TRIAL OF A VASODILATOR ON TROPHIC ULCERS

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Introduction

We are faced with the problem of treating plantar trophic ulcers in leprosy. These cases occupy a larger number of hospital beds than cases such as lepra reaction or any other concurrent disease.

Treatments of the ulcers are many according to the extent of the lesion, discharge from the ulcer, and the involvement of the underlying bone. Ulcers without discharge or involvement of bone can successfully be treated with full cast plaster of paris bandage to the leg applied at the roadside clinic itself, but patients having chronic recurrent ulcers with marked oedema of the foot and serious discharge cannot be treated with plaster of paris immobilisation and they need prolonged hospitalisation and special treatment.

It is known that sclerosis and fibrosis lead to extra-vascular compression and narrowing of the blood vessels in the region of the trophic ulcers. DHARMENDRA, SEN, & CHATTERJI² hold that diminution in the blood supply is a fundamental cause of persistent ulceration.

LAURET and KERBASTARD³ treated 17 perforating ulcers with trichloracetic acid and salicylic acid externally and intravenous injection of Dycholium (dehydrocholate of sodium). They attribute the good results to the antiseptic and epithelial softening actions of the acid and the vasodilatation brought about by the bile salts.

PATERSON⁴ from a series of angiographs concluded that there is dilatation of the arteriovenous shunts and sometimes there is defective filling of the digital arteries due to short circuit of blood.

Hence it was felt that any drug which would increase the blood flow to the affected part might promote quicker healing of these ulcers. This led me to the trial of nicotinic acid, a vasodilator drug, in the treatment of plantar trophic ulcers which forms the subject of this paper.

Pharmacology

Pyridine B—carboxylic acid is nicotinic acid having the following formula:



Nicotinic acid is capable of producing marked vasodilation particularly of the capillary bed.

For the purpose of this trial Pelonin of the Glaxo laboratories was used.

Selection of material for study

Each case was selected on the following criterion:

Secondary infection and bony involvement were absent and the ulcers had serous discharge.

The patients were of all types of leprosy and all of them were on sulphone treatment.

The method

The patient was seated on a high stool with the leg hanging down and a pneumatic cuff of the sphygmomanometer was applied over the thigh at a pressure of 110 mg. of mercury. 100 mg. of nicotinic acid, i.e., two ampoules of 50 mg. Pelonin, each ampoule containing 2 ml. was injected into the long saphenous vein in the leg which had the ulcer, keeping the pneumatic tourniquet on for five minutes to prevent the drug from flowing proximally. The treatment was given only thrice weekly and the ulcers were dressed with dry sterile gauze on alternate days. The patients were not strictly confined to bed. They were not aware that a trial was being made.

As a control, a few cases were given 4 ml. of distilled water intravenously, instead of Pelonin.

The blood pressures of the individuals were recorded before and after the administration of the drug.

Results

In the nicotinic acid group, out of 18 ulcers, 4 healed within 10 days, 8 healed within 22 days, 3 healed in 30 days and the rest within 60 days. Whereas in the control group with distilled water, out of 9 ulcers, only 2 healed within 30 days and the rest did not show any sign of improvement even after 30 days.

Nicotinic acid group—See table I.

Control group—See table II.

S. No.	Name	Sex and Age	Туре	Site of ulcer	Size of ulcer (Length × Breadth × Depth)	Duration of Ulcer	Duration of Treatment	No.of Injec- tions given	Remark	TRIAL
1	S.	Male/30	Polyneuritic	Lateral edge of foot						OF
				4th and 5th metatarsals	4 cm \times 3 cm \times 1 cm	3 years	60 days	24	Healed	>
2	С.	Male/60	Polyneuritic	Head of 2nd metatarsal	2 cm \times 2 cm \times 5 mm	l year	11 days	5		VA.
3	V .	Female/37	Polyneuritic	Heads 2nd, 3rd and 4th						SOL
				metatarsals	3 cm \times 2 cm \times 1 cm	9 months	41 days	15	,,	ĨĽ,
4	L.	Male/25	Tuberculoid	Head of 2nd metatarsal	4 mm \times 3 mm \times 2 mm	7 months	30 days	12		TO
				Head of 5th metatarsal	1 cm \times 1 cm \times 1 mm	7 months	20 days	9	,,	R
5	Α.	Male/29	Polyneuritic	Head of 1st metatarsal (New)	1.5cm \times 1.5cm \times 9 mm	6 months	25 days	10		
6	Α.	Male/35	Borderline	Head of 1st metatarsal	$2.5 \text{cm} \times 2.5 \text{cm} \times 2 \text{ cm}$	5 months	22 days	9	,,	
				Heads 3rd, 4th metatarsals	$2.5 \text{cm} \times 2.5 \text{cm} \times 1 \text{ cm}$	4 months	14 days	6		
7	S.	Male/16	Borderline	Heads of 3rd, 4th metatarsals	1 cm \times 1 cm \times 1 cm	3 months	23 days	9	**	
8	К.	Male/15	Indeterminate.	Head of 2nd metatarsal	2 cm \times 1.5cm \times 1 cm	2 months	16 days	7	**	
9	D.	Male/43	Lepromatous	Head of 1st metatarsal	$1 \text{ mm} \times 1 \text{ mm} \times 1 \text{ cm}$	2 months	10 days	4	**	
10	Ρ.	Female/28	Tuberculoid	Shaft of 5th metatarsal	2 cm \times 2 cm \times 1 mm	2 months	7 days	3	>>	
				and Heel	2 cm \times 2 cm \times 2 mm	30 days	10 days	4	>>	
11	К.	Male/35	Lepromatous	Base of terminals phalanx						
				of great toe	$1 \ \mathrm{cm} \times 1 \ \mathrm{cm} \times 1 \ \mathrm{mm}$	2 months	33 days	13	,,	
12	D.	Male/32	Tuberculoid	Head of 2nd metatarsal (New)	1.3 cm \times 1 cm \times 1 cm	2 months	5 days	2	,,	
13	С.	Male/39	Lepromatous	Heads of 4th, 5th metatarsals	3 cm \times 2 cm \times 1.5cm	2 months	45 days	16	""	
14	Α.	Male/31	Tuberculoid	Base of terminal phalanx						
				of great toe	$2.6 \text{cm} \times 1.9 \text{cm} \times 1 \text{ cm}$	45 days	19 days	8	,,,	146
15	К.	Male/36	Tuberculoid	Base of terminal phalanx						
				of great toe	$1.5 \text{cm} \times 1 \text{ mm} \times 2 \text{ mm}$	45 days	14 days	6	>>	

TABLE I	

Side effects

Soon after releasing the cuff, in the nicotinic acid group, all of them had flushing and some had gastric discomfort, which lasted for a few minutes.

Discussion and conclusions

The results with nicotinic acid were encouraging. Fresh crops of healthy granulation tissue were seen sprouting up in the ulcers on the third day. As seen in table I, ulcers of short duration and the first ulcers healed rapidly. 11 patients who were admitted for skin diseases who had also ulcers without bony involvement were given Pelonin 100 mg. daily orally as part of their treatment for the skin disease. It was noted that these ulcers took on an average about two months to heal in spite of local dressings. CAVER¹ tried Roniacol, a vasodilator orally in 3 plantar ulcers and found no significant improvement. Ulcers treated with distilled water also took a long time to heal and healthy granulation tissue as seen in ulcers treated with nicotinic acid was not present.

These findings lead me to conclude that:

- 1. Vasodilatation plays a greater part than previously thought in healing of the ulcers.
- 2. Nicotinic acid is a useful drug for the treatment of plantar ulcers.
- 3. Nicotinic acid given intravenously has a better effect than administered orally.

Summary

- 1. A vasodilator, nicotinic acid (Pelonin) was tried intravenously for the treatment of plantar trophic ulcers without local dressings.
- 2. 15 persons with 18 ulcers were put on nicotinic acid.
- 3. 5 persons with 9 ulcers were kept as control with distilled water injections.
- 4. 11 cases were treated with nicotinic acid orally.
- 5. Healing of the ulcers were quicker in the nicotinic acid group (intravenous), and the first ulcers more rapidly.

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TABLE II								
S.	Name	Sex and	Туре	(CONTROL GR Site of ulcer	OUP) Size of ulcer (Length × Breadth	Duration of	Duration of	Remark
<i>No</i> .		Age			× Depth)	Ulcer	Ireatment	
1	S.	Male/38	Lepromatous	Head of 1st metatarsal	$2~cm \times 1~cm \times 2~mm$	20 days	60 days	Not healed
2	М.	Male/42	Lepromatous	Head of 3rd metatarsal	2 cm \times 2 cm \times 1 mm	6 months	45 days	"
				Head of 1st metatarsal	2 cm \times 2 cm \times 3 mm	2 months	30 days	**
				Shaft of 3rd metatarsal	$1 \text{ mm} \times 1 \text{ mm} \times 0.2 \text{cm}$	2 months	30 days	**
3	Р.	Male/40	Tuberculoid	Head of 2nd metatarsal	1.5cm \times 1 $$ cm \times 1 $$ cm	6 months	60 days	>>
				Heel	$2.5 \text{cm} \times 2 \text{ cm} \times 2 \text{ cm}$	6 months	60 days	"
4	Μ.	Male/45	Tuberculoid	Head of 5th metatarsal (New)	$1~\text{cm}\times2~\text{cm}\times0.2\text{cm}$	1 month	28 days	Healed
5	G.	Male/39	Tuberculoid	Head of 1st metatarsal (New) Head of 5th metatarsal (New)	$\begin{array}{c} 3 \hspace{0.2cm} cm \hspace{0.1cm} \times \hspace{0.1cm} 3 \hspace{0.2cm} cm \hspace{0.1cm} \times \hspace{0.1cm} 2 \hspace{0.2cm} mm \\ 2 \hspace{0.2cm} cm \hspace{0.1cm} \times \hspace{0.1cm} 1.5 cm \hspace{0.1cm} \times \hspace{0.1cm} 1 \hspace{0.2cm} mm \end{array}$	l month 1 month	30 days 30 days	N ot healed Healed

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