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Epidemiologic data of trauma-related lower limb amputees: A single center 10-year experience

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ABSTRACT

Objective: The aim of this study is three fold: 1) to introduce epidemiologic data of patients with trauma-related amputations as a 10-year experience of a rehabitation center; 2) to determine comorbidities and secondary conditions of lower limb loss; 3) to determine the rehospitalization reasons for lower limb amputee patients.
Materials and methods: This retrospective study was conducted in a tertiary rehabilitation center in Turkey. Clinical and demographic data of amputees including sex, age, employment status, time since amputation, time after amputation to first hospitalization, length of hospitalization, how many times the patient was hospitalized, reason for hospitalization, stump complications, comorbid conditions, amputation level and K classifacation were documented.
Results: Three hundred ninetynine patients with a mean age of 23,48 ± 6,04 (4–74) years were included in this study. Mean duration after amputation was 119,71 ± 68,86 months. Patients were 3,43 ± 2,53 times hospitalized. Landmine explosion was the most common etiology of amputation with 370 patients (92.7%). Below knee amputation was the most common amputation level with 230 (50,77%) amputations. 399 patients were hospitalized 1369 times and the most common hospitalization reason were stump complications (356 times, 26,00%). Spur formation (202 times) was the most common stump complications. Pyscologic disorders were the most common comorbidity with 68 patient (37,56%).
Conclusion: Patients with traumatic limb amputations are likely to experience several complications and comorbidities. Prevention of secondary conditions affecting those living with the loss of a limb is an important part of amputee rehabilitation and may prevent rehospitalization.

Introduction

Limb loss is a potentially devastating event in a person's life, often resulting in profound physical, psychologic, and vocational consequences. Trauma-related amputations represent an important source of permanent impairment and functional limitation among adolescents and young working-age adults. Despite of a large and growing literature on dysvascular amputations, limited studies have examined the epidemiology of trauma-related amputations [1]. The circumstances surrounding amputation related to injury differentiate from amputation related to dysvascular problems generally. Tissue healing after dysvascular amputation can be severely compromised by patient's underlying disease. Multiple traumatic conditions such as bone fractures, nerve injury etc. may accompany traumatic amputation and interfere with early rehabilitation procedures of the patient. So, findings from the analyses of dysvascular amputation may provide limited data about trauma-related amputations. It is necessary to obtain more data about epidemiology, comorbidities, secondary conditions and reasons for rehospitalization after trauma-related amputation to provide proper rehabilitation with effective prosthetic devices and adaptive equipment [2]. Because, prevention of secondary conditions affecting those living with the loss of a limb is an important part of amputee rehabilitation.

The present study documents the long-term clinical and social functioning outcomes of lower limb amputees who have been

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Table 1
Demographics of patients.

Demographics	n (%)
Male	398 (99,7)
Female	1 (0,3)
Age (years)	23,48 ± 6,04
Etiology	
Landmine	370 (92,7)
Traffic accident	18 (4,5)
Electrical burn	6 (1,5)
Freezing	3 (0,8)
Earthquake	2 (0,5)
Amputation	453 (100)
Single lower extremity	346(86,7)
Bilateral lower extremity	52 (13,0)
Three extremity	1(0,3)
Total duration of hospitalization in our hospital (days)	134,65 ± 144,13
Duration after amputation (months)	119,71 ± 68,86
Duration between amputation and first hospitalization to our hospital (months)	58,99 ± 62,1
Times of hospitalization in our hospital	3,43 ± 2,53
Employee	204 (51,1)
Laborer	176 (44,1)
Self-employment	20 (5)
Military service	8 (2)
Unemployed	195 (48,9)

treated in a tertiary rehabilitation center in Turkey. The aim of this study is three fold: 1) to introduce epidemiologic data of patients with trauma-related amputations as a 10-year experience of a rehabitation center; 2) to determine comorbidities and secondary conditions of lower limb loss; 3) to determine the rehospitalization reasons for lower limb amputee patients.

Materials and methods

This retrospective study was conducted in a tertiary rehabilitation center that includes a special inpatient service for amputee veterans who were wounded due to terrorism or occupational accidents. Patient data between 2001 and 2009 were reviewed. Amputee patients who underwent in-patient rehabilitation program were included in the study. Patients who had amputations for other than traumatic reasons (medical conditions such as dysvascular, cancer, Burger disease, osteomyelitis etc.) were exluded.

Clinical and demographic data of amputees including sex, age, employment status, time since amputation, time after amputation to first hospitalization, length of hospitalization, how many times the patient was hospitalized, reason for hospitalization, stump complications, comorbid conditions, amputation level and K classifacation were documented.

Amputation level was classified for lower extremities as follows; hemipelvectomy, hip disarticulation, transfemoral amputation, knee disarticulation, transtibial amputation, Syme amputation, Chopart amputation, Prigoff amputation, toe amputation, and for upper extremities as follows; shoulder disarticulation, transhumeral amputation, elbow disarticulation, transradial amputation, wrist disarticulation, finger amputation.

All statistical tests were performed using IBM SPSS Statistics software program (Chicago, IL, USA) for Mac version 20.0. Whether the distributions of continuous variables were normal or not was determined by Kolmogorov-Smirnov test. Data are shown as the mean ± standard deviation or median (min-max), where applicable.

Table 2
Levels of totally 400 limb amputations.

Amputation level	n (%)
Transtibial	223 (60.9)
Chopart	50 (13.7)
Transfemoral	49 (13.4)
Syme	17 (4.6)
Knee disarticulation	16 (4.4)
Hip disarticulation	4 (1.1)
Toe	4 (1.1)
Prigoff	2 (0.5)
Hemipelvectomy	1 (0.2)
Total	366

Results

Data of 413 amputee inpatients who have been treated between 01.01.2001 and 31.12.2009 were reviewed. 14 patients who had amputation due to non-traumatic conditions (4 patients with Burger disease, 5 patients with Diabetes mellitus, 1 patient with osteomyelitis, 2 patients with osteosarcoma, 1 patient with squamoz cell cancer) were not included. Remaining 399 trauma-related amputee patients were included in the study.

398 were men and 1 was woman. Mean age of patients was 23,48 ± 6,04 years. 382 (95,7%) were soldiers, 17 (4,3%) were civilian when amputation were performed. Most common etiology of amputation was landmines. Demographics, etiology, amputation level and hospitalization duration are shown in Table 1. Transtibial amputation was the most common amputation level with 230 (50,77%) amputations. Transfemoral and Chopart amputations are the other common levels (14,56% and 11,25% respectively). Frequency of amputation levels are shown in Table 2.

399 patients were 1369 times hospitalized in our hospital and most common hospitalization reason were stump complications (356 times (26,00%)). Application of prosthesis and restoration of prosthesis were the other common reasons for hospitalizations (25,56% and 22,35% respectively). Reason of hospitalizations are shown in Table 3.

Although patients were hospitalized 356 times for stump complication, 801 stump complications were detected in 365 patients. Spur formation and phantom pain were the most common stump complications. Frequency of stump complications are shown on Table 4. Additionally, the 155 patients (38,84%) reported 244 times back pain. Accordingly 42,10% of patients reported phantom pain, 32,33% reported phantom sensation, neuroma and contact dermatitis was detected in 37,84%, spur formation was detected in 50,62% of patients. Spur formation and

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