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A Profile of Ankle Injuries in Australian Army Soldiers

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Background

Injuries in the military are associated with interruptions in service, detract from capability and present a high financial and resource burden. Prior to injury prevention strategies being implemented, research is needed to further understand the circumstances of these injuries. Ankle injuries are among the most common injuries reported in military training (1, 2, 3). The ankle in particular is a problematic area as many perceive it to not be a serious injury, despite the potential to lead to long term disability (4). The risk of recurrence is also considered to be high, with estimates of double the risk of a recurrent ankle sprain within the 12 months after an initial injury with further risk of ongoing pain and instability (5). In military personnel, risk ratios of recurrence of 2.8 [2.02-3.87] in males and 2.83 [1.89-4.23] in females have been reported. The aim of this investigation was to profile ankle injuries suffered by both full time and part time Army personnel over a two-year period.



Methods

Data from a two-year period 2012-2014 was obtained from the Department of Defence, detailing the locations, activities, natures and mechanisms of ankle injuries. Minor Personal Injuries (MPI) were injuries which did not require immediate hospitalization, whereas Serious Personal Injuries (SPI) did. Descriptive analyses were performed to determine the lead contributors of these types to ankle injuries, and ankle injury rates were calculated for each service type relative to days of exposure.

Results

A total of 1315 ankle injuries were reported, giving an incident rate of 2.1 recorded ankle injuries per 100 soldier years of service. Of these injuries, 1291 were deemed Minor Personal Injuries (MPI) and 24 as Serious Personal Injuries (SPI). MPIs were most commonly trauma to the ankle joint and ligaments (n=693), soft tissue (n=491) or due to fractures (n=54), with the ankle injuries most commonly occurring in Physical Training (n=457), Combat Training (n=267) or while walking (n=109). Ankle injuries were commonly due to Falls (n=832), gradual onset muscular stress (n=284) and muscular stress from handling objects (n=45). SPIs affecting the ankle were primarily fractures (n=10), soft tissue injuries (n=6) or dislocations (n=4), and occurred during Physical Training (n=4), while playing touch football (n=3) or while walking (n=3), due primarily to falls (n=12), contact with objects (n=4), or cumulative muscular stress (n=3).

MINOR INJURY

| Nature of Injury | Number | ARA | ARES |
|------------------------------|-------------|-------------|------------|
| Trauma to joint and ligament | 693 | 611 | 82 |
| Soft Tissue injury | 491 | 441 | 50 |
| Fracture | 54 | 52 | 2 |
| Dislocation | 28 | 28 | 0 |
| Contusion/Bruising/Crushing | 14 | 11 | 3 |
| *Collated Others | 11 | 9 | 2 |
| TOTAL | 1291 | 1152 | 139 |

| Activity | Number | ARA | ARES |
|-------------------|-------------|-------------|------------|
| Physical Training | 457 | 423 | 34 |
| Combat Training | 267 | 212 | 55 |
| Walking | 109 | 95 | 14 |
| Marching | 85 | 66 | 19 |
| Football/Soccer | 75 | 74 | 1 |
| *Collated Others | 298 | 282 | 16 |
| TOTAL | 1291 | 1152 | 139 |

| Mechanism | Number | ARA | ARES |
|---|-------------|-------------|------------|
| Falls | 832 | 729 | 103 |
| Muscular Stress | 284 | 264 | 20 |
| Muscular Stress while handling/lifting/carrying | 45 | 40 | 5 |
| Being hit by moving objects | 66 | 64 | 2 |
| Stepping/kneeling/sitting on objects | 18 | 15 | 3 |
| *Collated Others | 46 | 40 | 6 |
| TOTAL | 1291 | 1152 | 139 |

SERIOUS INJURY

| Nature of Injury | Number | ARA | ARES |
|-------------------------------|-----------|-----------|----------|
| Fractures | 10 | 9 | 1 |
| Soft tissue injuries | 6 | 5 | 1 |
| Dislocation | 4 | 4 | 0 |
| Trauma to joint and ligaments | 4 | 0 | 0 |
| TOTAL | 24 | 22 | 2 |

| Activity | Number | ARA | ARES |
|---------------------------|-----------|-----------|----------|
| Physical Training (PT) | 4 | 4 | 0 |
| Football Touch | 3 | 3 | 0 |
| Walking | 3 | 3 | 0 |
| Combat Training | 2 | 2 | 0 |
| Manual/Materials Handling | 2 | 0 | 2 |
| *Collated Others | 10 | 10 | 0 |
| TOTAL | 24 | 22 | 2 |

| Mechanism | Number | ARA | ARES |
|---|-----------|-----------|----------|
| Falls | 12 | 12 | 0 |
| Muscular stress | 3 | 3 | 0 |
| Muscular stress while handling /lifting/ carrying | 2 | 1 | 1 |
| Hitting moving or stationary objects | 4 | 4 | 0 |
| Other | 1 | 0 | 1 |
| Vehicle accident | 2 | 2 | 0 |
| TOTAL | 24 | 22 | 2 |



Conclusions

Targeted approaches to minimizing these ankle injuries should focus on reducing risks of slips, trips and falls during both Physical Training and Combat Training. Previous ankle injuries need to be rehabilitated completely so they do not contribute to re-injury.

Operational Relevance

Injuries to the ankle are common in tactical environments and recurrence rates are the highest of all lower limb musculoskeletal injuries. Attempts should be made to identify causes and minimize first time occurrences where possible.

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