# Investigation of the effect of methylprednisolone on neck pain


## Abstract

**Background:** Chronic Neck pain (NP) is one of the most common problems. Therefore, the present study was conducted with an aim Investigation of the effect of prednisolone on NP.

**Methods:** In this clinical trial, with 46 patients for the experimental group and 43 patients were analyzed for the control group. The method of selecting individuals in both groups was sequentially, thus all eligible individuals were selected to complete the sample size required. The statistical population of patients with NP was referred to clinics, hospitals and specialist doctors. Data were collected using the VAS pain scale, which was in the range of zero-10, before and after the intervention and analyzed using SPSS16 software.

**Result:** The results showed that the M (SD) pain score before the intervention in the control group was 7.32±0.47 and in the experimental group was 7.20±0.41(P=0.21, F=6.27). After drug treatment with methylprednisolone in 3 days after M (SD) intervention the pain of patients in the experimental group decreased to 5.50±0.88, in 6 days to 3.60±0.53 and in 9 days to 3.26±0.68(P=0.000).

**Conclusions:** Due to the positive effect of methylprednisolone on reducing pain in patients with NP, the use of this drug is recommended to reduce pain in these patients.



**Keywords:** Prednisolone, neck pain, Methylprednisolone

## 1. Background

Musculoskeletal disorders are said to have any tissue damage in the musculoskeletal and neurological system that disrupts the function of the organs. Today, in various societies, especially developing and industrialized countries, Musculoskeletal Disorders (MSDs) has been increased and has become a problem affecting the health of the body and soul (1, 2). MSDs incurs direct (in order to diagnose and treat them) and indirect costs (due to absence from work and loss of specialized personnel at work) (3, 4). At present, the control and reduction of MSDs among individuals is one of the most important problems of the relevant professionals, and this is so important that in many countries, MSDS prevention has been considered as one of the national priorities (5). MSDs can lead to waist conflict, cervical spine and upper organs and lead to individual disability (6).

Chronic Neck pain (NP) is one of the most common problems and, due to lack of information in its pathophysiology, the relevant specialist is more effort to provide the necessary solutions to reduce its pain and help improve the general status of patients (7). NP is defined as pain in the neck that is with or without referral to the upper limb and lasts for at least one day (8). This disease, the second disability of people in their lifetime, experiences about 60- 80% of NP and this rate is reported to be about 30- 50% of the general population (9, 10).NP pain and discomfort caused many restrictions and is one of the main causes of job absences (11).

When a person is in the wrong position for a long time and works with the head bent forward, the anti-gravity muscle group of the person is stretched and tired. As a result, the weakness of the back muscles of dullness and disruption in the practice of deep sensory messages occurred and leads to disruption in the neck muscle tuning reflexes. Following this disorder, the patient has a decrease in strength, endurance, efficiency and their magnitude (12, 13,25). The type of pain is divided into two acute and chronic symptoms based on the prevalence of symptoms. In acute, short-term symptoms are resolved, while in the

chronic type of symptoms remain more than 12 weeks, and the patient has recurrence and recovery periods. Despite the complete health in the central nervous system in MSDs, motion control strategies for these patients suffer from harm and changes that lead to pain in patients (14, 15).

The prevalence of NP has been reported in significant studies, so that in the study of Shirin et al in Zanjan (Iran), the prevalence of NP was performed in 110 dentists, its rate (16) 20.8% and in the study of Jalili Nasab et al., in the dental group of Qazvin, 62% (17) was reported. Also, in the study of Sachdev et al, 69% (18) and in the Kashif et al in Pakistan were reported 66% (18), which is essential in this regard due to the high prevalence of reported pain necessary interventions.

## 2. Objectives

Considering the importance of patients 'health, especially patients with NP in this study, pulse methylprednisolone was investigated to patients with NP injection and its effects on patients' pain status.

## 3. Methods

In this clinical trial, 106 patients were included in the study, of which 53 patients in the recipient group of methylprednisolone 500 mg were intravenous and 53 patients in the placebo group. Injected for the patient, the vessel was taken and the drugs were given to the patient under respiratory cardiac monitoring. In the research flow, up to 7 patients from the experimental group and 9 patients were removed from the control group, with 46 patients for the experimental group and 43 patients were analyzed for the control group.

The method of selecting individuals in both groups was sequentially, thus all eligible individuals were selected to complete the sample size required. The statistical population of patients with NP was referred to clinics, hospitals and specialist doctors. Patients who had informed consent to study were at least 3 months old, aged between 18 and 65 years, had NP confirmed by a neurosurgeon, and had a left or right unilateral disc with radicular pain in the

same direction. They entered the study. Also, patients undergoing any other intervention, patients with diabetes, patients with nerve defects, patients require action, torn neck disk, myelopathy, published pain toward both of the study. Demographic information and pain intensity were recorded at different injections obtained in the information sheets beforehand. Data were collected using the VAS pain scale, which was in the range of zero-10, (19) before and after the intervention and analyzed using SPSS16 software.

## 4. Results

The results showed that in the experimental group, the M(SD) age of patients was 55.60(8.34), And about the findings reported with the number(N) and percentage (%) was shown that 35(76.1%) From patient's female and 11(23.9%) males, 31(67.4%) From patient's married and 15(32.6%) unmarried (for various reasons including non-marriage, divorce, death of spouse), 32(69.6%) From patient's had poor economic status and 14(30.4%) had good economic status. In relation to the control group, it was also shown that the M(SD) age of patients was 58.93(7.63), And about the findings reported with the number(N) and percentage (%) was shown that 31(72.1%) From patient's female and 12(27.9%) males, 28(65.1%) From patient's married and 15(34.9%) unmarried (for various reasons including non-marriage, divorce, death of spouse), 31(72.1%) From patient's had poor economic status and 12(27.9%) had good economic status. also, there was no statistical difference between the experimental and control groups in all variables($p>0.05$).



**Table1-Comparison of NP scores in the evaluated groups**

| pain | Control Group | Experimental Group | P, F |
|---|---|---|---|
| | M ± SD | M ± SD | |
| **pre intervention** | 7.20±0.41 | 7.32±0.47 | P=0.21, F=6.27 |
| **After 3 days** | 7.04±0.68 | 5.50±0.88 | P=0.000, F=7.73 |
| **After 6 days** | 6.74±0.95 | 3.60±0.53 | P=0.000, F=15.95 |
| **After 9 days** | 6.74±1.04 | 3.26±0.68 | P=0.000, F=6.53 |

The results showed that the M (SD) pain score before the intervention in the control group was 7.32±0.47 and in the experimental group was 7.20±0.41(P=0.21, F=6.27). After drug treatment with methylprednisolone in 3 days after M (SD) intervention the pain of patients in the experimental group decreased to 5.50±0.88, in 6 days to 3.60±0.53 and in 9 days to 3.26±0.68(Table 1).

## 5. Discussion

According to the findings, methylprednisolone 500 mg STAT in serum reduced pain in patients with NP. In a study by Salehi et al., which topical methylprednisolone was injected to treat De Quervain's Tenosynovitis, 72 patients referred to an orthopedic clinic were included in the study and showed that the mean pain intensity in the methylprednisolone and lidocaine topical injection group was splinted. There was only a significant difference compared to topical treatment (20).Also, in the study of Hadianfar et al., in which 25 patients with neck headache were evaluated with methylprednisolone, it was shown that after injection of the drug, the severity of patients' pain, the number of headache attacks one month and three months after injection had decreased (21).

In this study, that methyl prednisolone was injected into patients with NP injected, patients with post-injection patients have decreased with the findings of other studies.

In the study of Saadat aimed at the effect of local injection of bupivacainin and triumcinolone on shoulder pain in patients with cerebral events, patients were given in the first week, the sixth week and the twelfth week to patients with triamcinolone, which could lead to reduced pain of patients Create (22).In the study of Mehr et al. that patients with radicular lower extremity were derived from disk exhaust, with angioconte number 20, a peripheral intravenous pathway, and the serum crystalloid 500 mg of start and cardiac monitoring were performed.The results showed that injection of steroid epidural into the epidural space significantly reduced patients' pain (23).Also, in a study of Imani et al patients which had at least 3 months of lower limb pain, two corticosteroid and dexmedetomidine drugs were injected, both of which had a significant reduction in pain after injection (24).

Being new of this study is the strength of this study, which can be an idea for other studies in other Iranian cities. Also, the lack of cooperation of patients was one of the restrictions of the present study, which was attempted by explaining the research objectives.

## 5.1 Conclusions

Due to the positive effect of methylprednisolone on reducing pain in patients with NP, the use of this drug is recommended to reduce pain in these patients.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

**Ethical Approval and Consent :**

Ethical criteria in research include informed consent to participate in the study, maintaining confidentiality and confidentiality of information, voluntary participation in the study, all visits are free for patients, history of disease affecting pain and also obtaining an ethics code to IR.MEDILAM.REC.1400.118.

## Reference:


1. Miri M, Hashemizade H, Mohammadpour A, Zaheri HJThoms. Effect of one period of exercise-therapy and an engonomic intervention on the rate of chronic neck pain and disability in computer users. The horizon of medical sciences. 2015;21(3):197-203.

2. Tinubu BMS, Mbada CE, Oyeyemi AL, Fabunmi AA. Work-Related Musculoskeletal Disorders among Nurses in Ibadan, South-west Nigeria: a cross-sectional survey. BMC Musculoskeletal Disorders. 2010;11(1):12, https://doi.org/0.1186/471-2474-11-12.

3. Akrouf Q, Crawford J, Al Shatti A, Kamel MJE-EMHJ, 16 , 94-100,. Musculoskeletal disorders among bank office workers in Kuwait. EMHJ-Eastern Mediterranean Health Journal. 2010:16 (1), 94-100, 2010 https://apps.who.int/iris/handle/10665/117824.

4. Omid A, Gholamreza P, Mohammad S. One year study of musculoskeletal disorders and their relation to occupational stress among office workers: a brief report %J Tehran University Medical Journal. Tehran Univ Med J. 2012;70(3):194-9.

5. رsalari h, Enjavi SMR, Ghassemzadeh s. %J occupational hygene and health promotion journal. Occupational Hygiene and Health Promotion 2020;3(4):378-88.

6. KARAMI M, EZABADI SG, KARAMI Z, SAHRANAVARD YJOH, Promotion H. Determining the prevalence of musculoskeletal injuries and its relationship with workplace posture in copper industry repairmen. Occupational Hygiene and Health Promotion. 2021.

7. Röijezon U, Björklund M, Bergenheim M, Djupsjöbacka MJJon, rehabilitation. A novel method for neck coordination exercise–a pilot study on persons with chronic non-specific neck pain. 2008;5(1):1-10, https://doi.org/.1186/743-0003-5-36.

8. Hoy D, March L, Woolf A, Blyth F, Brooks P, Smith E, et al. The global burden of neck pain: estimates from the global burden of disease 2010 study. Annals of the rheumatic diseases 2014;73(7):1309-15.

9. Nusser M, Knapp S, Kramer M, Krischak GJJorm. Effects of virtual reality-based neck-specific sensorimotor training in patients with chronic neck pain: A randomized controlled pilot trial. journal of rehabilitation medicine. 2021;53(2):jrm00151, doi: 10.2340/16501977-2786.

10. Fejer R, Kyvik KO, Hartvigsen JJEsj. The prevalence of neck pain in the world population: a systematic critical review of the literature. European spine journal. 2006;15(6):834-48, https://doi.org/10.1007/s00586-004-0864-4.

11. Hoboubi N, Choobineh A, Keshavarzi S, kamari ghanavati F, Khalife M. Investigating the effects of work-related psycho-social factors on neck disorders among office personal of Shiraz University of Medical Science %J Iran Occupational Health Journal. IOH Journal 2016;13(1):91-8.

12. Javdaneh N, Hadadnezhad MJJSPIP. Comparison of the Effect of Stability Training and Muscle Energy Technique on Pain, Disability and Neck Range of Motion in People with Chronic Neck Pain. J Saf Promot Inj Prev. 2019;7(2):7(2):78-87.

13. Côté P, Cassidy JD, Carroll LJ, Kristman VJP. The annual incidence and course of neck pain in the general population: a population-based cohort study. Pain. 2004;112(3):267-73, https://doi.org/10.1016/j.pain.2004.09.004.

14. Amiri Arimi S, Abdollahi I, Mohseni-Bandpei MA. Effects of Chronic Mechanical Neck Pain on Motor Control of Cervical Muscles: A Systematic Review %J Journal of Mazandaran University of Medical Sciences. J Mazandaran Univ Med Sci. 2016;26(136):211-24.

15. Hodges PWJJoE, Kinesiology. Pain and motor control: from the laboratory to rehabilitation. Journal of Electromyography and Kinesiology. 2011;21(2):220-8.

16. Shirinbak I, Basir shabestari s, sefidi f. Prevalence of Musculoskeletal pain and its Related Factors among Zanjan dentists %J journal of research in dental sciences. 2018;15(1):42-8.

17. jalili nasab A, azmoodeh F, alipour M, ansari S, varmazyar S. Investigation the prevalence of musculoskeletal disorders and its related factors in general dentists of Qazvin in 2016 %J journal of research in dental sciences. J Res Dent Sci. 2018;14(4):220-7.

18. Sachdev S, Talreja S, Nasir S, Ali AAJJoNP, Rehabilitation P. Prevalence of neck pain among the undergraduate physical therapy students of university of Balochistan, Quetta, Pakistan. 2021;8(1):020-3.

19. Zub LW, Szymczyk M, Pokryszko-Dragan A, Bilińska MJACEM. Evaluation of pain in patients with lumbar disc surgery using VAS scale and quantitative sensory testing. 2013;22(3):411-9.

20. Salehi S, Dehghan M, Sherafat AJSJ. The Efficacy of Local Injection of Methylprednisolone and Lidocaine with and Without Splint, in Treating Patients with De Quervain's Tenosynovitis. SSU_Journals 2012;19(6):807-13.

21. Hadianfard M, Rahimi Jaberi A, Kazemilar S. The Effect of Methylprednisolone Acetate Injection at Cervical Trigger Points in both Chronic and Drug Resistant Headache %J Armaghane danesh. 2011;16(2):111-9.

22. Niaki AS, Momenzadeh S, Mohammadinasab H, Ghahramani M, Nayebaghaie H, Ommi DJTUMJ. Evaluating the effects of local injections of bupivacaine and triamcinolone acetate on shoulder joint pain and restricted range of motion following cerebrovascular accidents. Tehran University Medical Journal. 2011;69(6):Issue 6, p381-7. 7p.

23. Mir M, Alijanpour E, Sharifpour S, Seyfi SJA, Pain. Comparison the effect of epidural steroid injection by Caudal and Lumbar methods for controlling the radicular pain of lower extremity. 2021;12(1):68-77.

24. IMANI F, ALEBOUYEH M, ENTEZARI S, ZAFARGHANDI M, KHALEGHIPOUR M, NOGHREKAR A. TRANSFORAMINAL EPIDURAL BLOCK WITH DEXMEDETOMIDINE VS. CORTICOSTEROID IN PATIENTS WITH CHRONIC RADICULAR LOW BACK PAIN: A NEW CHALLENGE. 2015.

25. Ghasemi, M., Masaeli, A., Rezvani, M., Shaygannejad, V., Golabchi, K., & Norouzi, R. (2013). Oral prednisolone in the treatment of cervical radiculopathy: A randomized placebo controlled trial. Journal of research in medical sciences: the official journal of Isfahan University of Medical Sciences, 18(Suppl 1), S43–S46