T. A. I. Bouchier-Hayes

SULINDAC VERSUS IBUPROFEN IN SPRAINS AND STRAINS

Lt. Col. T. BOUCHIER HAYES, FRCP, DRCOG, RAMC*

Capt. A. FYVIE, MB, BS, RAMC*, P. G. JANKE, MRCP†

M. J. VANDENBURG, BSc, MRCP† and W. J. C. CURRIE, MD, MIBiol.†

**Royal Military Academy Hospital, Sandhurst*

*†Clinical Research Department, Merck Sharp & Dohme Limited, Hertford Road
Hoddesdon, Herts.*

SUMMARY

In a double-blind parallel group randomised study 191 patients with acute sprains and strains of ankle, hip, shoulder or knees were treated with either 400 mg sulindac or 1200 mg ibuprofen per day for 4 days; of these, 176 completed the trial. Spontaneous pain (day and night), pain on active movement, swelling and tenderness were assessed before and after the treatment period along with a physician's and patient's assessment of therapy at the end of the study. The vast majority of patients had a successful outcome whichever treatment they were taking. No patients reported any adverse effect during the study.

INTRODUCTION

Sulindac, a derivative of an indene acetic acid (indomethacin is an indole-acetic acid derivative), is a relatively new non-steroidal anti-inflammatory drug (NSAID). Its actions, characteristic for this group, include analgesia, anti-inflammatory and antipyretic activity. Sprain and strain injuries undoubtedly have an inflammatory component during the acute phase and logically lend themselves to treatment with NSAIDs in the hope of bringing about rapid relief of pain and inflammation and consequently improved function. Ibuprofen a non-steroidal anti-inflammatory drug has been shown to be effective in such cases as Muckle (1974); sulindac, however, has never been assessed in this area. It was therefore decided to study the relative merits of sulindac and ibuprofen in the treatment of sprains and strains, when used in clinical practice as an adjunct to conventional physical therapy. Most soft tissue injuries in the UK are seen and treated by family physicians and/or Accident and Emergency Departments. A large study in patients from general practice would require the co-operation of many general practitioners. This obviously introduces the inherent problems of multi-observers (Grayson, 1977) in clinical trials even if they are all

following a standard rigid protocol. Similar and more difficult problems could occur in Accident and Emergency Departments, where the likelihood of initial and follow-up examinations by the same officer is extremely remote. These problems could be overcome with a study centred on a practice likely to present a large volume of acute soft tissue injuries to a single observer. The Royal Military Academy Hospital at Sandhurst incorporates such a practice.

PATIENTS AND METHODS

Males over the age of 18 years with a diagnosis of acute unilateral sprains or strains of the ankle, hips, shoulders or knees based upon history and physical findings, who presented themselves to the Royal Military Academy Hospital at Sandhurst within 48 hours of onset were considered eligible for the study. Patients were excluded if they had only mild pain at the first examination, fracture or suspicion of fracture subsequently confirmed by X-ray, of any contraindication to the use of either drug as stated in the data sheets.

Patients satisfying the entry criteria were allocated, using a predetermined randomised schedule, to receive either sulindac (Clinoril) 200 mg twice daily or ibuprofen (Brufen) 400 mg three times daily for a period of 4 days. No concomitant anti-inflammatory agent or treatments other than those shown in Table I were permitted during the trial period.

At entry and after days 1 and 4 of the trial the

**Present address:*

Lt. Col. T. Bouchier Hayes,
Army Medical Reception Station,
Circular Road South,
COLCHESTER,
Essex.

TABLE I

Other treatment used during trial. N = 176

Treatment	Sulindac N = 93	Ibuprofen N = 83
Ice	23	19
"Robert Jones" compression bandage	8	1
Physiotherapy (mainly ultrasound used on a daily basis)	18	22
Quadriceps exercises	2	2
Elevation	4	4
Rest (cessation of all physical activity, but excluding bed rest or total immobilisation)	4	0
Ointment (anti-fungal cream)	1	1
Bandage	18	6
Number of extra treatments	78	55
Number of patients having extra treatment	48	46

following clinical assessments were made using the scales shown in Table II.

1. Spontaneous Pain (day and night ratings).
2. Pain on Active Movement.
3. Swelling.
4. Tenderness.

An overall evaluation of response to treatment was made by both physician and patient at the end of the 4 day study period according to the rating scales included in Table II. Adverse effects were monitored during the study.

RESULTS

A total of 176 patients, 93 of whom took sulindac and 83 who took ibuprofen, were included in the analysis. Initially 191 patients entered into the study; 96 of whom received sulindac and 95 ibuprofen, however, 15 patients were omitted subsequently from the analysis because of either protocol violation or failure to attend for reassessment.

The initial characteristics of the patients allocated to the two treatment groups are shown in Tables III and IV. The group taking sulindac tended to have a higher proportion of knee injuries in it than the group taking ibuprofen. Otherwise, the groups were reasonably balanced.

The measure of efficacy of the two treatments has been taken as the difference between the assessment scores immediately prior to starting medication, and those recorded on the final (4th) day of the study period.

TABLE II

Rating scales.

A. Spontaneous Pain (Day and Night)

0 = None	No spontaneous pain.
1 = Mild	Intermittent or constant pain but dull in character.
2 = Moderate	Either steady or intermittent but bearable pain.
3 = Severe	Steady and incapacitating pain.
4 = Very Severe	Intolerable pain.

B. Pain on Active Movement

0 = None	No or hardly any pain on weight bearing, no functional impairment.
1 = Mild	Mild pain on weight bearing, walking or lifting causes slight discomfort.
2 = Moderate	Moderate pain on weight bearing, walking or lifting causes considerable discomfort.
3 = Severe	Severe pain on weight bearing, walking or lifting impossible or with great difficulty only.
4 = Very Severe	Complete immobility.

C. Swelling

0 = None
1 = Slight
2 = Marked

D. Tenderness

0 = None
1 = Present
2 = Present and wincing
3 = Present, wincing and withdraws

E. Patient's and Investigator's Overall Evaluation of Treatment Efficacy

0 = Poor	None or hardly any effect.
1 = Slight	Some effect, but could be better.
2 = Fair	Satisfactory effect.
3 = Good	Good but not perfect.
4 = Excellent	Ideal, best possible effect.

TABLE III

Comparison of sulindac and ibuprofen at initial assessment.

		Sulindac N = 93	Ibuprofen N = 83
Injury	Knee	48	83
	Ankle	38	39
	Hips	3	7
	Other	4	4
Age	Mean	*22.0	**21.2
	Standard Deviation	6.5	5.4
Side	Left	37	32
	Right	52	50
	Both	1	0
	Not recorded	3	1
Hours after Trauma	Mean	21.8	20.7
	Standard Deviation	14.1	13.3
	Not recorded	1	0

* 2 ages not recorded

** 3 ages not recorded

Table V shows, for each efficacy parameter, the distribution of changes in the groups. A positive score is an improvement, a negative score is a deterioration. Thus, it can be seen that the majority of patients achieved a favourable response irrespective of which treatment was taken. A between-treatment comparison showed no significant difference ($p > .05$) in all cases (Mann-Whitney U-test). The mean rankings (Table VI) show that preference is divided equally between the two drugs over the different measures of efficacy. The improvement score is reflected in both the patient's and physician's overall evaluation of treatment (Table VII and VIII).

TABLE IV

Comparison of sulindac and ibuprofen at initial assessment.

	Score					N/R	N/A
	0	1	2	3	4		
Day Pain							
Sulindac	30	31	24	8	0		
Ibuprofen	30	16	31	5	1		
Night Pain							
Sulindac	43	22	8	5	0	4	11
Ibuprofen	38	14	17	2	0	1	11
Active Motion							
Sulindac	0	12	51	29	1		
Ibuprofen	0	9	41	32	1		
Tenderness							
Sulindac	3	29	33	28	0		
Ibuprofen	6	24	31	22	0		
Swelling							
Sulindac	40	29	22	2	0		
Ibuprofen	35	24	18	5	0	1	

N/R Not recorded

N/A Not applicable

Taking a fair, good or excellent effect as meaning a successful outcome then 72 of 93 (77%) patients taking sulindac judged themselves to have been treated successfully compared with 71 of 83 (85%) taking ibuprofen. In the view of the investigator the corresponding results were 68 (73%) successfully treated with sulindac compared with 61 (73%) of those on ibuprofen. No side effects were reported in the study.

DISCUSSION

This large study has shown that non-steroidal anti-inflammatory agents can be used beneficially as an adjunct to physical therapies in acute soft tissue injuries. In this particular study sulindac and ibuprofen proved to be equally beneficial. Of interest is the absence of any

TABLE V
Change in scores between Day 0 and Day 4.

	Change in Score							
	+4	+3	+2	+1	0	-1	-2	N/R N/A
Day Pain								
Sulindac	0	2	21	32	38			
Ibuprofen	1	1	29	17	33	2		
Night Pain								
Sulindac	0	3	7	22	45	1		4 11
Ibuprofen	0	0	17	14	40	0		1 11
Active Motion								
Sulindac	1	11	25	35	19	1		1
Ibuprofen	0	6	28	32	16	1		
Tenderness								
Sulindac	0	8	25	37	21	2		
Ibuprofen	0	4	19	38	20	2		
Range of Movement								
Sulindac	0	4	13	17	57	0	1	1
Ibuprofen	0	1	22	18	40	2		
Swelling								
Sulindac	0	1	10	33	45	2	1	1
Ibuprofen	0	0	9	27	45	1		1

N/R Not recorded

N/A Not applicable

adverse reactions reported by the patients taking either of the two therapies. This might be explained by two considerations. First the treatment period was relatively short and any adverse reactions may not have manifested themselves by the end of the trial and second, the population studied was a very selective one of young, fit, military personnel who presumably have a high "complaint" threshold and are highly motivated to return to active duty. There are, at any one time, approximately 700 officer cadets/student officers undergoing military training at the Royal Military Academy, Sandhurst. In general they are young, fit personnel who are required to participate in vigorous training and sporting activities. It is important that loss of time from training is minimised and therefore the object in treating any sporting/training injury is to return the subject to full duties as quickly as possible. This has been achieved by immediate first-aid, open access to medical opinion, the use of local supportive measures and physiotherapy and the administration of anti-inflammatory drugs. The authors recognise the contribution of "standard" treatments such as ice and compression to the relief of early pain, and thus to the overall responses of the patients receiving such concurrent therapy. A comparison between standard and anti-inflammatory treatment is currently being carried out in a different study.

In conclusion this study has demonstrated that sulindac has a place in the treatment of acute sprains and strains.

TABLE VI

	Mean Rank	No. of Patients	P-Values
Day Pain			
Sulindac	86.3	93	
Ibuprofen	91.0*	93	N.S.
Night Pain			
Sulindac	72.6	78	
Ibuprofen	77.6*	71	N.S.
Active Motion			
Sulindac	88.5*	92	
Ibuprofen	87.4	83	N.S.
Tenderness			
Sulindac	91.7*	93	
Ibuprofen	84.9	83	N.S.
Range of Movement			
Sulindac	83.2	92	
Ibuprofen	93.3*	83	N.S.
Swelling			
Sulindac	88.7*	92	
Ibuprofen	86.2	82	N.S.

* Indicates group with higher mean rank, i.e. group with better performance.

TABLE VII

Patients' evaluation of treatment efficacy.

	Score					
	0	1	2	3	4	N/R
Sulindac	2	15	15	40	17	4
Ibuprofen	4	6	19	40	12	2

TABLE VIII

Investigators' evaluation of treatment efficacy.

	Score					
	0	1	2	3	4	N/R
Sulindac	7	13	21	47	0	5
Ibuprofen	6	14	24	37	0	2

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