the best possible physical and mental health as well as the best developmental and psychosocial outcomes for the infant.^[2,3] On the basis of empirical evidences on the benefits of breastfeeding, the World Health Organization (WHO) recommends breastfeeding for 2 years, with first six months of exclusive breastfeeding. In addition, the baby should be fed 8 times per day in the first 3 months of life.^[4] There are various positions mothers adopt in order to breastfeed their child some of the most common positions are cradle hold, cross cradle hold, side lying position.^[1] In the breastfeeding phase the mother will adopt the same posture for a long time and several times a day, and, when performed erroneously leads to not only difficult, but also causes tension in the muscles.^[3] Poor positioning when bathing, feeding, nappy changing and maneuvering the baby may all contribute to musculoskeletal changes and discomfort.^[5]

Mechanical neck pain, brachial plexus pain, carpal tunnel syndrome, kyphosis, lordosis, scoliosis, sciatica and mechanical low back pain are few of the problems most commonly encountered in postnatal women.^[6] These musculoskeletal postural problems have a higher dependency on

different positions attained during infant care and causes mechanical change in cervical, thoracic and lumbar spine that alters the correct posture of the body leading to long term deformities by disturbing the normal curvature of spine and producing hyper lordosis, hyper kyphosis and forward head posture along disability.

Hence, the main purpose of my study is to find out if there is a relationship between neck pain,

disability and head posture that persists even after all the hormonal and anatomical changes have returned to their pre pregnant state.

MATERIALS AND METHODS

The study was a cross-sectional correlation study where 60 women were selected using convenient sampling. The inclusion criteria to select the study population were non-exercising women willing to participate in the age group of 25-35 years and females between six to twelve months post-delivery. The exclusion criteria were recent fracture or surgery of the cervical spine or shoulder, history of any pain in the cervical and shoulder region, neurological and cognitive impairments. Materials used in the study included consent form, demographic data proforma, Neck Disability Index (NDI) questionnaire, pen/pencil, camera, MB ruler 5.0 software-triangular ruler.

PROCEDURE

A written informed consent was taken from all the subjects in the language best understood by them. Selection of subjects was done as per the inclusion and exclusion criteria. The purpose and procedure of the study was explained to all the subjects prior to the study. Demographic data was noted down. Numerical Pain Rating Scale (NPRS) and Neck Disability Index (NDI) scores were noted down which was used to assess neck pain and disability respectively. Head posture was assessed by measuring the craniovertebral angle.^[7]

Head posture Measurement (CV Angle) -

Subject was seated on a chair in her usual sitting posture and a lateral view photograph was clicked using a camera. They were told to sit relaxed with arms resting on the side of their body. Instructions were given to virtually focus on a point on the wall directly in front of them. Tragus of the ear was marked and another marker was placed on skin overlying the C7 vertebra. The

photo was captured in such a way so as to frame the head from the top to the base of the clavicle. Image was then uploaded to a computer software MB ruler 5.0 and the angle was calculated between the horizontal line passing from C7 and a line extending from tragus of the ear to C7 using triangular ruler.^[8] A craniovertebral angle of less than 53 degrees indicates forward head posture.^[9]



Figure 1: CV angle measurement using MB triangular ruler

STATISTICAL ANALYSIS

Collected data was entered in Microsoft Excel and Graph Pad Prism 9.4.0 was used for the data analysis. Pearson's correlation test was used to determine whether there is a correlation between neck pain, disability and head posture.

RESULTS

A total of 60 subjects were recruited in the study. The demographic characteristics of these subjects are shown in Table 1.

Mean Age \pm SD (in years)	29.75 \pm 2.92
Mean Post-delivery month \pm SD (in months)	8.63 \pm 1.39

Table 1: Demographic Characteristics

Pearson's correlation coefficient between NPRS, neck disability score (NDI) and CV angle are shown in Table 2. Results

demonstrated positive correlation between NPRS and NDI ($r = 0.9072$, $p = <0.0001$) that is, higher the pain more is the disability. NPRS was negatively correlated with CVA ($r = -0.3643$, $p = 0.0036$) that is, the smaller the CV angle, the higher is the NPRS score and vice versa. No significant correlation was shown between NDI and CV angle.

	NPRS	NDI	CVA
NPRS	1.000	$p = <0.0001$ $r = 0.9072$	$p = 0.0036$ $r = -0.3643$
NDI	$p = <0.0001$ $r = 0.9072$	1.000	$p = 0.0730$ $r = -0.1868$
CVA	$p = 0.0036$ $r = -0.3643$	$p = 0.0730$ $r = -0.1868$	1.000

Table 2: Pearson's correlation between NPRS, NDI and CVA

DISCUSSION

A cross-sectional correlation study was carried out for a period of 18 months to assess the relationship between neck pain,

disability and head posture in women six months post delivery. In this study, 64 women were willing to participate. Out of 64 women, 4 were excluded from the study as they were exercising. The mean age and post delivery month was 29.75 years and 8.63 month respectively. The standard deviation of age and post delivery month was 2.92 and 1.39 respectively. Out of the total participants 56.66% women fall in 25-30 years age group and 43.33% women fall in 35-40 years age group. A higher number of women who participated were in 7th and 8th month of their post delivery period.

Out of all the participants 50% women gave birth via normal delivery and 50% gave birth via cesarean section but irrespective of that, women from both groups had neck pain and disability. For 30% of the women it was their second child and it was found out that they suffered less neck pain and this might be because they were aware about what postures to use that will yield effective breast feeding and not cause pain and discomfort.

The most common breast feeding position that was adopted by women was cradle hold in which they have to hold the baby in their lap for feeding and which causes them to attain faulty posture such as sitting unsupported and prolonged neck bending which implies increase in the work of muscles and ligaments causing abnormal stress and tension in posterior cervical structures leading to myofascial pain.

Among all the participants 53% women were homemakers and rest 47% were working. Both the population showed forward head posture. Similar findings of forward head posture in breastfeeding postpartum women were seen in a study done by Kelly Patrícia Medeiros Falcão et al.^[3] In our study working population exhibited smaller craniovertebral angle as compared to homemakers which means that greater degree of forward head posture along with pain was seen in working women. This might be due to the postures they acquire while working as many of them had a desk job. The undue stress on muscles

both while working and caring for the baby leads to not only pain but also disability in women which affects their day to day living ability.

Results of the present study showed that there is high degree of correlation between NDI and NPRS ($r = 0.9072$, $p = <0.0001$) and moderate degree of correlation between NPRS and CVA ($r = -0.3643$, $p = 0.0036$) and weak correlation between NDI and CVA ($r = -0.1868$, $p = 0.0730$). NPRS was positively correlated with NDI i.e. the higher the neck pain more is the disability and this was consistent with our hypothesis. NPRS was negatively correlated with CVA which states that the smaller the CV angle the higher the NPRS score and vice versa.

One study conducted by Niharika S. Chungade et al found that the most frequent site of pain after lower back was neck pain in postpartum women after 6 weeks of childbirth to one year and this finding is supporting our study.^[10]

The finding that NDI and NPRS are positively correlated and CVA and NPRS are negatively correlated is consistent with a previous study done by Chris Ho Ting Yip et al.^[7] As pain intensity is one of the dimensions of NDI a positive correlation a positive correlation between NDI and NPRS would be expected. In the similar study they found out that age was positively correlated with NPRS i.e. the older the subject, the more pain they suffered. Our study, however, did not confirm these findings, which may indicate that irrespective of the age, women 6 months post delivery may suffer with pain due to emotional and ergonomic stress of caring for the new born. Our study however found a high to moderate degree of correlation between neck pain, disability and head posture therefore we suggest women should be made aware of these changes and the effect it has on their physical and mental health. Postural correction exercises and re education should be considered as an integral part of prevention and management of neck pain and disability in these women.

CONCLUSION

Relationship between neck pain, disability and head posture was assessed using Numerical Pain Rating Scale, Neck Disability Index and Craniovertebral Angle, respectively and it can be concluded that women with small craniovertebral angle have a greater forward head posture, and the greater the forward head posture the greater is the pain and disability.

Clinical Implications

Education, prevention and management of injury along with postural correction exercises should be the main concern.

It is important to take into consideration the issues women might face even after postpartum period by assessing pain and posture of their entire body.

Ergonomic advice while breast feeding, nappy changing and maneuvering the baby can improve the ability and functional status of women.

Abbreviations

NDI: Neck Disability Index

NPRS: Numerical Pain Rating Scale

CVA: Craniovertebral Angle

MB ruler: Marcus Brader ruler

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Conflict of Interest: None

Ethical Approval: Approved

REFERENCES

1. Mantle J, Haslam J, Barton S. Physiotherapy in obstetrics and gynaecology. Elsevier Health Sciences; 2019 Apr 8.

2. Gartner LM, Morton J, Lawrence RA, Naylor AJ, O'Hare D, Schanler RJ, Eidelman AI. Breastfeeding and the use of human milk. *Pediatrics*. 2005 Feb 1;115(2):496-506.
3. Medeiros KP, Freire de Carvalho AC, Miranda de Luna AC, Gonçalves A, Barros JD, Braga R. Prevalence of postural changes on puerperals during breastfeeding position. *J Nurs UFPE Line*. 2015;9(11):9839-45.
4. World Health Organization. Global nutrition targets 2025: breastfeeding policy brief. World Health Organization; 2014.
5. Santhosh BM, Malavika MD. Exploration in to the Ergonomics of Sitting Posture of Lactating Mothers.
6. Rani S, Habiba UE, Qazi WA, Tassadaq N. Association of breastfeeding positioning with musculoskeletal pain in postpartum mothers of Rawalpindi and Islamabad. *JPMA*. 2019 Apr;69:564-6.
7. Yip CH, Chiu TT, Poon AT. The relationship between head posture and severity and disability of patients with neck pain. *Manual therapy*. 2008 Apr 1;13(2):148-54.
8. Kadu DV, Shetye JV. Reliability of "MB-Ruler Software" to Measure Craniovertebral Angle Using the Photographic Method. *Journal of Health and Allied Sciences NU*. 2022 Jan 18.
9. Lee MY, Lee HY, Yong MS. Characteristics of cervical position sense in subjects with forward head posture. *Journal of physical therapy science*. 2014; 26(11):1741-3
10. Chungade NS, Mahishale A, Dalal A, Angolkar M. Musculoskeletal pain syndrome in postpartum women. *Nepal Journal of Obstetrics and Gynaecology*. 2020 Nov 15;15(2).

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