Assess the Efficacy of Hot Water Application With EPSOM Salt in Reducing Joint Pain among Geriatric with Arthritis

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ABSTRACT

Arthritis affects 15% of people i.e. over 180 million people in India. Application of the heat generally or locally producing the body physiological change, such as vasodilatation and muscle relaxation that produces beneficial effect therapeutic effect to pain relief Aims and To evaluate the effectiveness of hot water compress with Epsom salt in reducing joint pain among old patients with arthritis in experimental and control group. Quasi-experimental study research design was used to conduct this study, simple random sampling used to collect data. The subject consisted of 60 geriatric patients who having joint pain, in the selected community of Wardha a Epsom salt hot water application Epsom salt compress was prepared by adding 30 grams of Epsom salts to one liter of boiling water (The temperature of the boiling water was as tolerated by the client) creating a hot compress by dipping a clean washcloth in the boiling water, wringing it out, Applying for 20 minutes over the joint in which pain was present, twice a day. The result revealed that out of 30 experimental samples, pretest mean score level of pain was 3.10 with the standard deviation of 0.60 whereas after implementation of Epsom salt with hot water application, the posttest mean pain score was 0.70 with the standard deviation of 0.79 The effectiveness was statistically tested by paired t test which was found to be highly statistically significant at p less than 0.001. The findings of the study regarding effectiveness of warm Epsom salt application to the knee joint pain can make the health care workers, specially nurses and doctors aware of it and implement this method as a protocol and should be used by all for the benefit of socio economical class people as it is cost effective but gives good results in reducing knee joint pain in arthritis patient. Warm Epsom salt application is highly effective in reduction knee joint pain in arthritis patient.

KEY WORDS: EFFICACY, HOT WATER APPLICATION, EPSOM SALT, ARTHRITIS, JOINT PAIN

INTRODUCTION

Rheumatoid arthritis is a chronic, inflammatory disorder which affects many parts like joints of hands and feet, many tissues of the body, organs. In this disorder the immune system of the body attacks its own tissue which includes joints. it can attack internal organs also in severe cases. The onset of the rheumatoid arthritis is more frequent which is between the ages of 40 and 50. If the inflammation associated with the rheumatoid arthritis is

for longer period then it can cause joint deformity and bone erosion.

The primary type of OA is most commonly caused by aging process. the second most common rheumatologic problem is OA and also most frequent joint disease with the prevalence rate of 22–39% in India. The prevalence rate increases with aging process. Nearly 45 and 70% of the women have the symptoms and radiological evidences of pathology. It is one of the major causes of mobility impairment among females. Applying general or local heat that causes physiological changes in the body such as vasodilatation and muscle relaxation that causes the beneficial therapeutic effect of pain relief, moist heat application is a non-pharmacological, inexpensive and easiest solution that has a beneficial effect on pain in the knee joint. It causes vasodilatation and penetrates deeper into the muscle, thereby minimizing muscle spasm and discomfort.

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This was also supported by a study was conducted by Amudha, G This study focuses on the effectiveness of hot water compress with Epsom salt in relieving knee joint pain among elderly women in urban areas, Chennai. The clients in the experimental group 58% of reduction in pain levels as compared to the clients in the control group who had 3% of pain reduction. People today rely on pharmacological intervention to relieve pain, it has side effects. If we use hot water compress with Epsom salt to relieve muscle pain which has been proved in this study, it will be economical, culturally accepted, it can be practiced safely at home and it has less side effect as compared to pharmacological intervention.

This research will examine the effectiveness of hot water application with Epsom salt in reducing joint pain among geriatric with arthritis. To evaluate the effectiveness of hot water compress with Epsom salt in reducing joint pain among old patients with arthritis in experimental and control group. An experimental research approach and Randomized controlled Trial Research Design was used in the study. The study was conducted in rural and urban area of community Wardha district. The population

of the study was geriatric who were having arthritis joint pain and who were fulfilling the inclusion criteria.

MATERIAL AND METHODS

The sampling technique used was purposive sampling technique. The sample was consisting a total number of 60 subjects 30 experimental group and 30 control group. The study was approved by the institutional ethical committee and the study was conducted in accordance with the ethical guidelines. Duration of the study as per the guidelines, the total duration of study will be 10 months after approval of synopsis from ethical committee. The questionnaire to assess the effectiveness of hot water application with Epsom salt to reducing joint pain among geriatric with arthritis. An experimental research approach and randomized controlled trial research design was used in the study. The study was conducted during December 2019 to February 2020 and the setting was selected in rural and urban area of community Wardha district. The population of the study was geriatric who were having arthritis joint pain and who were fulfilling the inclusion criteria.

Severity	Pain score	Severity	Description of experience
No pain	0	No pain	I have no pain
Medium pain	1 2	Minimal Mild	My pain is hardly noticeable I have low level of pain .i am aware of my pain only when I pay attention to it
	3	Uncomfortable	My pain bothers me but I can ignore it most of the time
Moderate pain	4 5 6	Moderate Distracting Distressing	I am constantly aware of my pain but I can continue most activities I think about my pain most of the time .I can't do some of the activities I think about my pain all of the time. I give up many activities because of my pain
Severe pain	7 8 9 10	Unmanageable Intense Severe Unable to move	I am in pain all the time. It keep me from doing most activities. My pain is so severe that it is hard to think of any think else. Talking and listening are difficult. My pain is all that I can think about ,I can barely talk or move because of the pain I am in bed and can't move due to my pain I need someone to take me to the emergency room to get help for me pain

The sampling technique used was simple random sampling technique. Sample size calculation $N = \frac{x^2 \cdot N \cdot P(1-P)}{c^2(N-1) + x^2 \cdot P(1-P)}$ $X^2 =$ Chi-square value for 1 degree of freedom at some desired probability level. This is at 3.84 at 5% level of significance= 50% proportion =0.50C= Confidence interval of the one choice (95% CI) =0.05 =1.96*1.96*0.028* (1-0.028)/ (0.05*0.05) =41.82119the sample was consisting a total number of 60 subjects. The study was approved by the institutional ethical committee and the study was conducted in accordance with the ethical guidelines. (Ref.No.DMIMS (DU)/ IEC/2019/7923).

Modified Numeric Pain Rating Scale It is 11 point numerical rating scale (0-10 scale of pain severity) to assess the severity of among geriatric suffering from arthritis. It includes 11 statements containing description of pain experiences indicating severity of pain in the form of number. The scale of pain is divided as none (0), mild (1-3), moderate (4-6) and severe (7-10) .For the purpose of statistical analysis of pain in divided as scoring of numerical pain rating scale.

Inclusion criteria: The study participants those who were able to understand Marathi and Hindi, who were willing to give consent, who were available at the time of data collection, which have arthritis are under 65 years old in rural and urban community area. Geriatric chief complaint the area around the joint is swollen, red, tender, or warm to the touch, pain in joint, the pain persists for three days or more. Numeric rating scales (NRS) use for assessment of pain.

Exclusion criteria: We excluded geriatrics clients with severe neuropathies, burns, skin lesion on the joints, geriatric clients with complicated like facilities, vascular compromise, and systemic lupus erythematosus, and the geriatric clients with fracture, blood disorders, mentally not fit. This diseases rule out from history collection physical assessment and laboratory report.

RESULTS

Section A: Distribution of geriatric with regards to demographic variables.

Table 1 shows experimental group 26.7% of the geriatric were in the age group of 60-65 years, 50% in control group and 36.70% in experimental group were in the age group of 66-70 years, 23.3% in control group and 16.7% in experimental group were in the age group of 71-75 years and 26.7% in control group and 20% in experimental group were in the age group of 76-80 years.

Table 1. Percentage wise distribution of geriatric according to their demographic characteristics.

Demographic Variables	Control Group n=30	Experimental Group n=30
Age(yrs)		
60-65 yrs	0(0%)	8(26.7%)
66-70 yrs	15(50%)	11(36.7%)
71-75 yrs	7(23.3%)	5(16.7%)
76-80 yrs	8(26.7%)	6(20%)
Gender		
Male	13(43.3%)	16(53.3%)
Female	17(56.7%)	14(46.7%)
Education		
Uneducated	13(43.3%)	6(20%)
Primary	10(33.3%)	16(53.3%)
Secondary	7(23.3%)	8(26.7%)
Occupation		
Housewife	28(93.3%)	21(70%)
Self-Employed	2(6.7%)	9(30%)
Monthly family income(Rs)		
<Rs 10000	14(46.7%)	20(66.7%)
Rs. 10001-15000	9(30%)	7(23.3%)
Rs. 15001-20000	7(23.3%)	3(10%)
>Rs 20000	0(0%)	0(0%)
Do you perform any exercise?		
Yes	17(56.7%)	19(63.3%)
No	13(43.3%)	11(36.7%)
If yes, what type of exercise?		
Yoga	9(52.9%)	10(52.6%)
Walking	8(47.1%)	9(47.4%)

Section B-assessment of level of joint pain among geriatric with rheumatoid arthritis in experimental and control group

Table 2 shows that 6.67% of the geriatric at post test had no pain, each 66.67% of the geriatric at pre and post test had mild pain and 33.33% at pre test and 26.67% at post test had moderate pain. Minimum joint pain score in pretest was 1 and at post test it was 0 and maximum joint pain score at pre and post test was 4. Mean joint pain score at pretest was 3.03 ± 0.92 and at post test it was 2.66 ± 1.21 .

Table 2. Assessment with level of joint pain in control group

Level of joint pain score	Score Range	Level of joint pain score	
		Pre Test n=30	Post Test n=30
No pain	0	0(0%)	2(6.67%)
Mild Pain	1-3	20(66.67%)	20(66.67%)
Moderate Pain	4-6	10(33.33%)	8(26.67%)
Severe Pain	7-9	0(0%)	0(0%)
Worst Pain	10	0(0%)	0(0%)
Minimum score		1	0
Maximum score		4	4
Mean pain score		3.03 ± 0.92	2.66 ± 1.21

Table 3. Assessment with level of joint pain in experimental group

Level of joint pain score	Score Range	Level of joint pain score	
		Pre Test (n=30)	Post Test (n=30)
No pain	0	0(0%)	15(50%)
Mild Pain	1-3	23(76.67%)	15(50%)
Moderate Pain	4-6	7(23.33%)	0(0%)
Severe Pain	7-9	0(0%)	0(0%)
Worst Pain	10	0(0%)	0(0%)
Minimum score		2	0
Maximum score		4	2
Mean pain score		3.10 ± 0.60	0.70 ± 0.79

Table 3 shows that 50% of the geriatric at post test had no pain, 76.67% of the geriatric at pre and 50% at post test had mild pain and 23.33% at pre test had moderate pain. Minimum joint pain score in pretest was 2 and at post test it was 0 and maximum joint pain score at pre test was 4 and at post test was 2. Mean joint pain score at pretest was 3.10 ± 0.60 and at post test it was 0.70 ± 0.79 .

Section C: Evaluation of effectiveness of hot water compress with Epsom salt in reducing joint pain among geriatric with rheumatoid arthritis in experimental and control group

Table 4 shows the comparison of pretest and post test joint pain scores of geriatric in control group. Mean, standard deviation and mean difference values are compared and student's paired 't' test is applied at 5% level of significance. The tabulated value for $n=30-1$ i.e. 29 degrees of freedom was 2.05. The calculated 't' value i.e. 2.25 are much higher than the tabulated value at 5% level of significance for overall joint pain score of geriatric which is statistically acceptable level of significance. Hence it is statistically interpreted that the hot water compress with Epsom salt in reducing joint pain among geriatric was effective.

Table 4. Significance of difference between joint pain score in pre and post test of geriatric in control group

Overall	Mean	SD	Mean Difference	t-value	p-value
Pre Test(n=30)	3.03	0.92	0.36±0.88	2.25	0.032
Post Test(n=30)	2.66	1.21			S,p<0.05

Table 5. Significance of difference between joint pain score in pre and post test of geriatric in two groups

Overall	Mean	SD	Mean Difference	t-value	p-value
Control(n=30)	0.36	0.88	2.03±0.25	7.86	0.0001
Experimental(n=30)	2.40	1.10			S,p<0.05

Table 5 shows the comparison of difference between pretest and post test joint pain scores of geriatric in control and experimental group. Mean difference, standard deviation and mean difference values are compared and student's unpaired 't' test is applied at 5% level of significance. The tabulated value for $n_1+n_2-2=30+30-2$ i.e. 58 degrees of freedom was 2.00. The calculated 't' value i.e. 7.86 are much higher than the tabulated value at 5% level of significance for overall joint pain score of geriatric which is statistically acceptable level of significance. Hence it is statistically interpreted that the hot water compress with Epsom salt in reducing joint pain among geriatric was effective.

DISCUSSION

The effectiveness of Hot water application with Epsom salt among geriatric with arthritis in selected rural and urban area at Wardha district. The objective was to evaluate the effectiveness of hot water application with Epsom salt in reducing joint pain with arthritis among geriatric with arthritis. In the control group, 23(76.67%) of the geriatric are having mild pain, 7(23.33%) are having moderate pain. In another study According to Fioravanti A, Tenti S, Giannitti C, Fortunati NA, Galeazzi M. 2013 Jan 14. conducted a prospective randomized, single blind controlled trial to evaluate the effectiveness of Epsom salt compress in 60 outpatients with bilateral knee pain divided into two groups with experiment group (n = 30) treated with 12 daily generalized thermal baths with magnesium sulfate mineral water added to usual treatment and control group (n = 30) continued regular outpatient care routine (exercise, NSAIDs and/or analgesics) for a duration of three months the study results confirmed that Epsom salt compress had a beneficial effect in patients with knee OA. This study was completed on 200 by Oosterveld FG, & Rasker JJ. reviewed the scientific basis for the treatment of arthritis pain with locally applied heat. They reviewed the experimental studies in healthy subjects and in

patients. They found that the effect of heat on pain, stiffness of joints, grip strength and joint function in inflamed joints reported beneficial effects. They suggested that the heat can be applied for chronic inflammation.

The study finding was supported by the study conducted by Satralkar SP and Dhudum B 2016 [1] to assess the effectiveness of application of warm compress with Epsom salt to reduce knee joint pain among women. The nonprobability purposive sampling technique was used, and 60 samples were selected, in which 30 samples were Epsom salt application group and 30 samples were control group. In the experimental group, hot water application with Epsom salt was done with 200 mg of Epsom salt mixed in hot water, and the painful joints were bathed with hot water for 20 minutes thrice a week. The result revealed that posttest level of pain in the control group was $p=8.1$ and in the experimental group $p=1.03$, which indicates warm Epsom salt application was highly effective in reduction of knee joint pain in arthritis patient.

Limitation: The study was limited to duration would give more relevant results with variations of any research, but the investigator planned to complete the research work within two months to get more feasibility of getting sample. The study was done only on women because females have more joint pain than males.

CONCLUSION

Justification for undertaking this study was to relieve the clients from rheumatoid arthritis joint pain by hot water compress with Epsom salt and to determine its effectiveness, so that hot water compress with Epsom salt can be used in the future for all rheumatoid arthritis joint pain patients for health promotion. From this study it is statistically interpreted

that hot water compress with Epsom salt in reducing joint pain among geriatrics was effective.

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