A LOCAL COOLANT ('SKEFRON'), FOR RELIEF OF PAIN

E. TOKE, M.B., CH.B.
Liverpool

Since the time of Hippocrates various forms of counter-irritation for the relief of pain have been widely used. The application of local heat is probably the most well-known method of treatment, but other measures, such as cold-compresses, mustard-plasters and the use of actual blistering of the skin have also had some vogue.

Gammon and Starr (1941) after using temperature changes, vibration, tactile and electrical stimulation in the relief of experimental pain induced in themselves by the subcutaneous injection of 10 per cent sodium chloride solution or the application of irritant ointments, concluded that ". . . by wise selection and periodic application of counter-irritants, much more relief can be secured than by the haphazard application of hot water bottles and ice bags. . . ."

Indications for use of counter-irritation

In 1935, Kraus, impressed by the need for mobilization of limbs affected by sprains and muscle-strains, used an ethyl chloride spray to reduce local pain and abolish reflex muscle spasm. Creer (1939) and Cozen and Hollombe (1940) reported on the successful use of this treatment for sprained ankles and other strains, and since that time there have been numerous other papers on this therapy. The extensive literature has been reviewed by Travell (1952), and this author describes the trigger-areas, cooling of which will relieve spasm in the muscles reciprocally innervated (Travell, 1949). The principle of the treatment depends upon the integrity of the sensory pathway from the trigger-area so that actual freezing of the skin is to be avoided, as pointed out by Ellis (1961a). This author describes the value of the treatment not only in acute lumbago, wry-neck and myalgia, but in such conditions as renal colic and spasmodic dysmenorrhoea, and discusses the possible mode of action, since in the latter conditions the theory of trigger-areas in the fascia or muscles is scarcely tenable. He also makes reference (Ellis 1961a and b) to other and safer coolants than ethyl chloride,

and mentions mixtures of fluoromethanes which have certain advantages.

Disadvantages of ethyl chloride

Ethyl chloride is relatively safe for hospital use, but it is impracticable to give it to patients for use in their homes owing to the fact that it is an anaesthetic and is toxic. It is inflammable, can freeze the skin easily—thus defeating the object of its use—and can produce local blistering.

Organic fluorides

Organic fluorides such as the fluoromethanes are very much less toxic than ethyl chloride (Yant, 1933). They have no anaesthetic action and are non-inflammable and therefore safe for prescription to patients for use in their homes. This paper concerns the use of Skefron, which is a mixture of dichlorodifluoromethane and trichloromonofluoromethane in the proportions of 15 and 85 per cent respectively.

Technique of use

The non-leak Skefron cannister contains 150 G. of coolant and delivers a jet at the rate of about 2 G. per second. This jet becomes a coarse spray at a distance of about 2 feet and it is recommended that the cannister be held at a distance of 1—2 feet from the affected area, spraying for from 3 to 5 seconds and repeating twice if necessary at intervals of half a minute. This treatment can be given up to three times daily if required, and the mixture of fluoromethanes has been adjusted so that freezing of the skin is not readily obtained.

Material

Skefron was used in the treatment of 41 patients from a general medical practice. There were 20 men and 21 women. Eleven were suffering from myalgia (" fibrositis ") of the shoulder girdle and eight from myalgia in other sites. Five had lumbar pain, two sciatica and four prolapsed intervertebral discs, five had wry-neck and four sprains or strains. Of the remaining two, one had osteoarthritis of the knee, and one extensive bruising of the buttocks after a fall. The diagnoses, number of treatments per day, and duration of treatment, together with the results, which have been classified as excellent, good, fair or poor, are presented in table I.

Results

In the final assessment, an excellent or good response was regarded as " satisfactory " and a fair or poor " unsatisfactory ". It will be seen that 32 of the patients responded satisfactorily and the

TABLE I

Diagnosis	Men	Women	Total no. of patients	Number of applications per day		Duration (days)		Results				Remarks
				Range	Mean	R	M	E	G	F	P	
Myalgia: Shoulder girdle	6	5	11	2–3	2.8	1–3	2	6	4	1	0	
Myalgia: Other sites	3	5	8	1–3	2.6	1–3	2.5	5	3	0	0	
Lumbar pain	1	4	5	2–3	2.8	1–3	2.4	3	1	1	0	
Sciatica (other than due to P.I.D.) ..	2	0	2	3	3	2–3	2.5	0	1	1	0	
Prolapsed intervertebral disc	1	3	4	3	3	1	1	0	0	1	3	
Wry-neck	3	2	5	1–3	2.6	1–3	2	4	0	1	0	2 Relapses (1 regarded as functional)
Sprains and strains	3	1	4	3	3	1–2	1.7	1	2	1	0	1 Relapse
Other	1	1	2	3	3	1–3	2	0	1	0	1	
TOTALS	20	21	41	1–3	2.8	1–3	2.0	19	12	6	4	

Satisfactory .. 31
Unsatisfactory 10
TOTAL .. 41

R = Range
M = Mean
E = Excellent
G = Good
F = Fair
P = Poor

remaining ten unsatisfactorily. Further reference to the table shows that 18 of the 19 patients with myalgia responded well as did four of the five patients with lumbar pain, four of the five with wry-neck, and three of the four with sprains or strains. Although the totals in the other groups are too small for any valid comment it does appear that patients with prolapsed intervertebral discs did not do well. Ellis (1961a) describes good results in the treatment of this condition, but these patients were treated in hospital and subsequent rest in bed was advised. Prolapsed intervertebral disc is not always ideally treated at home under the conditions of general practice.

It will be seen that two of the patients with wry-neck relapsed (though in one of these the spasm was thought to be functional in origin), and one of those with strained back-muscles, though she experienced relief for three days.

The application was needed from 1—3 times a day in most patients (mean 2.8) and the mean duration of treatment was 2 days.

Conclusion

Skefron has, in this series of 41 patients shown itself to be a safe and effective form of self-medication which was of value in the treatment of myalgia (" fibrositis "), wry-neck, and ligamentous sprains and muscle strains, met with in general practice.

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REFERENCES

Cozen, L. and Hollombe, B. S. (1940), *Surgery*, **8**, 468.
Creer, W. S. (1939), *Brit. J. phys. Med.*, **2**, 47.
Ellis, M. (1961a) *Brit. med. J.*, **1**, 250.
—— (1961b), *Practitioner*, **187**, 367.
Gammon, G. D., Starr, I. (1941), *J. clin. Invest.*, **20**, 13.
Kraus, H. (1935), *J. Amer. med. Ass.*, **104**, 1261.
Travell, J. (1949), *Mississippi V. med. J.*, **71**, 13.
—— (1952) *Arch. phys. Med.*, **33**, 291.
Yant, W. P. (1933), *Amer. J. publ. Hlth.* **9**, 930.