

# Patients with a 'diabetic foot'

## Prevention, diagnostics and therapy as seen by general practitioners

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**Abstract** The 'diabetic foot' in diabetes mellitus type II-patients is usually treated only marginally by GPs. There are hardly any relevant data on its prevention, diagnostics, and therapy. Out of a total of 2876 general practitioners in the State of Hesse, Germany, a stratified sample of 284 was interviewed by mail in 1992 (response 32 per cent). In therapy there are basically four regimens in general practice using diet, oral antidiabetics and insulin. Recent surveys indicate that more than three quarters of the diabetic foot conditions are primarily or solely of polyneuropathic origin, a fact most doctors interviewed misjudge entirely. Diagnostics and therapy usually lack a systematic approach. Only one third of the doctors apply neurological tests when examining the patient. Generally, a polypragmatic therapeutic approach is prevalent; however, the diabetic foot condition is not sufficiently attended to. Proper instruction on adequate care for the impaired foot is not provided. The physicians attributed their mostly negative attitude towards group-education on diabetes for patients primarily to lack of time, as well as a low compliance on the patient's side.

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### Introduction

Due to the steadily growing number of middle-aged people in the overall population, GPs tend to see an increasing number of patients with non-juvenile diabetes mellitus type II. The median age of these patients is about 66 years; the prevalence of diabetes mellitus type II is estimated at 4-5 per cent of the population.<sup>1-3</sup>

Late complications generated by a continuously or intermittent inadequate metabolism – retinopathy, nephropathy, and neuropathy – usually occur after more than 10 years, and often remain undetected, as long as they are asymptomatic.<sup>4-6</sup> Although polyneuropathy of type II-diabetics is perceptible at an earlier stage than other late complications, the 'diabetic foot' as a typical accompanying lesion is generally treated only marginally. Every second non-traumatic amputation is performed in diabetics, and diabetics have an amputation 30 times more often than non-diabetics.<sup>7,8</sup> Of all diabetics, 15 per cent will develop a diabetic foot, and of these people about 40 per cent will have an amputation in their lifetime; this is about 6 per cent of all diabetics.<sup>9-10</sup> However, carefully directed prevention, diagnostics and therapy combined with patient training could prevent more than half of these amputations.<sup>11,12</sup>

Relevant data on the prevention, diagnostics, and therapy of diabetic feet in general practice would be the fundamental basis for successfully designing, introducing and implementing effective quality assurance. Unfortunately such data are hardly available.<sup>13</sup>

This is a report of an exploratory study on quality assurance in general practice that was conducted in 1992 in Germany, with the following objectives:

- to observe and examine the quality status of medical care for patients with a diabetic foot;
- to identify and analyse problems.

### Methods

Out of a total of 2876 general practitioners in the State of Hesse, Germany, a multiple

stratified, cleaned sample of 284 has been interviewed by mail, by means of a four-page questionnaire. The survey took place in January and February 1992. Four open, five half-open, five closed and seven demographic questions dealt with the daily routine of prevention, diagnostics and therapy in patients with a diabetic foot.

### Results

The response rate of the questionnaire was 32 per cent (n=91). In the plausibility control the sociodemographic data of the responders coincided exactly with the sample and the basic group.

The rate of prevalence yields an average of 4 patients per practice with a diabetic foot over the last three months, with a peak among patients aged 61-70.

In therapy, basically four regimens are used:

- Dietetic measures alone are prescribed by 35 per cent of the respondents to less than 16 per cent of their type II-diabetes patients; 64 per cent of the respondents treat less than 26 per cent of their diabetic patients with diet only (*table 1*).
- The combination of oral antidiabetics and dietetic control is prescribed by 52 per cent of the GPs to more than 45 per cent of their patients; there is a peak around 50 per cent of all patients (*table 2*).
- Furthermore, 49 per cent of the respondents treat less than 16 per cent of their patients with diet plus insulin; 80 per cent of the responders give this regimen to up to 25 per cent of their patients (*table 3*).
- A combination of diet, oral antidiabetics and insulin is used by 82 per cent of the GPs, only in less than 16 per cent of their patients.

Recent surveys indicate that more than three quarters of the diabetic foot conditions are primarily or solely of peripheral sensomotoric and/or autonomic polyneuropathic origin.<sup>8,10,11</sup> Most respondents misjudge this fact entirely. The correct figure

**Table 1** Percentage of GPs treating their patients solely with dietetic measures

Percentage of all patients	Percentages of GPs n=72
≤15	35
16-25	29
26-35	10
36-45	11
46-55	7
56-65	7
66-75	—
76-85	—
86-100	1

**Table 2** Percentage of GPs treating their patients with diet and oral antidiabetics

Percentage of all patients	Percentages of GPs n=72
≤15	3
16-25	13
26-35	17
36-45	15
46-55	24
56-65	15
66-75	11
76-85	1
86-100	1

**Table 3** Percentage of GPs treating their patients with diet and insulin

Percentage of all patients	Percentages of GPs n=72
≤15	49
16-25	31
26-35	13
36-45	6
46-55	1
56-65	1
66-75	—
76-85	—
86-100	—

(65 to 85 per cent of all diabetic feet) is known to only 17 per cent of the general practitioners.

Only one third of the doctors apply any

neurological tests when examining the patient (table 4). On the other hand, 43 per cent of the GPs and 18 per cent of all mentions in this open question are concerned with Doppler sonography of leg arteria instead of simply palpating the temperature of the skin, which only 6 per cent performed. 'Take off their shoes and stockings!' may be the most important diagnostic approach, but only a few doctors think of it.<sup>14</sup>

**Table 4** Diagnostics in diabetic foot patients in 77 GPs' practices. Percentages of all 181 mentions

History taking	4
Physical examination	14
Inspection	3
Palpation	6
Foot pulse	2
Doppler sonography (GP or specialist)	18
Angiology (specialist or hospital)	10
Sensitivity, vibration, reflexes	7
Tuning fork	6
Neurological examination	7
Laboratory	11
Others	1

In therapy, only 3 per cent consider relief of pressure or immobilization, and only 5 per cent an effective systemic antibiotic treatment (table 5). Instead, 53 per cent of all mentions, coming from 62 per cent of

**Table 5** Therapy in diabetic foot patients in 78 GPs' practices. Percentages of all 295 mentions

Intravenous and oral therapy including antibiotics	53
Local therapy	24
Diet	1
Medical chiropody	3
Wound toilet/debridement of necrosis	4
Advice/footwear	2
Exercises	3
Reduction of pressure/footwear	3
Referral to diabetes hospital	0,3
Control of diabetes	5
Others	2

all respondents, were concerned with intravenous and oral therapies with so-called circulation stimulating drugs and pills against polyneuropathy.

## Discussion

Written interviews with open and half-open questions can only reflect opinions and self-assessment as well as knowledge of the responders. Due to this argument and to the restricted response rate the results of this study should be seen as no more than a tendency.

The rate of prevalence given by the responding GPs is too low when matched against comparative data (10-15 per cent of all diabetics over 60).<sup>9,11</sup> German GPs care for an average of 60-80 diabetics per practice, whom they usually see every three months.

The therapeutic pattern of diet, oral antidiabetics and insulin in the treatment of patients with diabetes mellitus type II is identical with the results of other surveys, though it does not give any information on the quality of metabolic control by the GP (e.g. HbA<sub>1c</sub>-test). In Germany about 3-4 per cent of the population use oral anti-diabetics (sulfonylurea). Dietetic measures are not exhausted sufficiently, and therapy with sulfonylurea often starts simultaneously with the first diagnosis of diabetes.<sup>2</sup> Similar problems are reported from Sweden.<sup>16</sup> Although a polypragmatic therapeutic approach is prevalent in our study, the diabetic foot condition is not sufficiently attended to. The predominant intravenous and oral therapies for stimulation of circulation and against polyneuropathy are ineffective and generate an immense cost factor in the care for diabetics.<sup>8</sup>

The basic therapy in type II-diabetics should be an intensive counseling and training program for individuals and groups, before any drugs are administered.<sup>15</sup> Effective instruction and training of the patient is the best prevention for diabetic feet. Since July 1991, GPs in Germany can offer a structured instruction and training group program for type II-diabetics not treated with insulin; it is divided into four sessions in four weeks and ex-

penses are reimbursed by the health insurances.<sup>1</sup> Topics are for instance diet and body weight, physical exercise, urine self-control, foot care and proper shoes. But in the first quarter of 1992 only 4 per cent of the physicians in Hesse took advantage of this extra fee by offering the program to their patients. The physicians attributed their mostly negative attitude primarily to lack of time (35 per cent of the respondents), as well as a low compliance on the patient's side (25 per cent). Only 7 per cent stated financial reasons.

Discrimination between polyneuropathic and ischemic origin of diabetic feet is very important with regard to an adequate therapy. The more frequent polyneuropathic-infected diabetic foot requires complete immobilization, disinfection of the wound as well as systemic antibiotic treatment.<sup>17</sup> The ischemic-gangrenic diabetic foot with moderate arterial contraction should be treated with scheduled walking training and needs the input of a vascular surgeon.<sup>18,19</sup> The polyneuropathic diabetic foot can easily be diagnosed by means of history taking, for example paraesthesia or numbness, lowered or missing sensitivity for vibration tested with a tuning fork, missing Achilles reflex, painless lesions at a spot put under pressure, and a warm, rosy skin with palpable pulses.<sup>7</sup>

In a study carried out by general practitioners in The Netherlands, neuropathy signs and symptoms were present in 68 per cent of NIDDM-patients. Most frequently, both Achilles reflexes were absent. This was the only sign in 19 per cent of the patients which raises some doubts as to whether these patients actually suffered from neuropathy, because in the non-diabetic population the prevalence of this sign is 20 per cent. Ulceration on a foot

was present in 1.7 per cent, non-traumatic amputation in 1.3 per cent of the diabetes patients; less severe lesions of the feet belonging to the syndrome 'diabetic foot' were not reported.<sup>4</sup> Comparable studies in the USA show signs and symptoms of neuropathy in 10-100 per cent of all diabetics depending on criteria, diagnostic methods and defined populations.<sup>20</sup> Comparison with controls reveals a higher prevalence of other late complications in the presence of a diabetic foot.<sup>21</sup>

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