

Gas gangrene, diabetes and amputations of upper extremities

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Summary. *Purposes:* The aim of the current study was to evaluate epidemiological data on amputations of upper extremities. *Methods:* The main causes of upper extremity amputations performed in the period from January 1998 to January 2008 in Hospital de Base, São José do Rio Preto were retrospectively evaluated in a descriptive and quantitative cross-sectional study. Data, including the age of the patient, gender and the reason for surgery, were obtained from hospital records identified by the international classification of diseases (ICD) code for amputation. *Results:* A total of 2919 amputations were performed in the period of this study with only 23 involving the upper extremities; thus 22 patients were included in this study as one was submitted to amputation of both arms. Fifteen patients (65.21%) were male with ages that ranged between 18 and 84 years old (mean = 41.6 years old). Seven patients (34.79%) were women with ages from 24 to 87 years old (mean = 58.8 years old). The causes for amputation were: accidents (14), gas gangrene (4), malignant neoplasms (3), arterial thrombosis (1) and unidentified cause (1). *Conclusion:* Gas gangrene of the upper extremities is associated to diabetes mellitus which highlights the severity of the disease. (www.actabiomedica.it)

Key words: gas gangrene, diabetes, amputations, upper extremities

Introduction

Upper extremity amputations are not as common as lower extremity amputations, but they present unique challenges to the surgeon, prosthetist and amputee (1). The predictors of amputation for patients with lower extremity vascular trauma are well described in the literature, but the predictors of amputation of upper extremities are not so well defined. One study suggests that for the vast majority of upper extremity injuries, salvage should have been attempted regardless of the severity score (2).

The main causes of amputation of upper extremities are accidents, neoplasms, ischemia and infection (1-5).

Although upper extremity ischemia is rare, results for upper extremity bypass are excellent, superior to those reported for lower extremity ischemia (3). Gas gangrene of the upper limb is rare, acutely painful and rapidly

fatal (4). The primary goal of treatment for malignant bone and soft tissue tumors of the hand and upper extremity is an oncological cure. Despite recent advances in chemotherapy and radiation techniques, amputation still provides a means to achieve surgical cure for some bone and soft tissue sarcomas (5). Patients submitted to major amputations of the upper extremity show high psychological and functional impairment. Pain, deficits in function and still non-optimal prosthetic devices result in a high percentage of unemployment (6).

The aim of the current study was to evaluate epidemiological data of amputations of the upper extremities in a teaching hospital.

Methods

The main causes of amputations of upper extremities performed in the period from January 1998

to January 2008 in Hospital de Base, São José do Rio Preto were retrospectively evaluated in a descriptive and quantitative cross-sectional study.

Data, including the age of the patient, gender and the reason for surgery were obtained from hospital records identified by the international classification of diseases (ICD) code for amputation. The data were input on an Excel spreadsheet with the frequency of the events being used for statistical analysis.

This work was approved by the Research Ethics Committee of the Medicine School in São José do Rio Preto (FAMERP)-Brazil.

Results

Of a total of 2919 amputations performed in the study period, only 23 procedures involved the upper extremities. In total only 22 patients were included in this study as one individual was submitted to amputation of both upper extremities. Fifteen patients (65.21%) were male with ages that ranged between 18 and 84 years old (mean = 41.6 years). Seven patients (34.79%) were women with ages from 24 to 87 years old (mean = 58.8 years).

The causes of amputation were: accidents (14), gas gangrene (4), malignant neoplasms (3), arterial thrombosis (1) and unidentified cause (1). Of the 14 trauma patients, the indication of amputation was due to vascular lesions. Of the 4 patients submitted to amputations for gas gangrene, 3 were diabetics.

Discussion

This study found that trauma, gas gangrene and neoplasms were the three main causes of amputations of the upper extremities and warns about the association between diabetes and amputations due to gas gangrene. In the literature there are only a few case reports that mention gas gangrene of the upper extremities (6-8). In respect to the lower extremities, there is a correlation between infection by gas gangrene and diabetes (9). Another aspect that should be considered is the death rate of individuals with gas gangrene of the lower extremities at around 30% of the cases (9). For the upper extremities, there was one death in four cases with gas gangrene. Thus, this serves as a warning

about the seriousness of gas gangrene associated with diabetes and the possibility of death.

Amputations of lower extremities are more common than of upper extremities. In respect to age, female patients submitted to amputations of the arms were older than male patients. This difference may be explained by the fact that men suffer more accidents than women in this region (10).

Injuries of arms have consequences that limit all the aspects of human activities. In rehabilitation, the movements of upper extremities are more specific and precise than movements of the lower extremities and thus greater functional limitations are experienced. Self-reported upper extremity health status and quality of life following amputation of the hand can be in contrast to the objective pathology. In patient-oriented assessment of results, individual psychosocial factors that may affect results must be taken into consideration (11).

An upper extremity disability should be evaluated after the completion of treatment and full adaptation when further functional changes are not expected. The dominance of the right or left hand before the disability should not be considered when there is a high rate of disability (12).

Another important aspect in respect to trauma is the treatment provided. Delay in surgery, blunt trauma and extensive soft tissue defects in combined orthopedic and vascular injuries were associated with increased risk of amputation, while associated nerve injuries and bone injuries with extensive soft tissue damage are risk factors of a poor quality outcome (13).

Conclusion

Gas gangrene of the upper extremities is associated with diabetes mellitus and serves as a warning in respect to the severity of the patient's disease.

Authors' Contributions: All authors participated and contributed to all phases of the study

Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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