

## A Follow-up Study of Leg and Foot Ulcer Patients

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Three hundred and fifty patients treated in 1980 at the Department of Dermatology for leg and foot ulcers were asked to come for an interview concerning the development of their ulcerations up to the end of 1983. Forty-five of 186 patients were free from ulcers from 1981 to 1983. Thirty patients had leg ulcers continuously throughout the period and their ulcers were not healed at any time. Ninety-six patients had died during the follow-up period, and the total mortality rate compared to an age-matched population was shown to be approximately doubled for both men and women. When analysing the causes of death, it was found that the ischemic heart disease mortality rate was twice that of the age-matched population but the mortality rate for malignant diseases was about the same. *Key words: Epidemiology; Leg ulcers; Mortality.* (Received April 13, 1987.)

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In 1980 we estimated the prevalence of leg and foot ulcers in Gothenburg to be 0.2-0.4% on the basis of a survey among different medical specialities (1). Current knowledge concerning the outcome for leg and foot ulcer patients is limited. The recurrence rate for venous leg ulcers is reported to be as high as 49% in 3 months and 69% within a year (2). Venous ulcer patients treated surgically with ligation of incompetent calf-perforating veins had an ulcer recurrence rate of 55% in five years (3). We decided to make a follow-up study of 350 patients who in 1980 had attended the Department of Dermatology at Sahlgren's Hospital in Gothenburg. The patients were asked how their leg ulcers had healed and whether these had recurred during the three following years until the end of 1983. Certain data were collected from the medical records.

### MATERIAL AND METHODS

Three hundred and fifty patients treated during 1980 for leg ulcers at the Department of Dermatology, Sahlgren's Hospital, Gothenburg, were asked to come for an interview in 1984. Patients not replying to the first letter were sent a second letter and if no reply was received the second time the reason for this was looked into. Table I gives the number of patients who came for an interview in 1984 and the remaining patients' reasons for not coming.

The patients were interviewed to find out if they had been free from ulcerations during 1981, 1982 and 1983 and whether they had ulcers at the end of 1983. If they had had ulcers all three years, they were also asked if they had had the ulcerations continuously.

The routine in our department is that patients who have a clinically typical picture of venous ulceration, without pain and with well palpable pulses, are not routinely further investigated as to their arterial circulation. When arterial insufficiency is suspected, the usual procedure is to measure the systolic arm, ankle and toe pressures.

Among the 350 patients attending the Department of Dermatology in 1980, 107 had their systolic ankle and toe pressures measured. Sixty-four of the 254 patients (25.2%) alive when the study was completed and 28 of those 96 patients (29.2%) who died had been examined in this way. These data were collected from the medical records, as were data for those patients who died during the observation period.

The 96 deaths were classified with respect to the primary cause of death with the help of the National Central Bureau of Statistics in accordance with the 1965 Revision of the International

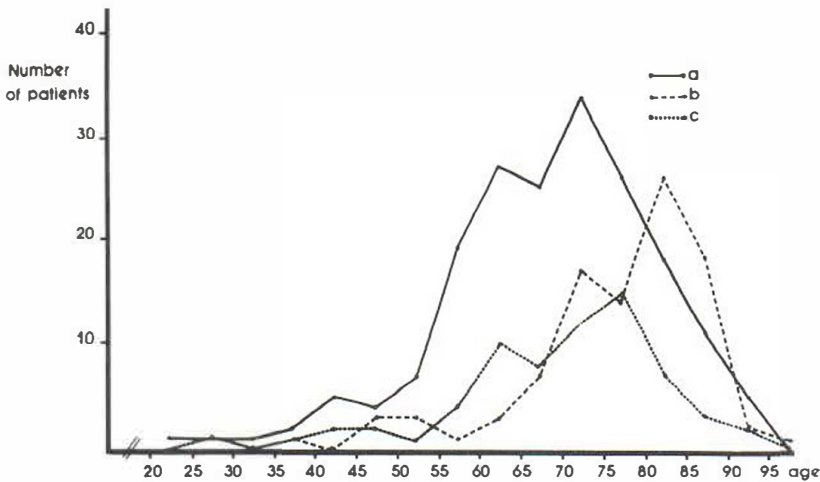


Fig. 1. Age distribution in 1980 for (a) 186 interviewed patients, (b) 96 deceased patients, and (c) 68 remaining patients.

Statistical Classification of Diseases, Injuries and Causes of Death (ICD 8th Revision), based on medical death certificates (4). For ischemic heart disease A 83 and for malignancies A 45–A 60 in the ICD list A were selected for observed and expected deaths.

The observed mortality was compared with expected mortality in the following way: for each 5-year age-group, the mean number of deaths per year ( $d$ ) and mean population ( $M$ ) were obtained from official statistics for the City of Gothenburg for the year 1982 (4). Separate calculations were made for males and females. The observation period with regard to mortality was 3.5 years. From these numbers, the annual risk

$$\mu = d/(M + d/2)$$

and the expected number of deaths

$$n(1 - e^{-\mu T})$$

were computed, where  $T$  = observation period (= 3.5 years) and  $n$  = number of patients ( $e$  = Euler's constant).

## RESULTS

The age distribution of the leg ulcer patients in 1980, who were interviewed in 1984, and of those patients who died during the period 1980–1983, is given in Fig. 1.

Table 1. Response rate and reasons for non-participation in 350 patients treated for leg and foot ulcers at the Department of Dermatology in 1980 who were asked to come for an interview in 1984

	Men	Women
Gave a complete interview	65	121
Came for the interview but could not answer all questions satisfactorily	12	17
Died 1980–1983	35	61
Could not be found	1	3
Alive at the end of the study but did not want to be interviewed	10	25
Total	123	227

Table II. Sex and age distribution in 1980 of leg and foot ulcer patients from the Dermatology Department compared to patients from all medical specialities

	No. of men	Median age of the men in years	No. of women	Median age of the women in years
Leg ulcer patients from the Department of Dermatology	123	69.0	227	74.5
Leg ulcer patients in study (1) from all medical specialities	370	70.2	570	76.0

The sex distribution and median ages for the patients in this study compared to the patients from different medical specialities in a previous study are given in Table II (1). The median ages are approximately the same in the two groups.

The patients were asked during how many years from 1981 to 1983 they had been completely free from leg ulcers. These data are given in Table III, together with the median ages for the different groups. Thirty patients (16.1%) had their leg and/or foot ulcers during the whole period.

Information on the presence of leg and/or foot ulcer(s) at the end of the study could be obtained from 208 patients. Sixty-two patients (30%) had an ulcer, 108 patients (52%) had no ulcer and the rest were uncertain.

The large number of patients that had died during the observation period made us suspect that there was an increased mortality risk among our leg and foot ulcer patients. Table IV gives the observed and expected number of deaths, indicating an approximately doubled risk for the group of patients studied. Table IV also gives the death rates from ischemic heart disease and malignant diseases. It was found that the risk of dying of ischemic heart disease was approximately doubled but the risk of dying of malignant disease was roughly the same as for the population of Gothenburg.

The measured systolic toe blood pressures in 64 of the 254 patients alive at the end of 1983 showed normal values in 33% (42/128 legs). In 28 of the 96 patients that died during the observation period the systolic toe blood pressures were measured and were normal in 2% (1 leg/56 legs).

Table III. Sex distribution and median age (1980) in relation to number of leg ulcer free years during the period 1981-1983

An ulcer-free year means no leg ulceration at all that year. A year not free can mean anything from a very short period of ulceration to ulceration(s) throughout the year

No. of ulcer-free years	No. of men	Median age of the men in years	No. of women	Median age of the women in years
3	19	62	26	68
2	7	68	16	70
1	10	66	27	72
0	29	71	52	73
Total	65		121	

Table IV. *Expected and observed mortality rates for men and women*

Age	Men		Women	
	Expected mortality rate <sup>a</sup>	Observed mortality	Expected mortality rate <sup>a</sup>	Observed mortality
<i>Total mortality</i>				
25-49	0.10	1	0.07	1
50-59	0.63	3	0.28	1
60-69	2.85	2	1.57	1
70-79	6.04	10	8.86	17
80-89	8.17	17	16.49	28
Total	17.8	33	27.3	48
<i>Ischemic heart disease</i>				
25-49	0.02	0	0.00	0
50-59	0.24	1	0.02	0
60-69	1.04	0	0.34	1
70-79	2.62	3	3.19	6
80-89	3.91	10	7.20	12
Total	7.82	14	10.8	19
<i>Malignant diseases</i>				
25-49	0.02	0	0.03	0
50-59	0.16	1	0.15	1
60-69	0.90	1	0.69	0
70-79	1.49	1	2.24	2
80-89	1.85	1	2.36	4
Total	4.43	4	5.48	7

<sup>a</sup> Calculated for 3.5 years.

Patients above the age of 90 years are excluded since no official statistics are available for this age group.

## DISCUSSION

The fate of leg ulcer patients treated at the Department of Dermatology has been investigated in this study. In a previous study, an attempt was made to characterize the total leg and foot ulcer population in Gothenburg (1). The median age and sex distribution of the patients from the Department of Dermatology differed very little from those of all patients (Table II).

Only 45 of the 186 patients (24.2%) whose ulcers in 1980 healed and who survived had no recurrence during the subsequent three years. As many as 81 of the 186 patients (43.5%) had leg and foot ulcers at some time in each of these three years. Thirty patients (16.1%) had ulcers continuously throughout the period and their ulcers were not healed at any time.

During the follow-up period of 3.5 years, 96 patients (28%) died. The total mortality rates for the foot and leg ulcer patients in our study were about twice as high as for the population of Gothenburg in the same age intervals for both men and women. The observed mortality rates from ischemic heart disease were also twice as high as expected in the population of the same age, while the mortality rates for malignant diseases were the same.

The fact that less than a third of the patients in the living and the deceased group had their systolic toe and ankle pressures measured makes it impossible to draw any definite conclusions. However, in the deceased group a normal systolic toe pressure was recorded in only one leg while in the surviving group about a third of the values were normal of those investigated.

In several studies of peripheral arterial insufficiency, it has been shown that the patients have a shorter than normal life expectancy (5, 6, 7).

Our conclusion is that the mortality rate is approximately doubled in leg and foot ulcer patients and the chances of their being free from leg ulcers throughout a coming three-year period are relatively small.

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