TO COMPARE THE EFFICACY AND SAFETY OF THIOCOLCHICOSIDE AND CHLORZOXAZONE IN MUSCLE SPASM ASSOCIATED WITH LOW BACK PAIN

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ABSTRACT

BACKGROUND

Higher incidence of LBP is reported in Indian population in younger patients due to occupational exposure and lack of exercise. In general, LBP is managed with the short-term use of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) and centrally acting skeletal muscle relaxants.

Aim- To compare the safety and efficacy of Thiocolchicoside and Chlorzoxazone in the treatment of low back pain associated with muscle spasm.

MATERIALS AND METHODS

This non-randomised controlled trial was conducted with 60 outpatients suffering from LBP who met inclusion and exclusion criteria. Finger-to-floor distance, Straight leg raising test, Pain assessment scale and Safety measures were used to measure the pain score on 1st and 7th day during treatment. The sample size estimation was also done at conveniences.

RESULTS

The baseline mean age for Group A and Group B was 48.9 ± 8.52 and 51.17 ± 8.15 respectively. On 1st day, the mean pain score of Group A and Group B was 6.37 ± 1.63 and 6.43 ± 1.79 and on 7th day the mean pain score was reduced to 2.17 ± 1.31 and 1.33 ± 1.63 respectively. There was statistically significant reduction in mean pain score in Group B compared to Group A at the end of the treatment.

CONCLUSION

Both the drug regimens were found to be effective, while Chlorzoxazone had higher efficacy compared to Thiocolchicoside at the end of treatment, but it was not statistically significant.

KEY WORDS

Low Back Pain, Thiocolchicoside, Chlorzoxazone, Muscle Spasm.

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BACKGROUND

Low Back Pain (LBP), a very common complaint among middle-aged population affecting 90% of all adults at least once in a lifetime and is usually associated with "muscle spasm" that is responsible for persistence pain.[1] Higher incidence of LBP is reported in Indian population in younger patients due to occupational exposure and lack of exercise.

It is a major health and socio-economic problem[2] and is associated with high costs of health care, work absenteeism and disablement.[3] In general, LBP is managed with the short-term use of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) and centrally acting skeletal muscle relaxants.[4] Unfortunately, NSAIDs have gastric intolerance, whereas most of the centrally acting muscle relaxants have central nervous system depressant side-effects such as sedation, dizziness, impairment of coordination, mental confusion, weakness etc.[5] Chlorzoxazone, a centrally acting muscle relaxant act primarily at the level of the spinal cord and subcortical areas of the brain, where it inhibits multisynaptic reflex arcs involved in producing and maintaining skeletal muscle spasm. The exact mode of action is not clear, may be related to the sedative properties of the drug. The side effect profile is similar to that of most of other muscle relaxants, except for a limited number of reported cases of significant hepatotoxicity, particularly by chlorzoxazone.[6]

Thiocolchicoside is a semi-synthetic derivative of colchicine, a natural glycoside originated from flower seeds of superb gloriosa.[7] It has an affinity for the inhibitory glycine and gamma-aminobutyric acid (GABA)-A receptors i.e. have glycomimetic and GABA-mimetic activity, therefore shows muscle relaxant action. As it has GABA-mediated action, so it shows both myorelaxant as well as analgesic activity. It has demonstrated its clinical efficacy and safety in many clinical trials.[8,9,10,11,12] It has also been reported that thiocolchicoside produces muscle relaxation without any subjective or objective sedative side-effects.[8]

Hence, the present study was undertaken to compare the efficacy and safety of thiocolchicoside and chlorzoxazone along with NSAIDS in patients with muscle spasm associated with acute lower back pain.

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MATERIALS AND METHODS

Study Design

This non-randomised controlled trial was undertaken in the outpatient department of orthopaedics in DBR and SK Super Speciality Hospital, Tirupati. Patients attending the outpatient department were screened and assessed according to the specified inclusion and exclusion criteria. A total of 60 eligible patients were taken for the study. Study by convenient allocation technique since the duration of the study was few months. The patients were selected by convenience allocation technique. The sample size estimation was also done at conveniences.

Inclusion Criteria

Patients of either sex in the age range of 18 - 55 years with a history of LBP and muscle spasm were included in the study.

Exclusion Criteria

Patients having low back pain with muscle spasm due to malignancy, infection, osteoarthritis and associated with other chronic diseases were excluded. Patients having active peptic ulcer disease, patients allergic to NSAIDs and patients who were on NSAIDs and muscle relaxants within 7 days were excluded from the study.

Criteria for Evaluation/ Finger-to-Floor Distance

It was measured by flexion at the hip joint in a standing position. The patients were told to bend down as far as possible without bending the knees and try to touch the floor with their fingers. The remaining distance between the floor and fingertips was measured by the ruler in centimetres.[13]

Straight Leg Raising Test

In this test articular excursion of the hip in degrees on performing Lasegue's manoeuvre before inducing pain in the supine position, which involved gradually raising of lower extremity by flexing the hip with the knee in extension passively. The angle between the raised limb and table-top was measured.[13]

Pain Assessment Scale

Assessment of intensity of pain at rest and pain on movement was carried out on day 1 (Visit 1) and days 7 (Visit 2) by means of a 10 cm Visual Analogue Scale (VAS)[26] as reported by a patient between 0 (No pain) and 10 (Unbearable pain). The patients were asked to score by ticking off the scale between 0 (No pain) and 10 (Unbearable pain).

Safety Measures

Side-effects such as tiredness, drowsiness, dizziness and alertness were noted based on history and observations of adverse reactions. Furthermore, global assessment of tolerability to therapy was assessed on a four-point scale of excellent/ good/ average/ poor.

Statistical Analysis

At the end of the study, the collected data was compiled and analysed using SPSS version 25.0.

The difference between the thiocolchicoside and chlorzoxazone group before and after administration of the respective drugs were compared using unpaired t-test. Demographic data and percentage was calculated using chi-square test. P value of 0.001 was considered significant.

RESULTS

	Group A	Group B
Age (Mean ± SD)	48.9 ± 8.52	51.17 ± 8.15
Males, n (%)	18 (60.0)	16 (53.3)
Females, n (%)	12 (40.0)	14 (46.7)

Table 1. Socio-Demographic Variables

	Group A	Group B	P value
Day 1	24.3 ± 11.41	16.6 ± 13.454	< 0.001
Day 7	6.83 ± 3.63	2.67 ± 2.155	< 0.001

Table 2. Finger-to-Floor Distance

The mean finger-to-floor distance of Group A patients on day 1 was 24.3 (± 11.41) cm and on day 7 was 6.83 (± 3.63) cm. This difference was statistically significant between day 1 and day 7. The mean finger-to-floor distance of Group B patients on day 1 was 16.6 (± 3.454) cm and day 7 was 2.67 (± 2.155) cm. This difference was also statistically significant between the day 1 and day 7. Though the statistical data was significant improvement in the same group from day 1 - 7, the comparison of betterment group was not significant (P value < 0.136).

Lasegue's Sign	Day 1		Day 7	
	Group A	Group B	Group A	Group B
Normal	23 (76.7%)	22 (60%)	27 (90%)	27 (90%)
Sedation	2 (6.7%)	1 (3.3%)	0	0
Drowsiness	0	0	0	0
GI disturbance	5 (16.7%)	7 (23.3%)	3 (10%)	3 (10%)
Total	**30 (100%)**	**30 (100%)**	**30 (100%)**	**30 (100%)**

Table 3. Lasegue's Sign of the Study Group at Day 1 and 7

On day 1, about 6.7% and 3.3% of the patients of Group A and Group B patients had sedation. 10% of Group A and Group B patient had GI disturbance. There was a statistically significant difference between the Lasegue's sign of the Group A and Group B on day 1. At the end of day 7, about 90% of the Group A and Group B patients were normal by Lasegue's sign. This difference in Lasegue's sign was not statistically significant between the two groups (P value < 0.012).

	Group A	Group B
Day 1	6.37 ± 1.63	6.43 ± 1.79
Day 7	2.17 ± 1.31	1.33 ± 1.63

Table 4. Visual Analogue Score

The mean VAS scores of Group A patients was 6.37 (± 1.63), which was reduced to 2.17 (± 1.31), which was statistically significant between day 1 to day 7. The mean VAS score of Group B patients on day 1 was 6.43 (± 1.79), which was reduced to 1.33 (± 1.63) on day 7. This difference was statistically significant. The VAS scores were statistically significant between the two groups on day 7. On comparing the groups, there was not significant difference (P value-0.010).

Lasegue's Sign – Day 7	Group A	Group B
Poor	1 (3.3%)	2 (6.6%)
Average	1 (3.3%)	1 (3.3%)
Good	18 (60%)	13 (43.3%)
Excellent	10 (33.3%)	14 (46.7%)
Total	30	30

Table 5. Distribution of the Study Group according to Global Scale

The global assessment scale has indicated that about 33.3% of the patients in Group A had the good grade 60% and 33.3% excellent grade among Group A patients. Among the Group B patients, 43.3% of the patients were graded as good and 46.7% were graded as excellent. This difference in grading of Global scale was statistically significant between Group A and Group B.

DISCUSSION

This study was conducted to compare the efficacy of Thiocolchicoside and chlorzoxazone. The main goal of the pharmacological intervention in low back pain is not only relief from the pain, but also to reduction of the muscle spasm and inflammation. Chlorzoxazone is a muscle relaxant which in addition to inhibition of mono- and multi-synaptic reflexes also regulates the blood supply to the skeletal muscles.[14] Thiocolchicoside being a spinal GABA agonist compound has been reported to exert inhibitory effect and result in muscle relaxation.[15] Unlike other muscle relaxants, both of these drugs have been reported to have less gastrointestinal side effects and sedative effects.[16]

Present study confirms the efficacy of both FDCs in the treatment of painful muscle spasm. The study reported a statistically significant improvement in the finger-to-floor distance on the 1st ($P < 0.001$) and 7th day ($P < 0.001$) as compared to baseline on both the groups. However, the decrease in hand-to-floor distance was more pronounced within Group A as compared to Group B, though the difference between the two groups was not found to be statistically significant. A study by Cabitza et al had shown to improve the FFD more in Eperisone group similar to the results of this study after 7 days of treatment.[13] Maaz et al[17] have also supported the results of Cabitza et al. In contrary to these results, Rao et al[18] and Soonawala et al reported Thiocolchicoside is a better drug of choice in comparison with Eperisone.[12]

The mean VAS scores of Group A patients was 6.37 (± 1.63), which was reduced to 2.17 (± 1.31) which was statistically significant between day 1 and day 7. The mean VAS score of Group B patients on day 1 was 6.43 (± 1.79), which was reduced to 1.33 (± 1.63) on day 7. There was a statistically significant difference between the two groups. Maaz et al[17] have also reported that the VAS score of pain decreased significantly in patients receiving Thiocolchicoside and Chlorzoxazone. Study by Soonawala et al[12] has also reported that both Eperisone and Thiocolchicoside decrease the muscle spasm.

The global assessment scale has indicated that about 33.3% of the patients in Group A had the good grade 60% and 33.3% excellent grade among Group A patients. Among the Group B patients, 43.3% of the patients were graded as good and 46.7% were graded as excellent. This difference in grading of Global scale was statistically significant between the two groups. No studies have reported the findings of Global assessment and hence these study results were not compared with other studies.

The usual gastrointestinal side effects due to Thiocolchicoside and Chlorzoxazone have been reported and treated appropriately by using proton pump inhibitors.

CONCLUSION

Thiocolchicoside and chlorzoxazone are found to be effective drugs in relieving the lower back pain associated with muscle spasm. Chlorzoxazone was found to be more effective in terms of finger-to-floor distance and improvement in Lasegue's sign when compared to thiocolchicoside, which was not statistically significant.

In conclusion, Thiocolchicoside and chlorzoxazone along with NSAIDS for 7 days in the treatment of LBP significantly reduces the intensity of pain and improves the mobility without causing side-effects.

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