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Long-term clinical outcomes of war-related bilateral lower extremities amputations

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ABSTRACT

In a cross-sectional study, 291 out of 500 veterans with war-related bilateral lower limb amputations from Iran–Iraq war (1980–1988) accepted to participate in our study. Information related to amputees and amputated limbs were gathered and a Persian version of the Medical Outcomes Study Short Form 36 (SF-36) was filled. To evaluate the effect of amputation level on health related quality of life, we classified patients to seven types according to the functional remainder of major joints (ankles, knees, hips). 97% of patients were male and the average age at the time of injury was 20 years. The major cause of war injury was shells in 50. 54% of amputees were involved in sport activities. The most common amputation level was transtibial (48%).The major stump complaint was muscle spasm. History of being hospitalized for a psychiatric disorder was reported in 5.6%. The average SF-36 score in type 2 to type 6 were 68, 60, 60, 56, and 62, respectively. Except Energy/Fatigue domain, all the other domains were different from normal population. There was not any significant statistical correlation between amputation type and any domain of the SF-36. Type 6 amputees showed an increase in physical health domains compared with former types.

Introduction

Trauma is the third common cause of amputation after vascular disease and diabetes. It usually occurs in young men who are healthy otherwise [1–4]. This category of amputees has a different clinical outcome and complications compared to the other types of amputees [5,6]. Moreover, war related amputations often accompany concurrent deficits such as upper extremities amputations [5,7].

The 8 year Iran–Iraq war (1980–1988) was one of the longest wars in the 20th century that lead to enormous loss. According to a report by Organization of Veterans and Martyrs Affairs of Iran, a total of 20801 amputees remained from the war, of them, 12981 have lower extremities amputations [8].

In the present study, we hypothesized that there is no relationship between the quality of life and the level of amputation among bilateral lower limb amputees. In addition, we tried to scheme a classification of functional needs based on the level of amputation and the number of remaining major functional joints.

Patients and methods

In a cross-sectional study, 500 veterans with war-related bilateral lower limb amputations who were registered in Organization of Veterans and Martyrs Affairs of Iran were invited to participate in our study. Participants had to meet the criteria of having primary or secondary bilateral lower extremity amputation resulting from a single battlefield injury happened during the Iran–Iraq war (1980–1988). Of all, 291 amputees accepted to participate in the study. The Ethical Research Committee of our institute approved the study and all amputees signed the consent form prior to initiation of the study.

The research team consisted of three orthopedic surgeons, a physiotherapist, a prosthetics specialist, and a psychiatric consultant. Amputees were going through each team member to be examined and evaluated in terms of stump complications,

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Table 1
Classification of bilateral lower limbs amputation according to remaining functional major joints (Ankles, knees, hips).

Type	Definitions	Subtypes	Examples
Type 1	Without major joint impairment		Trans metatarsal + Lisferanc
Type 2	Only one major joint is impaired		Syme + Trans metatarsal
Type 3	Two major joints are impaired	*Without ankles* *Without epsilateral ankle and knee*	Syme + Below knee, Trans metatarsal + Above knee
Type 4	Three major joints are impaired	*Without epsilateral ankle, knee and hip* *Without ankle and knee in one limb and ankle in other*	Below knee + Above knee
Type 5	Four major joints are impaired	*Without ankle, knee and hip in one limb and ankle in other* *Without ankle and knee in both limb*	Below knee + Hip, Above knee + Above knee
Type 6	Five major joints are impaired		Hip + Knee
Type 7	All the major joints are impaired		Hip + Hemipelvic

prosthesis problems and psychiatric war-related consequences. Demographic data were collected. Persian version of the Medical Outcomes Study Short Form 36 (SF-36) was used to define amputees' health related quality of life.

The SF-36 questionnaire contains both physical and mental domains that is determined by the summation of 4 items included in each. Higher scores indicate better quality of life. The SF-36 has been tested in terms of validity and reliability in Persian speaking people in Iran and has been utilized for various disease, disabilities and settings [8,9].

In order to show the correlation between quality of life as a subjective finding and the level of amputation as an objective one, we needed a new ordinal classification of amputation level which considers both limbs together. So, we translated the amputation level to the number of remaining major functional joints (ankles, knees, hips) in both lower limbs from 1 to 6. (Table 1) Tibio-fibular discrepancy was described as more than 2 cm discrepancy between their distal ends in each extremity.

Results

Amputees' demographics

Two-hundred ninety-one (58%) out of all 500 bilateral lower extremity amputees participated in our study. The mean time to follow-up was 25.4 years (range from 21 to 28 years). (Table 2) Two-hundred eighty-two (97%) of patients were male and 9 (3%) were female, and all were combatants. The average age of patients at the time of war injury was 20 years (range from 14 to 65 years). The average age of amputees at the time of study was 45 years (range from 37 to 89 years). Average duration of patients' battlefield attempt was 16 months (range from 1 to 81).

In terms of marital status, 77 (27%) amputees out of 285 male were married while at the final follow-up visit, 274 amputees (96%) were married. Of remainder, 12 (4%) were single and one (0.3%) was divorced. The average number of children was 3.2 per amputee (range from 0 to 12). The number of children had a reverse relationship with the level of amputation ($p = 0.013$, $r = -0.64$).

In terms of returning to work, 75 (26%) amputees lost their job after amputation. However, 216 (77%) amputees were satisfied with their current jobs.

In terms of sport activity, 152 amputees (54%) were doing sports for an average of 6.7 h per week (range from 0.15 to 42 h). Except patients in type 6, sport involvement was increased with the level of amputation (Table 2).

Serious accidental falling during tasks or mobilization occurs in 16% of individuals per years (range from 1 to 4 times a year). This problem was less serious amongst type 2 patients than more severe types. The average hospitalization time for amputated limb consequences is 2.5 days per year (ranged from 0 to 17 days) which leads to an average of 51 days out of work (ranges from 3 to 364 days).

In terms of smoking, 127 (44%) amputees had the history of smoking and 91 (31%) amputees were smoking at the time of study. Twenty-eight amputees (9.6%) had the history of addiction to opium. Addiction was more prominent in type 6 (Table 2). History of smoking does not show specific pattern. Except type 5, History of drug addiction increased by rising types of amputation (Table 2).

Amputation demographics

According to medical records of patients, the cause of war injury included shells in 143 patients (50%), landmines in 97 patients (34%) and bombs in 25 patients (9%). Other agents (Vehicle accident, bullet, freezing and blast wave) were account for less than 7 percent of amputations. Although shells were the leading cause for all types of amputations (50% to 60%) ($p = 0.86$, $r = 0.010$), land mine related injury was a more important agent in minor amputations ($p = 0.04$, $r = -0.67$) (Table 2).

Classification of bilateral amputation level is demonstrated in Table 3. The most common type was type 3 followed by type 4. There was neither type 1 nor type 7 amputees in our study. Amongst 183 patients (366 limbs), 230 (63%) limb amputation happened at the battle field, 3 (1%) in an emergency camp, 18 (5%) in a desert hospital and 113 (31%) in a city hospital.

Fifteen out of 277 (5.4%) amputees had an additional upper limb amputation. The rate of upper limb amputation increased with lower limb amputation level (Table 2). Stump shape was conical in 137, cylindrical in 367 and fungi form in 33 amputees. The major complaint was spasm of the stump. (Table 4) In terms of prosthetic fitness 7.9% of amputees were not able to wear the prosthesis due to stump complication. Clinical symptoms included phantom sensation in 220 out of 283 (78%) on the right and in 217 (74%) on the left, phantom pain in 191 out of 277 (66%) on the right and in 192 (66%) on the left. Except type 2, prosthesis usage was decreasing with increasing the level of amputation (Table 4).

Psychiatric problems

Twelve amputees out of 216 (5.6%) had a history of being hospitalized for psychiatric disorders and 59 (27%) were under outpatient psychiatric care. Depression, bipolar disorder and PTSD were detected in 19, 18 and 7 amputees, respectively. As the type of amputation level goes up, the number of depressed patient increases ($p = 0.021$, $\rho = 0.81$); but, the number of PTSD disorder decreases ($p = 0.04$, $\rho = -0.68$) (Fig. 1).

Eighty amputees (27.5%) suffered from Axis I disorders. Substance dependence, cognitive, psychotic, mood, anxiety and somatoform disorders were found in 13, 1, 5, 32, 17, and 1 patients, respectively.