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EFFICACY OF DICLOFENAC VERSUS COMBINATION OF IBUPROFEN AND PARACETAMOL, IN ACUTE LOW BACK PAIN WITH SCIATICA

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ABSTRACT

Sciatica is a leading cause of low back pain. It is very common in young population of rural India. Paracetamol, non-steroidal anti-inflammatory drugs and muscle relaxants are commonly prescribed alone or in combination for the treatment of back pain. Various clinical trials were and are being conducted for the preferred NSAIDs for its efficacy, safety and tolerability in treatment of acute low back pain due to disc prolapsed. We conducted a double bind randomized controlled trial to compare the efficacy of diclofenac Sodium versus Ibuprofen and Paracetamol combination in acute disc prolapsed with sciatica. Post medication mean pain score (VAS) was 3.4 ± 1.73 for Diclofenac Sodium where as it was 2.7±0.63 for Ibuprofen+ Paracetamol combination. Mean TOPAR 8 hrs and 24hrs was 17.3±3and 58.4 ±12.4 respectively for Diclofenac Sodium where as it was 24.5 ±3 and 72.7 ±8.54 for Ibuprofen + Paracetamol combination. Mean SPID at 8 hrs was 10.0±3.55 with Diclofenac Sodium and 15.1±4.18 with combination. Adverse events in terms of nausea, gastritis, epigastric pain, flatulence, indigestion, hypersensitivity reaction, dizziness and discontinuation due to adverse reaction occurred in 237 patients on combined drug therapy where the number was 688 patients for Diclofenac Sodium. So it was concluded that on final assessment 70.8% of Ibuprofen + Paracetamol group rated their tolerability as "VERY GOOD" as compared to 50.89% of those in Diclofenac Sodium group. Moreover, Ibuprofen + Paracetamol shows a trend towards superiority in its efficacy and tolerability compared to diclofenac sodium.

KEYWORDS: Diclofenac Sodium, Ibuprofen, Paracetamol, Sciatica, Summed pain intensity difference (SPID), Visual analogue scale (VAS), Total pain relief (TOPAR).

INTRODUCTION

Low back pain, like abdominal pain is a symptom, not diseases. It's a self-limiting condition which includes pain, muscle tension or stiffness. The pathologic basis for the pain may be something within the spine or a lesion outside the spine. The causes are many but may be broadly classified as spondylogenic or neurogenic and viscerogenic, vascular, or psychogenic.[1] Pain may be localized in the area between pelvic blades and the folds of the buttocks or may radiate to the legs. (Sciatica).[2]

In a national survey conducted by The Royal of Medicine Press Ltd found that in an adults, 40% were suffered from back pain which had lasted for more than one day and that sought medical advice.[2] In general, around 60-80% of the total world's population suffers low back pain at some point of their life.[3] Back pain is increasing day by day for seeking consultation.[4] In United States, the prevalence of back pain lasted for minimum of 1 month was 17.8%, whereas in developing countries, back pain was among the most commonly occurring symptoms.[5] Heavy manual work might be the reason behind this. Sciatica is a leading cause of back pain with radiculopathy. In the vast majority of cases, it is caused by a herniated or acute disc prolapsed. It occurs when one of the discs that sit between the vertebrae is damaged and slips out of its confined area pressing on the nerves. Less common causes include spinal narrowing of the nerve passages in the spine), a spinal injury or infection, or a growth within the spine (such as a tumors.[6]

Low back pain can be stated as acute when the duration of an episode, persist for less than 6 weeks; sub-acute

when persists between 6 and 12 weeks; chronic when persists for 12 weeks or more.[7] The management of sciatica depends on the cause of pain. Management can be medical therapy, non-surgical or surgical therapy.[8] Non-Surgical treatment includes counseling, rest, braces, spinal manipulation, exercise, stretching and proper lifting techniques, injection like transforaminal, interlaminar epidural and caudal steroid infiltrations, facetal block. Surgical treatment is given when non surgical treatment fails. This includes the conventional methods like posterior decompression in the form of wide laminectomy and discectomy, fenestration, spinal fusion. Modern techniques includes endoscopic discectomy and disc replacement.[9] Medications commonly used include NSAIDs and muscle relaxants.[10] For uncomplicated low back pain, the role of NSAIDs for short term relief of pain has already been established.[11] Various clinical trials were and are being conducted for the preferred NSAIDs for its efficacy, safety and tolerability in treatment in acute low back pain due to disc prolapsed**.** However, the rationale behind this study was to compare the efficacy of the two groups of medication that is diclofenac versus ibuprofen and paracetamol combination in terms of its analgesic effect, improvement in functional ability, prevention of recurrence and chronicity. Both groups were also compared for their safety and tolerability in the context of rural population of India. So, this study will serve as a reference for the treating physicians, for choosing the most suitable NSAIDs for such patients.

MATERIALS AND METHOD

This study was conducted in a single centre at Orthopedics Out Patients Department (OPD) at Acharya Vinobha Bhave Rural Hospital, Wardha, India. It was approved by the ethical committee of the hospital. Written consent forms were read and signed by all the participants before enrolling themselves in the study. This double blind randomized controlled trial was done between months of Sept 2015 to Jan 2016, for a period of 6 months. However, data collection was done for a period of 1 month for each patient.

1564 patients with age between 20-60 years with localized uncomplicated acute back pain with sciatica were enrolled in the study. Patients with other type of acute back pain like postural, muscular, degenerative, and vascular where excluded. All the patients were divided into 2 groups (Group I and II). Group 1 is administered medication A whereas group II administered medication B. Medication administered included oral diclofenac 50 mg per oral thrice daily for 7 days for one group and combination of oral Ibuprofen 400 mg plus paracetamol 500 mg per oral thrice daily for 7 days for another group. Both patient and administrator were unaware of the type of medication administered them. All the patients were evaluated for pain symptoms at 0 hrs,0.5 hrs,1 hrs,2 hrs,4 hrs and 8 hrs with help of pain intensity score from 1-5 and VAS score. Total pain relief over eight hours (TOPAR 8) was calculated by multiplying the pain relief score at each post dose time in 8 hrs. Pain Intensity Difference (PID) was calculated as baseline pain intensity score minus the pain intensity score at each post dose time point. Summed PID over 8 hours (SPID8) were calculated by multiplying the PID score at each post dose time point by the duration (Hours) and then summing these values (up to eight hours). Patients were also studied for their reason for discontinuation of medication in terms of pain relief and adverse effect such as nausea, vomiting, epigastric pain, fluctuance, indigestion, dizziness, hypersensitivity reaction and adverse reaction. Data analysis was done by using SPSS, version 15. Descriptive statistics was used to study the demographics.

OBSERVATION AND RESULT

In our study, amongst 1564 patients 735(47%) were females where as 827(53%) were males. Patients with age group 20-40 were 802 (51%) and 41-60 were 762(49%). 84% patients were involved in the heavy activities such as agriculture sector, industrial and transport work. 16% in the sedentary work like teaching, trading, household activities, government jobs, small business activities.

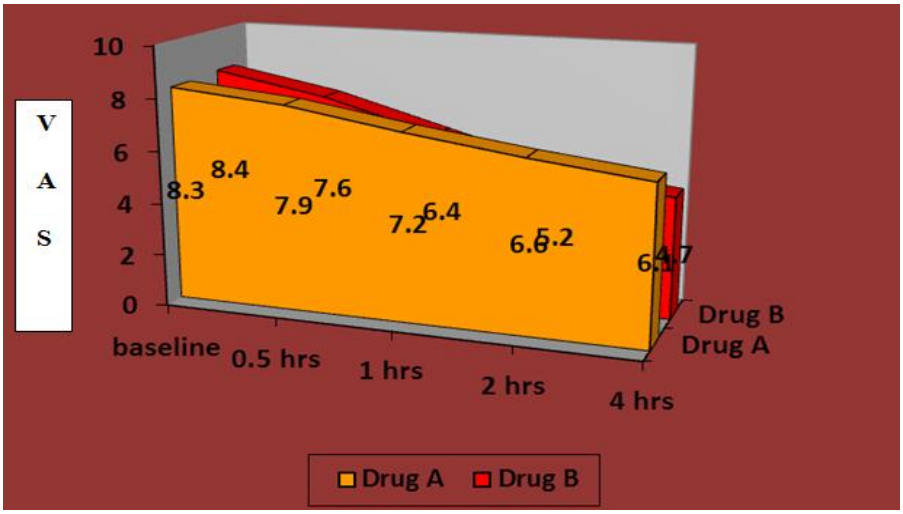

Figure 1: Mean total pain relief action

Table 1: Mean pain Scale- according to VAS

Drug	Mean pain scale (VAS)		p value
	Pre medication	Post medication after 7 days	
A	8.3	3.4±1.73	0.748(p>0.05)
B	8.4	2.7±0.63	0.367(p>0.05)

Table 2: Mean Summed pain relief scores (TOPAR 8) and mean summed pain Intensity difference (SPID)

Drug		Mean TOPAR 8(±SD)		Mean SPID(±SD)
	Baseline pain	8 hours	24 hours	8 hours
A	8.3	17.3(±3)	58.4(±12.4)	10.0(±3.55)
B	8.4	24.(±3)	72.7(±8.54)	15.1(±4.18)

Table 3: Adverse event profile of study drugs.

Adverse event	Drug A	Drug B
Nausea	89	54
Gastritis	103	26
Epigastric pain	87	28
fluctuance	94	61
Indigestion	182	21
Hypersensitivity reaction	18	4
Dizziness	8	nil
Discontinuation due to adverse reaction	107	43
Total	688	237

DISCUSSION

In our study acute sciatica showed equal distribution in all the age group and gender. while study done by Paul in 2008 concluded that the incidence of lower back pain increases with age.[12] Similar finding was seen in workers between age group of 45-64 years with prevalence being the same in both the sexes.[5] Back pain as the third most frequently reported symptom revealed in a national survey conducted in US among patients aged 75 years or older.[13] The reasons for this back pain may be lack of adequate physical activity, muscle weakness and some degenerative factors.[14] In the present study, the incidence of sciatica was similar in both genders. while study done in Taiwan by Manek showed more incidence of low back pain in females.[5] This contradicts our study because in our study we included patients of 20-60 years of age group, excluding the population of more than 60 years, which forms the bulk share of degenerative back pain population in the society. Back pain is also common in female after menopause i.e. after 55-60 years of age. Osteoporosis is the commonest cause of peri and post menopausal low back pain. In post menopausal period, there is decrease in bone density or a "thinning" of the bones of the lumbar spine (low back) due to drop in the level of estrogen.[15] More number of patients who complained of acute sciatica were involved in the heavy activities such as agriculture sector, industrial, and transport work in this study. Kar and Dhara found similar results in 2010. This may be because farmers or agricultural workers are involved in various farm activities like sowing, transplantation and harvesting and transport operations, that requires continuous and repetitive processes of bent posture for prolonged period, twisting of their waists. When such activities and stooping postures are sustained for long periods, they will definitely result in significantly higher proportions of disc disease.[16] Activities that require long periods of sitting, lifting heavy objects, bending or twisting, repetitive motions, or constant vibrations can be a predisposing factors for acute low back pain.[17] Though low back pain is also found among patients leading sedentary lifestyles, India being an agricultural country, sample included more number of patients come from agricultural background having acute back pain. The fact that those who lift more heavy weights are more likely to get acute low back pain, which was seen in this study, was similar to the findings of Manchikanti.[18] This study showed low back pain occurs in 15% to 64% after lifting heavy weights. This study also noticed some harmful activities like sudden lifting of objects by making unexpected maximum efforts, lateral bending and twisting. He also observed that people, who manually lift heavy weights, have eight times higher incidences of low back pain problems as compared to those involved in sedentary work. So, he concluded that heavy weight lifting, bending and twisting frequently at work can be risk factors for the development of low back pain with sciatica.[19]

Both the drug A(diclofenac 50 mg thrice daily) and drug B (Ibuprofen 400 mg plus paracetamol 500 mg thrice daily causes the significant pain relief at the 7th day during the total course of medication. The pain relief provided by the drug B was more superior to drug A. Mean total pain relief action when studied for the 1st 8 hrs after the administration of drug at baseline, 0.5hrs, 1 hrs, 2 hrs and 4hrs it was found that the drug B given more consistent pain relief as compare to drug B. Mean

Summed pain relief scores (TOPAR) at 8 hrs was 17.3± 3 for drug A and 24±3 for drug B. At 24 hrs it was 58.4±12.4 for drug A and 72.7±8.54 for drug B. Mean summed pain Intensity difference (SPID) at 8 hrs was 10.0 ±3.55 for drug A and 15.1±4.18 for drug B. this shows that the drug B has better and prolonged mechanism of action for pain relief. A double blind study conducted by Komali G, comparing the efficacy, safety and potency of Ibuprofen and Diclofenac sodium in acute pulpitis with moderate to severe pain. He found that Diclofenac Sodium is more potent compare to Ibuprofen.[20] In an another study by Derry CJ for assessing the efficacy and adverse effects of single dose oral ibuprofen plus paracetamol for acute postoperative pain, comparing other NSAIDS. He concluded that better pain relief was provided by combination of Ibuprofen plus paracetamol than either drug alone (at the same dose). The chance of additional dose for analgesia over about eight hours and an adverse event is negligible.[21] In the treatment of acute low back pain, Lahoti G evaluated efficacy and safety of fixed dose combination of aceclofenac, paracetamol, thiocolchicoside. His came to the conclusion that comination of aceclofenac, thiocolchicoside and paracetamol significantly reduced intensity of pain and improve the mobility of the patients.[22] In a comparative study by Perrot S on the efficacy and tolerability of Paracetamol/tramadol combination (325mg/37.5 mg) with tramadol (50 mg) alone (T) in patients with subacute low back pain. He found that the effective pain relief was provided by combination of Tramadol with paracetamol than tramadol alone for patients with subacute low back pain. However, the combination of paracetamol/tramadol resulted in 25% less tramadol than equianalgesic daily doses of Tramadol alone, considerably reduced the incidence of adverse effect and improved tolerability.[23] An another randomized open label comparative study by Nagendra S on efficacy of Aceclofenac and diclofenac sodium for relief of postoperative pain after third molar surgery, showed Aceclofenac as an effective and superior analgesic in the treatment of moderate to severe acute pain resulting from third molar surgery. Aceclofenac has rapid onset and longer duration of action compared to Diclofenac.[24] Furthermore, Aceclofenac showed tolerability profile superior to diclofenac. Large numbers of studies were done on the analgesic effects of non steroidal anti inflammatory drugs. They were either done on single NSAIDS or in combination. We found many research studies on diclofenac, ibuprofen and paracetamol alone or in combination for the treatment of post operative, post musculoskeletal injury pain. But none of the study was done to compare the efficacy and tolerability of diclofenac alone and ibuprofen paracetamol combination for acute sciatica. In our study the adverse events such as gastritis, epigastric pain, fluctuance, indigestion, hypersensitivity reaction, dizziness and adverse reaction occurred in 688 patients with drug A (Diclofenac 50 mg) and 237 patients with drug B(Ibuprofen and Paracetamol combination). Study done by F.A. Rossi contradicts our finding. In his double-blind comparison Between Diclofenac Sodium and Ibuprofen in Osteoarthritis. He concluded that diclofenac sodium presents a significant superiority over ibuprofen, with regard both to efficacy and tolerability. During treatment with diclofenac sodium no significant changes in laboratory data were seen thus confirming the tolerability of the drug.[25] In an another study by Komali G reported One patient in Diclofenac Sodium and two patients in Ibuprofen group with gastritis. Non of the patients in the drug groups reported with nausea, vomiting, diarrhea, dyspepsia, dizziness or urticaria. Though there were no adverse effects reported in the study group except for gastritis, a large sample size and long term studies are required to evaluate the adverse effects of these drugs.[20]

CONCLUSION

Overall both treatment groups showed pain reduction and improvement in spinal function. Ibuprofen + paracetamol group showed faster and worthwhile improvement in pain relief score which was significant. Progressive improvement in spinal mobility was seen in both groups, but was slightly higher in Ibuprofen + paracetamol Group. Ibuprofen + paracetamol group showed fewer adverse events causing it more tolerable as compared to diclofenac sodium. At final assessment 70.8% of Ibuprofen + paracetamol group rated their tolerability as "VERY GOOD" as compared to 50.89% of those in diclofenac sodium group. Moreover, Ibuprofen + Paracetamol shows a trend towards superiority in its efficacy and tolerability compared to diclofenac sodium.

CONFLICT OF INTEREST: None.

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