



## ICY COMFORT: EFFECTIVENESS OF CRYOTHERAPY IN MANAGEMENT OF RHEUMATOID ARTHRITIS PAIN

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### Abstract

Rheumatoid Arthritis affects an estimated 10million Indians.  $\frac{3}{4}$  of them are women. It is a long term disease that causes inflammation of joints and its surrounding tissues resulting in pain, swelling and stiffness. Currently there is no curative therapy for RA therefore patients are subjected to various lifelong adjustments and treatment modalities. Cryotherapy embraces vast varieties of uses like pain reduction, reduce swelling and promote healing. This study aimed to assess the pain level of the patients with Rheumatoid Arthritis pre and post cryotherapy. The study had adopted a quantitative approach with a quasi experimental study includes patients with RA between age group of 30 to 65yrs who visited orthopaedic centre for a period of three months. Pretest of levels of pain assessed with Mc Caffery numerical rating Scale of Pain Assessment. This test was done for 20min. Consecutive 5days of Cryotherapy was administered and post-test was done on the 6<sup>th</sup> day of pre-test. Among samples 30% were between the age group of 46-50 yrs. Out of 100%,30% were males and 70% were females.80% of patients were with 3-4 year of disease,73.3% were with 3-4year of treatment. Majority 77% of patients had pretest pain score >8, Post test pain score <3 is found for 87% of patients after cryotherapy. Thus, cryotherapy is found effective in reduction of pain in 73.3% of patients with RA. The present study assessed effectiveness of Cryotherapy in reducing pain among patients with RA. The overall findings leads to necessity to enhance education regarding the effective use of cryotherapy in pain management among patients with RA. Potential risk in Cryotherapy is minimal, it is considered to be the best technique in effective management of pain. Adequate knowledge and guidance should be imparted to the patients about cryotherapy.

**Key words:** Cryotherapy, Pain, Rheumatoid arthritis

### INTRODUCTION

Pain is a complex sensory and emotional experience that serves as a critical survival mechanisms for humans. There are various comprehensive neurophysiological mechanisms which are underlying pain perception and it has profound impact on multiple aspects of human life including physical, emotional, psychological and social well being. Understanding pain at a fundamental level is crucial for developing effective strategies for pain management and improving overall quality of life.

The experience of pain is complex, involving, emotional and cognitive components. A person in pain feels distress or suffering which affects his/her quality of life. The nurse uses a variety of intervention to bring relief. The recommended hierarchy of management should start with, nonpharmacological

treatment first then drugs if necessary and surgery as a last measure. There are various nonpharmacological methods which help to relieve the pain perception such as distraction, biofeedback, cryotherapy, hot application, music, laughter, touch therapy etc

Cryotherapy offers a promising avenue for the management of pain associated with osteoarthritis. By leveraging the therapeutic benefits of cold temperatures, cryotherapy addresses inflammation, alleviates nerve activity, and supports cartilage preservation. As a non-invasive and drug-free treatment option, it provides an accessible and effective complement to conventional OA therapies. Cryotherapy is a treatment in which the patients are exposed to extreme cold for short duration. The term "Cryotherapy" Come from Greek word Cryo means cure. The immediate effect of skin cooling and analgesia last for 5 minutes but the release of endorphins can have lasting effect, where the pains and signs of inflammation are found suppressed for weeks. Cryotherapy induces effects both locally and at the level of the spinal cord via neurological and vascular mechanisms. Topical cold treatment decreases the temperature of the skin and underlying tissues to a depth of 2 to 4 cm, decreasing the activation threshold of tissue nociceptors and the conduction velocity of pain nerve signals this results in a local anaesthetic effect called cold-induced neuropraxia.

Rheumatoid arthritis (RA) as a chronic autoimmune disorder that primarily affects the joints, causing pain, swelling, stiffness, and potential deformities over time. It occurs when the body's immune system mistakenly attacks its own tissues, leading to inflammation in the joints and other organs. Treatment for rheumatoid arthritis often involves a combination of medication, physical therapy, lifestyle changes, and in some cases, surgery. Cryotherapy, which involves the application of cold temperatures to the body, has been explored as a complementary therapy for managing the symptoms of RA.

Rheumatoid arthritis affects an estimated 10 million Indian, three fourth of them women. It can strike at any age but usually appears between ages 20-50. The disease can severely deform joints. Some people become bedridden. Pain in Rheumatoid arthritis patients will cause immobility, swelling and stiffness. Pain is often managed with the help of various modalities include pharmacological and non-pharmacological approaches Currently there is no curative therapy for Rheumatoid arthritis therefore more patients are subjected to various lifelong adjustments & treatment modalities, so researcher found interest to do the study on pain relief through Cryotherapy among patients with Rheumatoid arthritis.

## **MATERIALS & METHODS**

This study had done using a quantitative approach with a quasi experimental design to evaluate the effectiveness of cryotherapy among Rheumatoid arthritis patients. Data was collected from patients with Rheumatoid arthritis between the age group of 30 to 65 yrs. At an orthopaedic centre in Western Maharashtra. Data was collected by random sampling technique. 30 samples were taken for the study from an Orthopaedic centre, which is a 150 bedded hospital and round 100 to 150 Orthopaedic cases attended in Orthopaedic OPD every day . Around 10 to 12 surgeries carried out in alternative days.

Inclusion Criteria consisted of Patients with Rheumatoid arthritis, between the age group of 30 to 65yrs who are willing to participate in the study. Sample. Patients those who had surgery and those had previous exposures with Cryotherapy were excluded from study.

The questionnaire contained two sections (a) Demographic data which included items for obtaining information regarding age, sex, duration of illness & duration of treatment.

(b) Mc Caffery numerical rating scale to assess the levels of pain among patients with Rheumatoid arthritis patients Pre-test & post-test. Effectiveness of Cryotherapy was interpreted as per the difference in the score of pre-test & post-test. The scoring was as follows.

≥5 Effective

3 – 4 Moderately Effective

0 – 2 Ineffective

Pilot study was conducted among seven patients in OPD purpose of study, After pilot study and analysis of tool, modification was done in methodology to make it more relevant and understandable to the participants.

Data was collected for a period of three months. The investigator visited the OPD and identified the patients with Rheumatoid arthritis and established good rapport with the patients. After explaining the purpose of the study Pre-test of level of pain assessed with MC Caffery numerical rating scale of pain assessment. This test was done for 20 minutes. Every day an average of 2 to 3 patients were assessed. Pre-test of assessment of pain using pain scale. Consecutive 5 days of Cryotherapy was administered, and Post-test was done on the 6<sup>th</sup> day of Pre-test.

The study was conducted only after obtaining approval from the research committee. The purpose of the study and the voluntary nature of participation were explained to the subjects before data collection and verbal consent was obtained. The investigator conducted the study based on ethical considerations.

## RESULTS

### Demographic Data

It includes items for obtaining information regarding age, sex, duration of illness & duration of treatment.

Demographic Variables		Frequency	%
Age	<45	03	10.0%
	46-50	09	30.0%
	51-55	05	16.7%
	56-60	08	26.6%
	>60	05	16.7%
Sex	Male	09	30.0%
	Female	21	70.0%
Duration of illness	>5yrs	04	13.4%
	3-4yrs	24	80%
	1-2yrs	02	6.6%
	<1yr	0	0%
Duration of Treatment	> 5yrs	05	16.7%
	3-4 yrs	22	73.3 %
	1-2 yrs	03	10 %
	< 1yr	0	0 %
Total		100	100%

**Table1;** Distribution of the patients according to their age, sex, duration of illness & duration of treatment.

Out of all, 10.0% of samples were in the age group of < 45 years, 30.0% are in the age group of 46-50 years, 16.70% are in the age group of 51-55 years and 26.60% are in the age group of 56-60. It clearly states that highest percentage was in the age group of 46-50 years. 30 % of samples are male and 70.0% are female. Duration of illness in majority (80%) of sample was between 3-4 years and duration of treatment in majority (73.3%) was between 2-3 years.

Assessment of pain using Mc Caffery numerical rating scale

Pain Scale Score	Pre-Test		Post -Test	
	No	%	No	%
>8	23	76.7%	0	0 %
6-7	07	23.3%	0	0 %
4-5	0	0 %	04	13.3 %
<3	0	0 %	26	86.7 %
Total	30	100 %	30	100 %

**Table 2:** Levels of pain among patients with Rheumatoid Arthritis.

The results clearly states that majority (73%) of sample had felt cryotherapy effective whereas 27% described it as moderately effective.

## Discussion

Pain is a multidimensional phenomenon with far-reaching consequences on human life. Understanding pain at fundamental level is crucial for developing effective strategies for pain management and improving overall quality of life. Embracing cryotherapy as part of a comprehensive approach to OA management holds great potential in enhancing the well-being and comfort of those affected by this common joint disorder.

Present study aimed to assess the pain level of the patients with Rheumatoid Arthritis pre and post cryotherapy. The results revealed that 73% of sample reported that cryotherapy was effective in reducing their pain. 23% felt partial effectiveness. It clearly emphasizes the efficacy and importance of cryotherapy. Cryotherapy is a feasible, non-expensive and harmless therapy which can be practiced for patients of all ages after consulting the therapist. The patients need to be cautioned regarding reporting in case of any discomfort.

This study explains the importance of cryotherapy in pain management of Rheumatoid arthritis patient which is congruent with a study conducted by Hirvonen (2013) on pain management with different cryotherapy on 60 patients who were active zero positive rheumatoid arthritis, this also revealed the effectiveness of cryo therapy with cold packs for the pain management of Rheumatoid arthritis.

The findings of the study strongly concluded stating effectiveness of cryotherapy. Vitull.v Babolic (2013) revealed from his study among 30 patients pain threshold measured before and after warm bath & ice massage for 30 min. he stated that cryotherapy for 30 min were more effective than warm bath, The same was stated & analysed by our study with 86.7% of effectiveness with cryotherapy in pain management of Rheumatoid arthritis.

## Conclusion

Pain is a multidimensional phenomenon with far-reaching consequences on human life. Understanding the intricate neurophysiological mechanisms and classifying pain types is essential for tailoring effective interventions and improving the overall well-being of individuals experiencing pain. The present study assessed effectiveness of cryotherapy in reducing pain among patients with Rheumatoid arthritis. The overall findings lead to the necessity to enhance education regarding the effective use of cryotherapy in pain management among patients with Rheumatoid arthritis. Potential risk in cryotherapy is very minimal as well as it is inexpensive and feasible method. Hence it is considered to be the best technique in effective management of pain along with control of stress & anxiety level of patients. Adequate guidance & knowledge should be imparted to the patients. Possible intervention & scientific reasoning should be helpful in impacting the knowledge regarding the effective use of cryotherapy in pain management.

## Competing interests

The authors declare that they have no competing interests.

## Contribution of Authors

All three authors significantly contributed to the design and analysis of the manuscript. JT conceptualized the project, JT and SR had conducted the study, contributed in data coding and analysis, JG designed and prepared the final draft of the article.

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