

Choice of level in lower extremity amputation —nationwide survey

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Abstract

This survey analyses the levels of all major lower limb amputations in Denmark performed in 1980. During that year a total of 2,404 amputations were carried out on 2,177 patients.

Introduction

Generally the title: "Choice of Level in Amputation" evokes associations of clinical or technical aids in choosing the proper level. Most, if not all, publications on lower limb amputation are garnished with tabulations of the levels chosen. Their quality notwithstanding, such publications are invariably based upon highly selected population samples. It is often attempted from the samples, with the application of more or less sophisticated statistical tools, to deduce a "general" picture. Until now it has not been possible to verify such generalizations.

The present study describes the nationwide pattern of lower limb amputation in Denmark.

Method and material

Since 1976 the Danish State Board of Health has collected information on all hospital admissions in the country.

The individual patient records are fed into a computer system, the so-called National Patient Register (NPR).

For scientific study individuals and medical organizations may obtain specified listings of the NPR, stored on magnetic tape or printed out according to the needs of the requestor. Naturally a strict set of rules must be adhered to, in order to maintain the privacy of the individual.

Since 1972 the Danish Amputation Register (DAR) has conducted studies in all aspects of amputation (Eskov, 1977). Originally the major source of information was voluntary reports from orthopaedic and surgical departments. In recent years the DAR has had access to the relevant material obtainable from the NPR.

The actual tabulations and analyses are performed on a microcomputer-system (Apple II Plus), hooked up to the mainframe (CDC Cyber) of the State University Hospital (Rigshospitalet) in Copenhagen.

The study is based upon information of all major (i.e. at or proximal to the transmetatarsal level) amputations during the year of 1980.

Results

During 1980 2,404 major amputations were carried out in 2,177 patients (Table 1, Fig. 1).

In the majority, 88.2%, the indication was vascular insufficiency. One third of these patients suffered from diabetes mellitus. Trauma

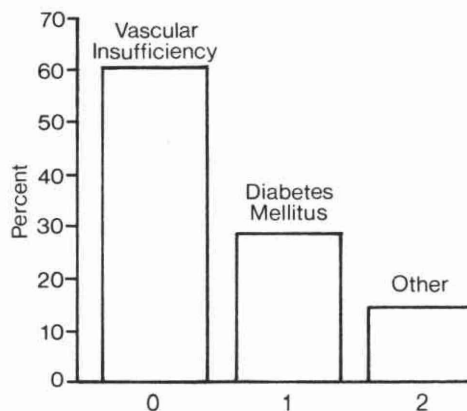


Fig. 1. Etiology.

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Table 1. Total number of amputees and amputations during 1980. Distributed by etiology.

	Patients	Amputations	
01 Vascular Insufficiency	1319	1457	60.6%
02 VI+Diabetes Mellitus	601	672	27.6%
03 Trauma	94	97	11.8%
04 Benign Tumour	0		
05 Malignant Tumour	33	34	
06 Congenital Deformity	6	6	
07 Congenital Amputation	0		
08 Infection	47	55	
09 Pseudoarthrosis	0		
10 Miscellaneous	77	83	
Totals	2177	2404	

only accounted for four per cent of all amputations.

For the most significant etiologies, i.e. groups 1 and 2, details are given regarding age and sex distribution (Figs. 2 and 3), level of amputation (Tables 2 and 3), duration of hospitalization (Figs. 4 and 5) and details of dismissal from hospital, including intranosocomial mortality (Tables 4 and 5).

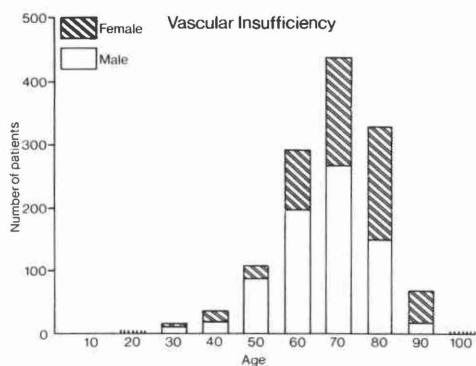


Fig. 2. Vascular insufficiency related to age and sex.

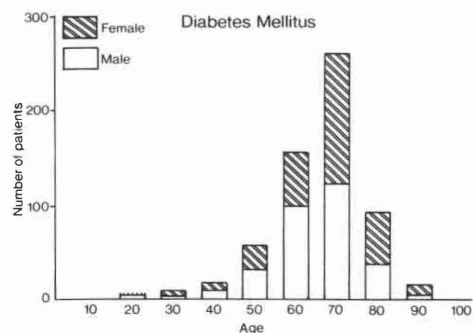


Fig. 3. Diabetes mellitus related to age and sex.

Table 2. Level of amputation for vascular insufficiency.

Level	1	2	3	Total	%
Foot	36	6	2	44	3.0
Syme	5	1		6	0.4
B K	480	51	6	537	36.9
T K	30	6		36	2.5
A K	768	61	5	834	57.2
Totals	1,319	125	13	1,457	

Amputees with vascular insufficiency (VI), without or with concomittant diabetes mellitus (DM), belong in the older age groups, 8 and 9, respectively 87% being more than 60 years old.

The sex distribution is surprisingly similar in both groups, with males accounting for 51 (DM) to 58 (VI) per cent of the total.

The level of amputation is obviously different from patients with simple vascular insufficiency to diabetics. In the former, amputation at foot level was carried out in 3.4% of patients, in the diabetic group in 10.9%. Below-knee amputation was carried out in more than half of the diabetic patients (53.6%), versus one third (36.9%) in those with simple VI. Correspondingly, 57.2% of the VI patients were amputated above the knee, versus only 34% in the DM group.

It is striking that the rate of through-knee amputation was respectively 2.5% and 1.5%. Considering the excellent prostheses available to TK amputees, the application of this type of surgery is surprisingly rare.

An assessment of levels of amputation in females and males respectively shows that within the same etiological group there is virtually no difference.

Tables 2 and 3 show the number of patients, operated one to three times during the same admission. Since the NPR does not hold information on the date of operation, nor on laterality, it is not possible, based upon the

Table 3. Level of amputation for diabetes mellitus.

Level	1	2	3	Total	%
Foot	66	4		70	10.4
Syme	3			3	0.5
B K	317	42	1	360	53.6
T K	9	1		10	1.5
A K	206	20	3	229	34.0
Totals	601	67	4	672	

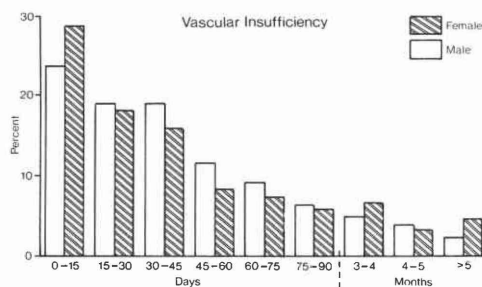


Fig. 4. Vascular insufficiency, duration of stay in hospital.

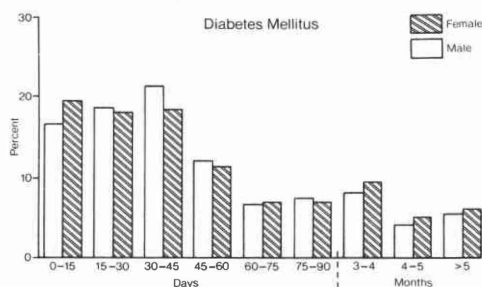


Fig. 5. Diabetes mellitus, duration of stay in hospital.

present material, to extract details of the absolute incidence of contra- or ipsilateral re-amputation. This topic was analysed in an earlier work (Ebskov, 1980).

The duration of hospitalization was tabulated for males and females. It turns out that in VI as well as in DM there is a remarkable similarity between the sexes. Approximately 40% of all amputees were dismissed before the end of the first postoperative month and about 75% of all prior to the elapse of 2 months.

Similarly a large number of patients (better than 40%) were dismissed directly to their own home. About 15% had to be transferred to a nursing home. These findings seem rather remarkable considering the large number of older patients in these etiological groups. Since patients in Denmark are not charged for the admission or treatment, economical considerations on the part of the patients cannot be the explanation.

The intranosocomial mortality was slightly above 10% in both groups, again with no convincing difference between the sexes. The

lapse of time from amputation to death in hospital has not been analysed.

Table 4. Dismissal (including mortality)—vascular insufficiency.

	M	F	Total	
Home	314	252	566	42.9%
Other Department	149	105	254	
Other Hospital	82	56	138	
Nursing Home	122	82	204	15.5%
Recreation	7	3	10	
Miscellaneous	2	1	3	
Dead	88	56	144	10.9%

Table 5. Dismissal (including mortality)—vascular insufficiency with diabetes.

	M	F	Total	
Home	138	121	259	43.1%
Other Department	50	56	106	
Other Hospital	48	23	71	
Nursing Home	35	58	93	15.5%
Recreation	2	1	3	
Miscellaneous	2	1	3	
Dead	34	31	65	10.8%
Unknown		1	1	

Conclusion

The present study represents solely a superficial scanning of the National amputation patterns. At present more detailed studies are under way.

It is anticipated that the Danish Amputation Register can contribute not only significant details of many aspects of amputation, but furthermore in the future open the possibility of trend analyses.

Acknowledgement

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