

EFFECT OF ULTRASOUND WITH ISOMETRIC EXERCISE VERSUS EFFECT OF ACUPUNCTURE WITH ISOMETRIC EXERCISE FOR THE NECK PAIN AMONGST THE COLLEGE STUDENTS. – A COMPARATIVE STUDY

Physiotherapy

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ABSTRACT

Background: Neck pain is one of the most common and painful musculoskeletal conditions. For the majority of the neck disorders there is an absence of an identifiable underlying disease or abnormal structure. The ultrasound improve blood flow and accelerate healing. The acupuncture treatment process is the insertion of needles at specific points into the body of patients. Isometric exercises are a type of strength training in which the joint angle and muscle length do not change during contraction.

Aim And Objectives

Aim: To compare the effectiveness of Ultrasound versus Acupuncture keeping Isometric exercises common for both for reducing the neck pain amongst the college students.

Objectives:

To find the effectiveness of Ultrasound with Isometric exercises on neck pain amongst the college students.

To find the effectiveness of Acupuncture with Isometric exercises on neck pain amongst the college students.

To find the difference in the effectiveness of Ultrasound and Acupuncture, keeping isometric exercises common for both, on neck pain amongst the college students.

Method: In a 3-week intervention study 30 participants divided into Group A (15) and Group B (15). Group A received Acupuncture with Isometric Exercise and Group B received Ultrasound with Isometric Exercise.

Result: A significant improvement in pain, ($p < 0.05$) after the treatment was found. Greater statistical significant improvement was seen in Group B as compared to Group A.

Conclusion: The study concluded that the treatment protocol received by Group B, Ultrasound with isometric exercise is more effective in reducing pain comparing to Group A who received Acupuncture with isometric exercise.

KEYWORDS

Ultrasound, Isometric Exercise, Acupuncture, Neck Pain, College Students.

INTRODUCTION

Neck pain is the most common and painful musculoskeletal condition. For the majority of neck disorders there is an absence of an identifiable underlying disease or abnormal structure. As an outcome they are classified as non-specific. While it is often cured within a few weeks of onset, it can severely restrict routine activities, induce substantial medical consumption and result in prolonged sick leave and disability. As a casualty it stresses a huge load on individuals, employers and health care services.¹⁻⁷

Unfocused beams of ultrasound for physical therapy were the first clinical application, since the 1950s, which often has been termed as therapeutic ultrasound. This modality now typically has a base unit for generating an electrical signal a handheld transducer. Then the transducer is applied with coupling gel and moved in a circular motion over an injured or painful area of the anatomy to treat the conditions, by trained physical therapy experts. The objective is to warm the tendons muscle and other tissue to improve blood flow and accelerate healing. Ultrasound applications can also assist by promoting transport of the compound into the skin, by a method called phonophoresis.^{8,9}

The word acupuncture is derived from 2 Latin words “accus” meaning needle and “puncture” meaning to penetrate. The ancient method is the insertion of needles at specific points into the body of patients.¹⁰⁻¹¹

Isometric exercises are a type of strength training in which the joint angle and muscle length do not change during contraction. It is a form of exercise involving static contractions of muscle without any visible movement in the angle of a joint. This is clearly visible in the name, “iso” means the same with “metric” stating distance, meaning that in these exercises the length of the muscle and the angle of the joint will be the same.¹²

Need And Study

To compare the effect of acupuncture with that of ultrasound keeping isometric exercise common for both and to reach to a conclusion, that which treatment is best for the neck pain, amongst the college students.

AIM AND OBJECTIVES OF THE STUDY

AIM

To compare the effectiveness of Ultrasound versus Acupuncture

keeping Isometric exercises common for both for reducing the neck pain amongst the college students

OBJECTIVES OF THE STUDY

- To check the effectiveness of Ultrasound with Isometric exercises on neck pain amongst the college students.
- To check the effectiveness of Acupuncture with Isometric exercises on neck pain amongst the college students.
- To elicit the difference in the effectiveness of Ultrasound and Acupuncture, keeping isometric exercises common for both, on neck pain amongst the college students.

Hypothesis

Null Hypothesis

- There is no significant effect of Ultrasound keeping isometric common for both, on the neck pain amongst the college students.
- There is no significant effect of Acupuncture keeping isometric common for both, on the neck pain amongst the college students.
- There is no significant difference in the effect of Ultrasound and Acupuncture keeping isometric common for both, on the neck pain amongst the college students.

Alternative Hypothesis

- There is significant effect of Ultrasound keeping isometric common for both, on the neck pain amongst the college students.
- There is significant effect of Acupuncture keeping isometric common for both, on the neck pain amongst the college students.
- There is significant effect of Acupuncture keeping isometric common for both, on the neck pain amongst the college students.

METHODOLOGY

METHOD

Study design- A Comparative Study

Study setting- OPD- 1, Ortho Dept., Nootan College of Physiotherapy, Sankalchand Patel University, Visnagar.

Study technique- Convenience sampling

Intervention duration- 3 weeks

Criteria For Selection

Inclusion Criteria:

Age limit – College Students between the age group 18 – 25 years.

Both male and female college students.

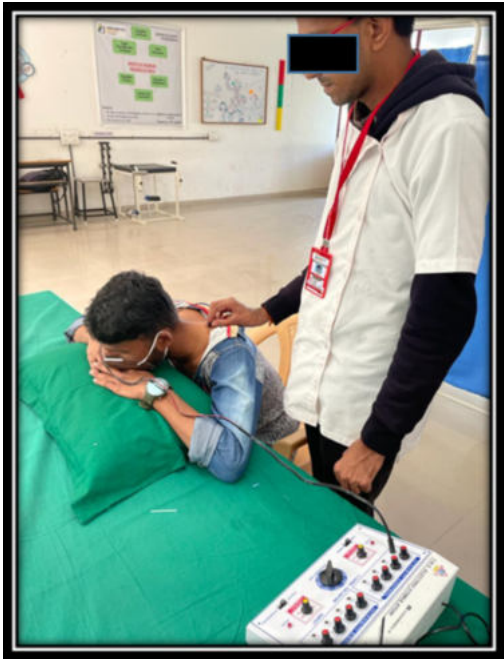
Treatment lasted for 3 weeks, having 5 sessions/week.

Exclusion Criteria:
College Students who have any other pain in addition to the neck pain.
College students having neck pain for more than 6 weeks.

Procedures of Data Collection
The participants experienced a detailed pre-evaluation. The pre-evaluation included an assessment which obtained information about demographic details, medical history, personal history, pain assessment of the participants using NPRS outcome measure. The participants were then divided into two groups i.e. Group A and Group B. Group A received Acupuncture with Isometric Exercise and Group B received Ultrasound with Isometric Exercise.



Participant Taking Ultrasound Stimulation



Participant Taking Acupuncture Stimulation

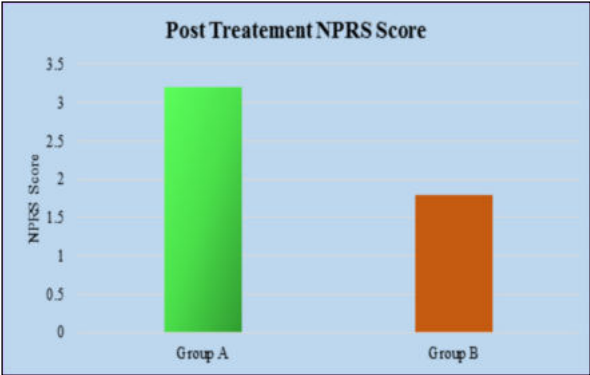
Groups	WEEK 1	WEEK 2	WEEK 3
Group B [15 Participant's]	Ultrasound Dosage – Frequency - 3 MHz Intensity – 1.2 watt/cm2 Mode – Continuous Time – 8 minutes Isometric exercises – Isometric neck flexion Isometric neck extension Isometric neck side flexion Isometric neck rotation Parameters – Each exercise is performed 5 times with 10 second hold.	Ultrasound Dosage – Frequency - 3 MHz Intensity – 1 watt/cm2 Mode – Continuous Time – 8 minutes Isometric exercises – Isometric neck flexion Isometric neck extension Isometric neck side flexion Isometric neck rotation Parameters – Each exercise is performed 5 times with 10 second hold.	Ultrasound Dosage – Frequency - 3 MHz Intensity – 0.8 watt/cm2 Mode – Continuous Time – 8 minutes Isometric exercises – Isometric neck flexion Isometric neck extension Isometric neck side flexion Isometric neck rotation Parameters – Each exercise is performed 5 times with 10 second hold.
Group A [15 Participant's]	Acupuncture treatment – 10 minutes. Isometric exercises – Isometric neck flexion Isometric neck extension Isometric neck side flexion Isometric neck rotation Parameters – Each exercise is performed 5 times with 10 second hold.	Acupuncture treatment – Rest. Isometric exercises – Isometric neck flexion Isometric neck extension Isometric neck side flexion Isometric neck rotation Parameters – Each exercise is performed 5 times with 10 second hold.	Acupuncture treatment – 10 minutes. Isometric exercises – Isometric neck flexion Isometric neck extension Isometric neck side flexion Isometric neck rotation Parameters – Each exercise is performed 5 times with 10 second hold.

Table 1 shows the treatment protocol followed.

RESULT
Table 5.1 - Intergroup Comparison Of NPRS Score After 3 Weeks

N = 30	Group A (Mean ± SD)	Group B (Mean ± SD)	F-value	p Value
NPRS Score	3.2 ± 1.08	1.8 ± 0.67	4.719	0.00

Table 5.1 Intergroup comparison of NPRS Score after 3 weeks



Graph 5.1-Intergroup comparison of NPRS Score after 3 weeks

Graph 5.1 shows intergroup comparison of NPRS after 3 weeks

statistically significant difference ($p < 0.05$) in NPRS Score was found between the Groups A and B groups after 3 weeks.

Intragroup Comparison Of Pre And Post Treatment NPRS For Group B

Outcome	Pre-Treatment		Post-Treatment		t value	p value
	Mean	SD	Mean	SD		
NPRS Score	7	± 0.84	1.8	± 0.67	18.608	0.00

DISCUSSION

The results found in this study disclosed that after a three-week treatment program, both groups, Group A, who received Acupuncture with isometric exercises and Group B who received Ultrasound with isometric exercises attained a significant improvement in reducing pain amongst the participants.

Nonspecific neck pain is defined as pain with an absence of an identifiable underlying disease or abnormal structure.

The Global Burden of Disease (GBD) 2017 reported that musculoskeletal conditions are the second highest contributors to the global disability.¹³

For both the groups, isometric exercises have been kept mandatory, because they help in increasing muscle strength and prevent re occurrence of the disorder.

Acupuncture utilization continues to increase, with over 3 million adults undergoing acupuncture every year, often for chronic pain.¹⁴⁻¹⁵

Therapeutic ultrasound applications are effective in reducing the severity of pain and sensitivity level of painful points on cervical region by increasing pain pressure threshold, furthermore it affects the functional status positively by increasing cervical range of motion.¹⁶

This study was conducted on thirty subjects with mean age of 20.43 ± 1.83 (mean $\pm$ SD). The subjects were divided into two groups.

Numerical Pain Rating Scale was used as an outcome in Group A and Group B and the results showed a significant improvement in the outcome measures in post-treatment stage as compared to the pre-treatment stage.

Though a significant improvement was found after treatment in both the groups, but Group B showed greater improvement in the NPRS Score., (p value < 0.05).

Thus the null hypothesis [H_0 1], [H_0 2], [H_0 3] is failed to accept.

The above exposed statement suggest that Ultrasound with isometric exercise is an effective combination in reducing neck pain amongst the college students.

Limitations Of The Study:

- The study involves a small sample size.

Future Recommendations Of The Study:

- Long-term follow-up can be taken

CONCLUSION

The study concluded that the treatment protocol received by Group B, Ultrasound with isometric exercise is more effective in reducing pain comparing to Group A who received Acupuncture with isometric exercise.

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