

OPERATIONAL MORBIDITY ANALYSIS OF SOFT TISSUE INJURIES DURING OPERATION TELIC

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Abstract

Soft tissue injury accounted for one in five of all presentations to the Emergency Department (ED) during Operation TELIC (UK forces in Iraq) from March 2003 to November 2006. This ranks soft tissue complaints as the most frequent cause of attendance to a deployed field hospital ED. This paper analyses the injury patterns, together with implications for future clinical practice and operational planning to prevent injury, optimise patient care and maximize force regeneration.

Introduction

The Operational Emergency Department attendance register, OpEDAR, records attendances at the Emergency Department (ED) of each deployed Field Hospital. Starting in 2003 as a hand-written register, OpEDAR has developed into an electronic database and is validated against other sources of casualty data by the Defence Analytical Services Agency (DASA) [1].

By December 2007 over 35,000 attendances were recorded at UK field hospital EDs in Iraq and Afghanistan. Russell et al have provided an overview of the process and a headline analysis. [1]

During the period 01 March 2003 to 30 June 2007 30,195 casualties were seen in serial UK field hospitals on Operation TELIC. This 52 month period covers the concentration phase in Kuwait prior to war fighting, and all subsequent attendances to the UK field hospital in Southern Iraq at Shaibah Logistic Base.

Methods

The validated electronic format of OpEDAR data between 01 March 2003 and 30 June 2007 was analysed using Microsoft Excel® software. Soft tissue conditions have been categorized on OpEDAR under three principal headings (Table 1).

Fractures, dislocations, contusions, haematomata, lacerations and stab wounds are not included in this analysis. Facial or head injuries and casualties with multiple injuries were excluded and are classified elsewhere on OpEDAR. Paediatric patients and review attendances were also excluded from the total figures analysed.

Results

Over the 52 month period there were 3870 patients with orthopaedic soft tissue injuries, 2080 with musculoskeletal complaints and 139 with rheumatological conditions.

Category	Condition
Musculoskeletal	Back pain
	Knee pain
	Leg pain / stiffness
	Neck stiffness
Orthopaedic soft tissue injury	Ankle injury
	Achilles tendon injury
	Gunshot wound – arm or leg
	Ligament injury
	Sprain / strain
	Wrist injury
	Foot injury
	Hand injury
	Tendon injury
Rheumatology	Bursitis
	Tendonitis
	Tenosynovitis

Table 1: Classification of soft tissue conditions

Collectively, soft tissue conditions comprised 20.2% (6089 patients) of all attendances and represent the most common cause of morbidity on operations, ahead of gastrointestinal illness (18.5%).

Figures 1a and 1b show the attendances with soft tissue conditions by Op TELIC phase. The absolute numbers of cases have fluctuated during each operational phase reflecting the total number of troops in theatre and the evolving nature of military operations. Figure 2 demonstrates the rate of attendances per 1000 British troops deployed in TELIC 1 through TELIC 8 (19 March 2003 to 14 November 2006).

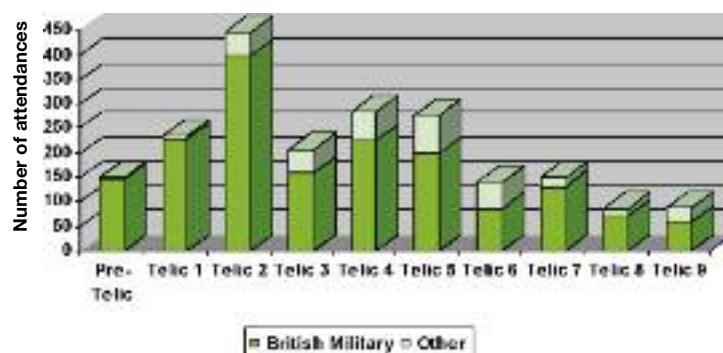


Figure 1a: Musculoskeletal attendances by Op TELIC phase

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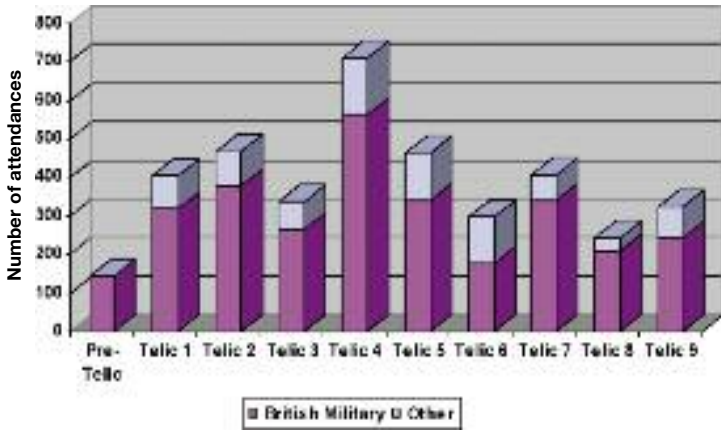


Figure 1b: Orthopaedic soft tissue attendances by Op TELIC phase

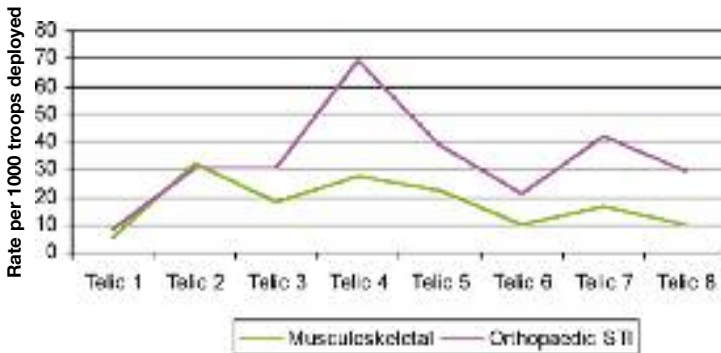


Figure 2: Rate of soft tissue attendances for British military personnel (DASA supplied)

Historically, casualties have been categorized as “Battle Injury” (BI) and “Disease Non-Battle Injury” (DNBI). BI accounts for 5.2% of the soft tissue conditions: these casualties also represent Wounded in Action (WIA). DNBI can be usefully separated into those with wounds/injuries sustained outside combat (Wounded Non-Enemy Action, WNEA, 79.1%) and those with non-traumatic disease (15.7%). This is demonstrated in Figure 3.

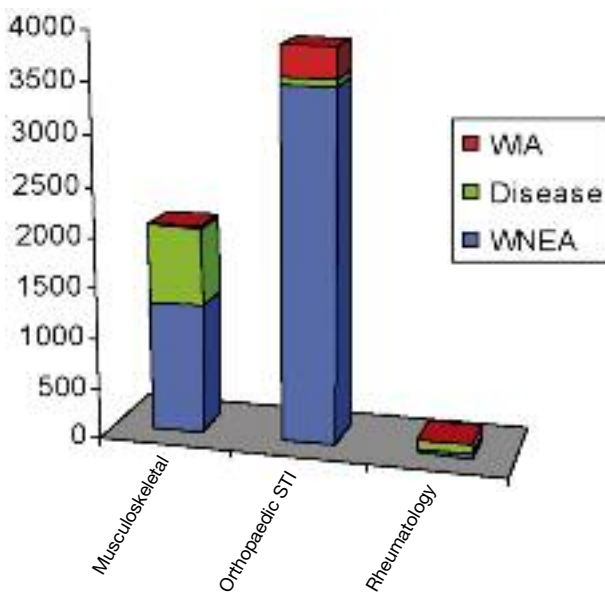


Figure 3: Cause of Injury

For the majority of WNEA, OpEDAR does not specify the injury mechanism. Motor vehicle accident is specified for 150 cases and sports injury for 71 cases.

Figure 4 shows the proportion of attendances for soft tissue conditions by status. 79.8% were British military; 7.1% were coalition forces (e.g. US military); 6.0% were local civilians; 3.7% were coalition civilians (e.g. locally employed civilians; Iraqi police); 2.1% were UK civilians (e.g. contractors); 1.2% were hostile forces (enemy prisoners of war; post-war detainees); and 0.1% were undocumented.

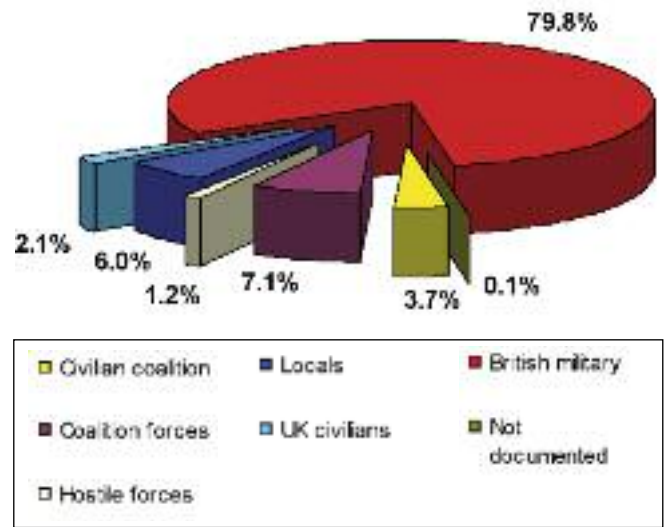


Figure 4: Soft tissue conditions by status

Of the 6089 total patients with soft tissue conditions, 1869 (30.7%) were admitted for hospital management, including inpatient physiotherapy. 17/1869 were admitted to intensive care or high dependency care. The majority (n=3631, 59.6%) were returned to unit from the emergency department with a further 172 (2.8%) referred to physiotherapy as an outpatient or primary care. Disposal from the ED is not documented in 417 cases (6.8%). Figure 5 demonstrates the disposal.

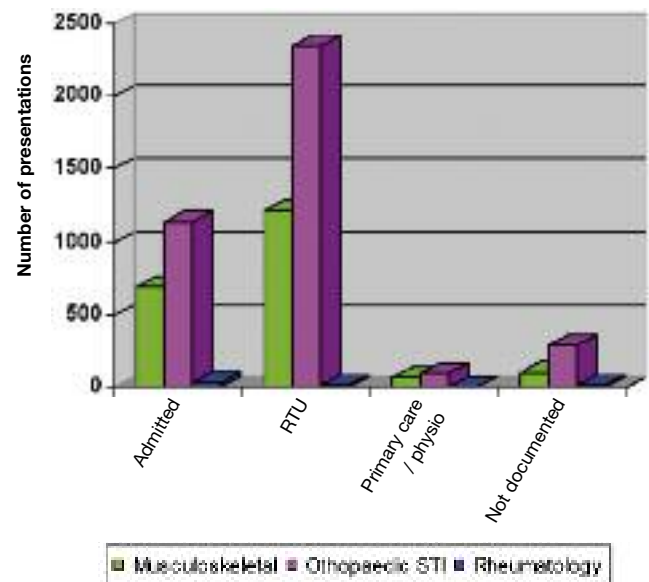


Figure 5: Disposal of soft tissue conditions from the ED

The anatomical distribution of the soft tissue conditions is shown in Figure 6. The specificity of recorded diagnoses is incomplete as although knee, back and neck conditions can be discriminated, the absolute prevalence of ligamentous ankle soft tissue injuries has to be assumed from “orthopaedic soft tissue injury, lower limb, excluding knee” (n=1721, 28% of all attendances for soft tissue conditions). Gout has been recorded separately (n=11) without an anatomical descriptor.

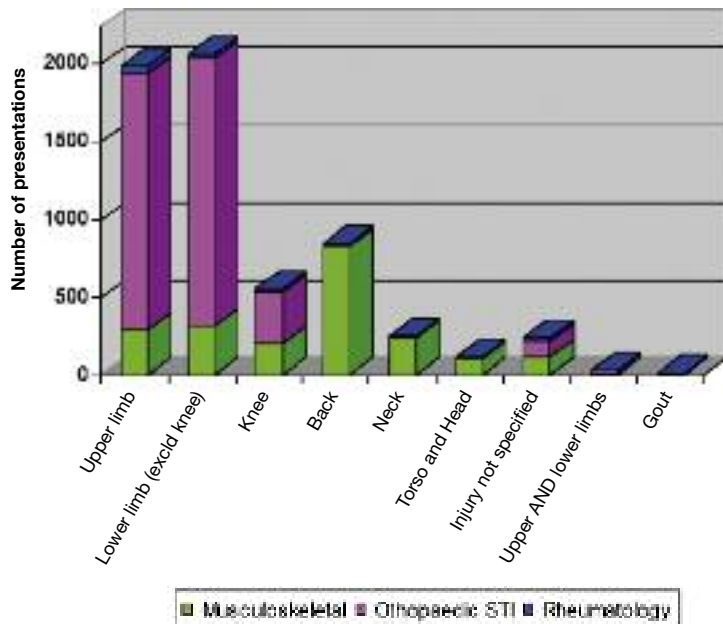


Figure 6: Anatomical distribution of injuries (gout was recorded independently, without an anatomical descriptor)

Discussion

Soft tissue injuries and musculoskeletal conditions are highly prevalent in deployed military personnel. Only a small proportion of these attendances were the direct result of combat (5.2%). OpEDAR has not consistently recorded the injury mechanism for WNEA: personal experience of the authors who are emergency physicians is that there is a much higher incidence of sport related injuries than recorded, which is to be expected in a population whose occupation places a strong emphasis on physical fitness and exercise. Improvement in recording this domain is required if local commanders are to take objective decisions on force protection with regard to sports activities.

This paper is an incomplete representation of the soft tissue injury workload of a deployed emergency department. Patients who have suffered multiple injuries that have a soft tissue component will be excluded, as are children and patients returning for review appointments.

In the civilian NHS environment the threshold for admission of an ankle sprain, soft tissue knee injury or acute mechanical back injury will be very high. Usually patients can be discharged home with analgesia, crutches where appropriate and written advice regarding mobilisation exercises. There will often be a delay in accessing physiotherapy due to the NHS case volume and referral is not the routine for fit, young patients.

In the deployed environment the threshold for admission is much lower as a high degree of physical independence is mandatory if patients are to be returned to their field units. Those who cannot be rehabilitated quickly will be removed from theatre. As this can have a profound effect on force effectiveness, the early and routine referral of patients to physiotherapy is the norm. Deployed physiotherapy services (as part of the Deployable Rehabilitation Team) are immediately accessible from the emergency department.

The overall trend of musculoskeletal complaints has been a reducing frequency over the period studied. There is a high peak of orthopaedic soft tissue injuries during OP TELIC 4 and a subsidiary peak during OP TELIC 7. In retrospect it is not possible to accurately identify the cause. If OpEDAR is to reach its full potential then weekly near real-time analysis would identify a rising trend that can be directly related to the nature and tempo of operational activities: this would provide commanders with a powerful force protection indicator. To achieve this requires reliable electronic returns with the same priority assigned to OpEDAR as existing mandatory information requirements to the command chain.

OpEDAR is an important source of epidemiological information, but it has limitations. It was established by clinicians and has been maintained through the good will of emergency physicians and nurses. Its organisational importance has risen as the reliable source of Wounded in Action statistics, which are verified through DASA, and its potential to inform future operational planning with realistic casualty estimates and pathology is emerging.

Conclusions

Soft tissue injuries are a consistent cause of morbidity in an otherwise healthy population. They account for multiple days lost from full active duty with direct implications for force effectiveness.

The granularity of OpEDAR requires to be increased to give greater detail regarding the cause of soft tissue injuries (for example sports injury) to allow preventative steps to be taken where possible.

References

1. Russell R, Hodgetts T, Ollerton J, Massetti P, Skeet J, Bray I, Harrison K. The Operational Emergency Department Attendance Register: A New Epidemiological Tool. *J R Army Med Corps* 2007; **153**(4): 244-250.