

Research Paper

The Effect of Static Magnet Therapy on Pain-Free Shoulder Passive Range of Motion in Patients with Shoulder Subluxation after Stroke: A Randomized Clinical Trial

Shima Shirozhan¹ , Asghar Dalvandi^{2,*} , MohammadAli Hosseini³ ,
Mahdieh Sedighi Pashaki⁴ , Seyed Ahmad Raeissadat⁵ , Mahdi Rahgozar⁶ 

¹ Ph.D. Student, Department of Nursing, University of Social Welfare and Rehabilitation Sciences (USWR), Tehran, Iran

² Associate Professor, Department of Nursing, Islamic Azad University, Tehran Medical Branch and University of Social Welfare and Rehabilitation Sciences (USWR), Tehran, Iran

³ Associate Professor, Department of Nursing, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

⁴ Master of Rehabilitation Nursing, Imam Khomeini Hospital Complex, Tehran, Iran

⁵ Associate Professor, Clinical Development Research Center of Shahid Modarres Hospital, Physical Medicine and Rehabilitation Research Center and Department, Shahid Beheshti University of Medical Sciences, Tehran, Iran

⁶ Associate Professor, Department of Statistics, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

* **Corresponding author:** Asghar Dalvandi, Associate Professor, Department of Nursing, Islamic Azad University, Tehran Medical Branch and University of Social Welfare and Rehabilitation Sciences (USWR), Tehran, Iran. E-mail: asghar.dalvandi@gmail.com

How to Cite this Article:

Shirozhan S, Dalvandi A, Hosseini MA, Sedighi Pashaki M, Raeissadat SA, Rahgozar M. The Effect of Static Magnet Therapy on Pain-Free Shoulder Passive Range of Motion in Patients with Shoulder Subluxation after Stroke: A Randomized Clinical Trial. *Iranian Journal of Rehabilitation Research in Nursing*. 2021;7(3):1-9.

DOI: [10.52547/ijrn-07031](https://doi.org/10.52547/ijrn-07031)

Received: 24 Nov 2020

Accepted: 23 Feb 2021

Keywords:

Magnet Therapy
Shoulder Subluxation
Complementary and Alternative
Medicine
Shoulder Pain

© 2021 Iranian Journal of
Rehabilitation Research in Nursing

Abstract

Introduction: One of the stroke complications is hemiplegia, which can cause subluxation of the shoulder joint and reduce the passive range of motion of the affected shoulder, resulting in limited movement. This study aimed to evaluate the effect of static magnet therapy on pain-free shoulder passive range of motion in patients with shoulder subluxation after stroke.

Methods: This clinical trial study was performed on 36 patients with stroke (18 in the intervention group and 18 in the control group) referred to Tabassum Stroke Rehabilitation Center in Tehran in 2016. Neodymium magnetic shoulder support with an intensity of 1500 gauss was used in the intervention group, and non-magnetic shoulder support was used for the control group. A goniometer measured Pain-free passive range of motion (abduction) of the (shoulder with subluxation) under the supervision of an occupational therapist. Data were analyzed using SPSS software version 18 using descriptive and inferential statistical tests. The significance level was considered 0.05.

Results: After magnet therapy, the mean score of range of motion in the intervention group increased significantly (0.023). Post-test comparison between the intervention and control groups showed that the mean score of range of motion was higher in the intervention group, but this difference was not statistically significant.

Conclusions: Magnet therapy as a complementary, low-cost, and safe treatment with an increasing range of motion without shoulder pain can help improve individual activities and prevent complications. Further studies on the effectiveness of magnet therapy in improving the range of motion are recommended.

Extended Abstract

OBJECTIVE

Stroke is a global burden on health care systems and one of the leading causes of disability in adults. It has been estimated that the incidence of post-stroke complications is 40-96%. Many of these complications

can be prevented and treated if diagnosed early (1, 7). One of the most common complications after a stroke is hemiplegia, which can cause subluxation and shoulder pain. Pain can lead to shoulder dysfunction, which can

prevent rehabilitation. Several interventions alleviate shoulder pain, although conflicting reports are about their effectiveness (5, 6). Despite extensive development in medical treatment, people's interest in complementary and alternative medicine has risen. Magnet therapy is one of the complementary medical interventions that effectively treat pain, muscle stiffness, and wound healing. Given the current statistics on the prevalence of stroke and its debilitating effects that delay the rehabilitation process, the need to use safe and affordable interventions is now more apparent (10, 11, 16, 18, 20). This study evaluates the impact of magnet therapy on pain-free shoulder passive range of motion in hemiplegic patients after a stroke by focusing on complementary and alternative medicine, which is an essential part of rehabilitation nursing.

MATERIALS AND METHODS

The present study is a quasi-experimental clinical trial with a control group and a single-blind pre-and post-test design. After estimating the sample size by formula, 36 patients with stroke referred to Tabassom stroke Rehabilitation Center in Tehran in 2016 were included. They were randomly divided into intervention ($n = 18$) and control ($n = 18$) groups. Inclusion criteria were as follow: hemiplegia due to stroke, shoulder pain caused by subluxation, and functional impairment of the affected side, at least three months and a maximum of one year after stroke, not having a pacemaker, and ability to proper communication. Patients who were reluctant

to participate were excluded from the study. Neodymium magnetic shoulder support with the intensity of 1500 Gauss was used in the intervention group and non-magnetic shoulder support in the control group for 48 hours. Pain-free passive range of motion (abduction) in the shoulder with subluxation measured by a goniometer under the supervision of the occupational therapist. Data were analyzed using SPSS 18 software and descriptive and analytical statistics. The significance level was considered 0.05.

RESULTS

The results showed that the mean age of the intervention group was 65.33 ± 14.49 years and the mean age of the control group was 61.61 ± 8.13 years. The majority of samples in the intervention group (66.7%) were women, and in the control group were men (66.7%), and the other demographic characteristics of groups were the same. Before the intervention, there was no significant difference in the mean score of shoulder range of motion between the two groups ($P = 0.760$). After the intervention, the difference between the mean score in the pre-test and post-test was significant in the intervention group but was not effective in the control group. Analysis of data after the intervention using an independent t-test showed that the mean score of shoulder range of motion in the intervention group was higher than the control group. Still, this difference was not statistically significant (Table 1).

Table 1. Comparison of Mean and Standard Deviation of Range of Motion in the Two Groups of Intervention and Control in the Pre-Test and Post-Test

Group	Pre Test		Post Test		Dependent T-Test
	Mean Score	Standard Deviation	Mean Score	Standard Deviation	
Intervention	67.5	31.77	78.05	42.63	$P=0.023$, $T=-2.502$ $P=0.651$, $t=0.461$
Control	64.16	33.22	63.61	33.64	
Independent T-test	$P=0.760$, $T= -0.308$		$P=0.225$, $T= -0.236$		

CONCLUSION

This study aimed to investigate the effect of static magnet therapy as a safe complementary and alternative medical intervention on pain-free shoulder passive range of motion in post-stroke hemiplegic patients. The results of the current study were consistent with the idea that magnet therapy can increase pain-free passive range of motion, but this effect was statistically significant only in comparison between mean scores of pre-test and post-test in the intervention group. Studies on the effects of magnet therapy on pain-free passive range of motion improvement are limited, and there are conflicting results regarding the effects of magnet therapy. Further studies with a larger sample size are recommended to confirm the effect of magnet therapy on pain-free passive range of motion. Magnet therapy as a low-cost, safe and affordable intervention is an outstanding choice to enhance rehabilitation outcomes.

Ethical Considerations

In this study, 26 codes of ethics are considered. Research has also been submitted to the Ethics Committee of the University of Social Welfare and Rehabilitation Sciences and has received a code of ethics (IR.USWR.REC.1395.302).

Funding or Supports

This research was not sponsored and was conducted at personal expense.

Author's Contributions

Dalvandi and Hosseini, and Raeissadat designed the study. Shirozhan performed the measurements, Dalvandi was involved in planning and supervised the work. Shirozhan and Rahgozar processed the experimental data and performed the analysis. Shirozhan and Sedighi drafted the manuscript and designed the figures. All authors discussed the results and commented on the manuscript.

Conflict of Interest

The authors acknowledge that there is no conflict of interest in this study.

Applicable Remarks

Magnet therapy is a low-cost, safe and affordable intervention for hemiplegic post-stroke patients suffering from painful shoulder subluxation. It should be considered an outstanding choice to enhance rehabilitation outcomes.

Acknowledgment

This research results from a part of the dissertation approved by the University of Social Welfare and Rehabilitation Sciences, which is registered in the Clinical Trials Center with the code (IR.USWR.REC.1395.302). The researchers express their gratitude to the University of Social Welfare and Rehabilitation Sciences, Tabassum Stroke Rehabilitation Center, and all patients with stroke participating in this study.