Comparative Study of Diclofenac Sodium and Flurbiprofen in Osteoarthritis

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Abstract

A comparative study was conducted to evaluate the therapeutic efficacy of diclofenac sodium and flurbiprofen both non-steroidal anti-inflammatory drugs (NSAIDS) in osteoarthritis. Forty patients of either sex between the ages of 3 5-60 years suffering from osteoarthritis of atleast one knee joint minimum of eight weeks duration were included in the study. Diclofenac sodium exhibited better results by improving the signs and symptoms of osteoarthritis in both high and low doses compared to flurbiprof en. The adverse effects observed were similar in both groups (JPMA 46:270, 1996).

Introduction

Osteoarthritis is an age related disease process which is prevalent throughout the world in all socio—economical groups. The historical prints indicate its presence even in the age of dinosaurs. Various datas are available showing different figures, but each data exhibits a higher incidence in females than males[1]. After the age of 35, 90% population suffers from some degree of OA (osteoarthritis) NSAIDS are the choice and mainstay for the symptomatic treatment of this life-long agony. In the past. more than a quarter century, starting from aspirin, analgesics ofdifferent groups have been produced but none is free of toxic effects, especially on gastro-intestinal tract (G.I.T.). 26000 hospitalizations and 2000 deaths occurred in USA in 1 993, due to G.l.T. complications of various NSAIDS used for osteoarthritis and rheumatoid arthritis[2]. Moreover, some are too toxic and can be used only for a couple of weeks and others are too costly and out of reach,

This presents a challenge for the clinician in selecting a most suitable NSAID. This study Was conducted to evaluate the merits of d iclofenac sod ium-mem her and flurbiprofen. Diclofenac sodium is the first of a series of phenylacetic acid derivatives and like other NSAIDS the mechanism of action is mainly by inhibiting the synthesis of prostaglandins at cyclooxygenase level. The drug is well absorbed by oral administration and peak plasma level reaches within 2 hours. Ninety-nine percent of drug is protein bound in plasma mainly with albumin.

Diclofenac sodium shows a tendency to accumulate in the synovial fluid which may account for its longer and better effects in articular conditions, It is eliminated in the metabo. lised form, about two-thirds through kidneys and one-third through bile. Approximately, 30% of the diclofenac patients show adverse effects mainly affecting gastrointestinal tract and liver. Flurbiprofen is a propionic acid derivative, chemicall)' described as 2 (2-fluro-4-biphenyl) propionic acid with a mode of action similar to other NSAIDS. Apart from its use in arthritis and other articular diseases, the drug is also available and approved as the only NSAID for topical opthalmic use. Orally the drug has a good tolerance, however, can induce gastrointestinal side effects or alter platelet functions.

Patients and Methods

Forty patients of either sex were selected randomly from the physiotherapy out-patients clinic of JPMC

(Jinnah Postgraduate Medical Centre, Karachi). The diagnosis was made clinically and confirmed radiologically and biochemically. The clinical parameters were: I. pain at rest, 2. pain on movement, 3. pain at pressure (tenderness), 4. walking time, 5. size of swelling, 6. limitation of movements. For recording of pain Goldie's 4 point score scale system was used[3]. Grading was done from 0 to Ill depending on the severity of the symptoms: Grade 0 = No pain= 0-0.9 on VAS, Grade I= Mild pain which can easily be tolerated by the patient= 1-2.9 on VAS, Grade II= Moderate pain=3-6.9 on VAS and Grade 111= Severe, unbearable pain= 7-10 on VAS. The recordings were then converted by VAS (Visual analogue scale) into numericals for statistical evaluation[4]. Walking time was recorded through a stop watch after asking the patient to walk a 40 feet distance in a straight direction on plain surface. The distance was reduced in severely ill patients and the time was then calculated accordingly. Swelling was recorded by a measuring tape encircling the most prominent portion ofthe joint and limitation of movements bygoniometer taking 0-140° as full range offlexion and extension Patients with known history of hypersensitivity to NSAIDS, suffering from any recent or concurrent major illness related to cardiovascular, renal, metabolic, haeniopoetic, hepatic or G.I.T. system were excluded. Lactating and pregnant ladies and those suffering from trauma or deformity of the vertebral column or lower limbs were also not included. All medications were stopped for 7 days the study.
The selected 40 patients (24 females and 16 males) were divided into 4 groups of 10 each, (6 females and 4 males) receiving diclolenac sodium or flurhiprofen in higher or smaller dose. The higher dose ofdiciofenac sodium was 75 mg h.i.d. (D1 group) and smaller dose 50 mg b.i.d. (D2 group) while the higher dose of flurbiprofen was 100 mg b.i.d. (Fl group) and smaller dose 50 mg b.i.d. (F2 group). Patients were asked to attend the OPD twice a week for follow up and recordings at 0 weeks and 6 weeks were made for the evaluation of results.

Results

Therapeutic efficacy of the two drugs (diciofenac sodium and flurbiprofen) in all groups by use of two doses of each for six weeks on the parameters of pain at rest, pain on movement and tenderness is shown in

Table I. Therapeutic efficacy in pain parameters after 6 weeks in all groups.

Group	Pain at rest		P Value	Pain on movement		P Value	Tenderness		P Value
	0 week	6 weeks		0 week	6 weeks		0 week	6 weeks	
D1 75 mg of diclofenace b.i.d	3.00 ±0.56	0.9 ±0.32	<0.05	4.10 ±0.37	2.50 ±0.37	<0.02	3.60 ±1.32	1.10 ±0.53	<0.05
D2 50 mg of diclofenac b.i.d	1.30 ±0.51	0.70 ±0.51	N.S	5.50 ±0.47	4.10 ±0.62	N.S.	2.90 ±0.91	2.20 ±0.69	N.S.
F1 Flurbiprofen 100mg b.i.d.	2.90 ±0.45	2.00 ±0.57	<0.05	4.90 ±0.28	3.70 ±0.57	<0.05	3.40 ±0.25	2.60 ±0.28	<0.05
F2 Flurbiprofen 50 mg b.i.d	1.80 ±0.20	2.70 ±0.50	N.S	3.80 ±0.46	3.50 ±0.56	N.S.	2.50 ±0.74	2.30 ±0.51	N.S.

N.S.= Non-significant. Values are expressed in mean±SE units.

Table I and their effects on swelling and limitation of movements in Table II.

Table II. Number of subjects showing swelling (S) and limitation of movements (L.M) in all groups and percentage of improvement.

		0 weeks	6 weeks	Percentage of improvement
D1 (Diclofenace 75 mg b..i.d.)	S	4	3	25.00
	L.M.	7	3	57.00
D2 (Diclofenac 50 mg b..i.d.)	S	0	0	0.00
	L.M.	1	1	0.00
F1 (Flurbiprofen 100 mg b.i.d.)	S	0	0	0.00
	L.M.	5	1	40.00
F2 (Flurbiprofen 50 mg b.i.d.)	S	0	0	0.00
	L.M.	2	2	8.00

S= Swelling, L.M= Limitation of movements.

The highest scores showing improvement of maximum number of parameters were seen in the patients included in group Dl (diclofenac 75 mg b.i.d.). However, this difference between group D1 and H (Flurbiprofen 100 mg b.i.d.) was not statistically significant, in parameters of pain at rest and tenderness. The D2 group (diclo'fenac 50 mg b.i.d.) also exhibited better hut statistically insignificant results as compared to group 1:2 (fiurbiprofen 50 mg b.i.d.). Adverse effects were severe epigastric pain in one patient from each D1 and Fl group who were dropped out. Three patients from D 1 and two from Fl groups complained of mild heartburn, dyspepsia and flatulence, but were able to continue the drugs alongwith antacids. None of the patients developed complaints indicating hepatic involvement.

Discussion

The higher dose of diclofenac (75 mg) showed better results in our study compared to the other groups on fiurbiprofen. This was also observed by Lister[5]. Results of our study group Fl (flurbiprofen 100 mg b.i.d.) match with those of 4 weeks study done by Misara[6]. Statistically significant improvement($P<0.05$) in pain at rest, pain on movement and tenderness was noted with same dose of flurbiprofen compared to placebo. F.)iclofenac in the smaller dose of 50 mg b.i.d. (100 mg daily) in group D2 did not produce significant improvement in the pain parameters. This is similar to the results of a study done on 52 patients which indicated little or no pain relief in 3 1 patients receiving diclofenac sodium in a similar dose (100 mg OD)compared to 21 patients receiving placebo[7]. Flurbiprofen in 50 mg h.i.d. (F2) was found even less effective than 50 mg of diclofenac sodium (D2) for the relief of pain. Majority of the patients of this group were shifted to. the higher dose group.

Diclofènac sodium in 75 b.i.d. was found to be effective for improving the signs and symptoms of osteoarthritis. However, it is recom mended that hepatic enzymes should he monitored because ofthe possibility of rise in SCPT in 1 5% cases receiving this drug[8]. Flurbiprofen in 100 mg b.i.d. doses is also effective in improving the signs and clolenac in 75 mg h.i.d. doses. Flurbiprofen in 50 mg hid. doses is almost ineffective to ameliorate pain in osteoarthritis.

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