

Prevalence of Compression Neuropathies during Pregnancy

Bazal Bukhari¹, Saba Afzal¹, Mehak hamna Zahra Gilani¹, Mariam Tariq¹, Maham Nasir¹, Syed Asad Ullah Arsalan²

¹University Institute of Physical Therapy, Faculty of Allied Health Sciences, The University of Lahore, Lahore, Pakistan.

²University of Tehran, Tehran, Iran.

bazal.bukhari@uipt.uol.edu.pk

Highlights:

- Frequency of common neuropathies during pregnancy.
- Common nerves involve in neuropathies.
- Compression of sciatic and median nerves are most commonly involved during pregnancy multigravida women.

Abstract:

It is common perception that Pakistani women suffering from compression neuropathies during pregnancies which may lead to functional limitations.

Objective:

To find the frequency of common neuropathies during pregnancy, nerves commonly involved and common causes of compression neuropathies.

Methodology:

This was a cross sectional study. Duration of the study was 3 months after approval of synopsis. Convenient sampling was used. This study was conducted at private hospitals of Lahore (Iqra Medical Complex, Saira Memorial hospital and UOL teaching Hospital). Inclusion criteria were women of 30-45 years, women with symptoms of neuropathy, primigravidas and Multigravidas women were included. Exclusion criteria were women who so not fit in above age group, women having any surgical intervention before conception and having any trauma. A Performa was used for each patient, which was filled out based on their symptoms. Statistical analysis was done by using SPSS vol.17.

Results:

From the data of 35 multigravida pregnant women, compression of sciatic nerve and

involved during pregnancy in multigravida women. The compression neuropathies occur commonly in 3rd trimester of pregnancy. The increase weight during pregnancy, poor economic status and bad posture are significant causes of compression neuropathies.

Keywords:

Compression neuropathies, Perineurium, Multigravida

Introduction:

Pregnancy is the state in which a woman carries a fertilized egg inside her body. Pregnancy spans 40 weeks from conception to delivery, is divided into three trimesters, with characteristics changes during each trimester¹. Neuropathy is a focal nerve lesion produced when sustained pressure is applied to a localized portion of nerve, either from external or internal source, the main source of injury is pressure differential that exists between one portions of nerve to other.² Neuropathies during pregnancy and the postpartum period are common and are usually due to compression around pregnancy and child birth³ Causes of Compression Neuropathies during Pregnancy are weight of the foetus (Dawn and Marcus, 2009), hormonal changes, increase tissue pressure gradient⁴ circulatory compromise, fluid retention and posture⁵ Researchers have suggested six symptoms regarding pregnancy induced neuropathies which are numbness and tingling, weakness or atrophy, nocturnal numbness, Tinel's sign, Phalen's sign and two point discrimination⁶ During pregnancy hormone fluctuations, fluid shifts and musculoskeletal changes predispose women to carpal tunnel syndrome^{7,8} Occurrence in pregnancy is as high as 41%^{4,9} During third

trimester, due to increased extracellular fluid content and immunosuppression women may suffer from bell's palsy¹⁰ Due to pressure on nerve roots, on aorta and vena cava there is back pain which radiate to the legs^{11,12} In pregnant women due to the faulty posture and narrowing of neurovascular structures which pass through the thoracic outlet space, thoracic outlet syndrome occurred¹³ The assessments of physical therapists during compressive neuropathies are: Sensitization of peripheral nerve, active and passive movements analysis, peripheral nerve provocation tests and nerve palpation¹⁴ The significance of this study is to provide education and awareness to pregnant women regarding postural guidelines and their weight control. This study will provide evidence base practice for researchers.¹⁵ Study background showed that neuropathies during pregnancy and the post-partum period are common and are usually due to compression around pregnancy and child birth. Taking into account the increase risk to develop neuropathies during pregnancy in my clinical practice, I decided to conduct a research regarding pregnancy induced neuropathies. The rationale of this study was that I want to explore the prevalence of pregnancy related neuropathies and which one is most common neuropathy among pregnant women. I selected this population as there were more incidences of neuropathies in pregnancy due to bad posture and other pregnancy related causes. The objective of the research was to determine the frequency of common neuropathies during pregnancy, nerve commonly involved, dominant causes of neuropathies and in which trimester of pregnancy neuropathy is common.

Methodology:

Study design was observational (cross sectional). This study was done in all Private hospitals Lahore (gynaecological unit) for 3 months after approval of synopsis. A convenient sampling technique was used during study. The sample size was 35 patients. Inclusion criteria was women of 30-45 years, women with symptoms of

neuropathy, primigravidas and Multigravidas women were included. Exclusion criteria were women who so not fit in above age group, women having any surgical intervention before conception and having any trauma. The permission was taken from Private hospitals Lahore to conduct this study. All the participants were included in this study on the basis of inclusion criteria after taking consent from them. 35 women participants filled the form who met the criteria. Data was collected from each participant through questionnaire. Statistical analysis was done by using SPSS vol.17 (statistical pattern for social sciences). The continuous variables were expressed as mean \pm S.D. whereas categorical variable will be expressed in the form of frequency table and percentages.

Results:

The women have mild muscle weakness was 40.0%, 45.71% have moderate muscle weakness and 14.28% have severe muscle weakness. The mild function loss was present in 71.42% women and moderate muscle weakness present in 28.57%. (Table 1)

Motor system	Mild	Moderate	Severe	Total
Muscle weakness	14 (40.0%)	16 (45.71%)	5 (14.28%)	35 (100%)
Function Loss	25 (71.42%)	10 (28.57%)	0 (0.00%)	35 (100%)

Table 1: Frequency Distribution of Motor Symptoms in compression neuropathies among Pregnant Women (n=35) 2.9% pregnant women were in 1st trimester, in 2nd trimester 45.7% were present and 51.4% women were in 3rd trimester. (Table 2)

Trimesters of pregnancy	Frequency (%)
1st	1
2nd	16
3rd	18
Total	35

Table 2: Frequency Distribution of Trimesters among pregnant Women (n=35) 17.14% women had facial nerve involvement during pregnancy and 82.85% had no

involvement of facial nerve. Sciatic nerve involved in 45.71% women and 54.28% had no involvement. Thoracic outlet syndrome persisted in 22.85% women and 77.14% had no symptoms of it. 42.85% had median nerve involvement and 57.14% had no problem of median nerve. Other nerve involved in 2.85% and 97.14% had no symptoms. (Table 3)

Nerve involvement	Yes	No	Total
Facial nerve	6(17.14%)	29(82.85%)	35(100%)
Sciatic Nerve	16(45.71%)	19(54.28%)	35(100%)
Thoracic outlet syndrome	8(22.85%)	27(77.14%)	35(100%)
Median nerve	15(42.85%)	20(57.14%)	35(100%)
Other nerve	1(2.85%)	34(97.14%)	35(100%)

Table 3: Frequency distribution of involved nerves compression among pregnant women (n=35)

The sensory signs and symptoms present in pregnant women have different frequencies. 74.28% women have pain, pares thesis present in 51.42%, numbness present in 17.14% and 5.71% women have total sensory loss. (Table 4)

Sensory symptoms	Yes	No	Total
Pain	26(74.28%)	9(25.71%)	35(100%)
Pares thesis	18(51.42%)	17(48.57%)	35(100%)
Numbness	29(82.85%)	6(17.14%)	35(100%)
Total Sensory Loss	2(5.71%)	33(94.28%)	35(100%)

Table 4: Frequency Distribution of Sensory Symptoms included in compression neuropathies among Pregnant Women (n=35)

Discussion:

The present study was carried out to see various factors i.e. the frequency of compression neuropathies in pregnant women, the most common nerve involved, in which trimester compression of nerve commonly occurs and physiotherapy management of such women. In pregnant women, a number of symptoms occur who have nerve compression like pain,

numbness, and paraesthesia and limited daily activities. The posture and weight gain have a significant contribution in compressing the nerve. The symptoms occur in those areas, in which the nerve involved. The increased fluid content during pregnancy inserts pressure on nerve root. In research, multigravida women are taken who faced problems during their pregnancy. Commonly median or sciatic nerves are involved which cause symptoms in hand, in lumbar or in back of leg¹⁶. The present research showed results almost similar to the work conducted by Klein in 2013¹⁷. He concluded that neuropathies during pregnancy and the post-partum period are common and are usually due to compression around pregnancy and child birth. Most common peripheral neuropathies are Bell's palsy, Carpel tunnel syndrome and lower extremity neuropathies. The present research represented that compression neuropathies are most commonly occurring in 3rd trimester of pregnancy. Osterman et al., in 2012 also concluded that in pregnant women bilateral symptoms of carpel tunnel syndrome are common in 3rd trimester of pregnancy¹⁸. One more research's results match with this research's results. Kovo et al., in 2009 concluded that bilateral facial paralysis is to be more frequent during 3rd trimester of pregnancy and in early puerperium¹⁹. The main causes of compression neuropathies were bad posture, water retention, weight gain etc. Proisy et al., also concluded the same results that compression neuropathies occur more commonly during pregnancy because of changes in water retention, weight and bad posture.²⁰

Conclusions:

The result of this study showed that median and sciatic nerves are most common nerves involved during pregnancy in multigravida women. The compression neuropathies occur commonly in 3rd trimester of pregnancy. The increase weight during pregnancy (above 55 kg), poor economic status and bad posture are significant causes of compression neuropathies.

References:

- 01- Gold RB. The implications of defining when a woman is pregnant. *The Guttmacher Report on Public Policy*. 2005;8(2):7-10.
- 02- Khosrawi S, Maghrouri RJAbr. The prevalence and severity of carpal tunnel syndrome during pregnancy. 2012;1.
- 03- Padua L, Pasquale AD, Pazzaglia C, Liotta GA, Librante A, Mondelli M. Systematic review of pregnancy-related carpal tunnel syndrome. *Muscle & nerve*. 2010;42(5):697-702.
- 04- Ablove RH, Ablove TS. Prevalence of carpal tunnel syndrome in pregnant women. *Wisconsin Medical Journal (WMJ)*. 2009;108(4):194.
- 05- Chou R, Qaseem A, Snow V, Casey D, Cross JT, Shekelle P, et al. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. *Annals of internal medicine*. 2007;147(7):478-91.
- 06- Baron R, Binder A, Wasner G. Neuropathic pain: diagnosis, pathophysiological mechanisms, and treatment. *The Lancet Neurology*. 2010;9(8):807-19.
- 07- Borg-Stein J, Dugan SA, Gruber JJAjopm, rehabilitation. *Musculoskeletal aspects of pregnancy*. 2005;84(3):180-92.
- 08- Gerritsen AA, de Krom MC, Struijs MA, Scholten RJ, de Vet HC, Bouter LM. Conservative treatment options for carpal tunnel syndrome: a systematic review of randomised controlled trials. *Journal of neurology*. 2002;249(3):272-80.
- 09- Ablove RH, Ablove TSJWMJ. Prevalence of carpal tunnel syndrome in pregnant women. 2009;108(4):194.
- 10- Vrabec JT, Isaacson B, Van Hook JW. Bell's palsy and pregnancy. *Otolaryngology-Head and Neck Surgery*. 2007;137(6):858-61.
- 11- Hoy D, Bain C, Williams G, March L, Brooks P, Blyth F, et al. A systematic review of the global prevalence of low back pain. *Arthritis & Rheumatology*. 2012;64(6):2028-37.
- 12- Sax TW, Rosenbaum RBJM, Medicine NOJotAAoE. Neuromuscular disorders in pregnancy. 2006;34(5):559-71.
- 13- Novak CB. Upper extremity work-related musculoskeletal disorders: a treatment perspective. *Journal of orthopaedic & sports physical therapy*. 2004;34(10):628-37.
- 14- Nee RJ, Butler D. Management of peripheral neuropathic pain: integrating neurobiology, neurodynamics, and clinical evidence. *Physical Therapy in Sport*. 2006;7(1):36-49.
- 15- Borg-Stein J, Dugan SAJPM, America rcoN. Musculoskeletal disorders of pregnancy, delivery and postpartum. 2007;18(3):459-76.
- 16- Sax TW, Rosenbaum RB. Neuromuscular disorders in pregnancy. *Muscle & nerve*. 2006;34(5):559-71.
- 17- Klein A. Peripheral nerve disease in pregnancy. *Clinical obstetrics and gynecology*. 2013;56(2):382-8.
- 18- Osterman M, Ilyas AM, Matzon JL. Carpal tunnel syndrome in pregnancy. *Orthopedic Clinics*. 2012;43(4):515-20.
- 19- Kovo M, Sagi Y, Lampl Y, Golan A. Simultaneous bilateral Bell's palsy during pregnancy. *The Journal of Maternal-Fetal & Neonatal Medicine*. 2009;22(12):1211-3.

- 20- Proisy M, Rouil A, Raoult H, Rozel C, Guggenbuhl P, Jacob D, et al. Imaging of musculoskeletal disorders related to pregnancy. *American Journal of Roentgenology*. 2014;202(4):828-38.