Injury Epidemiology of Unintentional Musculoskeletal Injuries in the United States Air Force Special Tactics Forces

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ABSTRACT

A first step in the injury prevention process is determining the magnitude and scope of unintentional musculoskeletal injuries (MSIs) in the target population. The United States Air Force Special Tactics (ST) Operators maintain a high level of tactical readiness for their unique mission set. This study aimed to determine the magnitude, frequency, anatomical location, and activity of all injuries and preventable injuries (PIS) among United States Air Force ST Operators. All data were collected utilizing the UPITT Medical Epidemiology Database. The incidence of total injuries (TIs) was 24.2 MSIs while PIs was 12.6 injured Operators/100 Operators/year. The upper extremity was the most commonly injured anatomic location followed by the spine and lower extremity. Pain/Spasm/Ache was the most common injury type for both all injuries and PIS. Preventable injuries comprised of 46.9% of total injuries. Results should guide human performance teams across their squadrons in order to counter the risk of injury and to optimize performance. The results of the study should guide the human performance team’s effort to mitigate MSIs and extend the career longevity and quality of life of the ST Operator.

METHODS

SUBJECTS

All ST Operators enrolled (Age: 27.8 ± 5.4 years, Height: 177.3 ± 6.1 cm, Mass: 82.6 ± 8.6 kg) in the study. Self-reported injury history was collected by a certified athletic trainer for a one-year period. A MSI was defined as an injury to the musculoskeletal system that resulted in alteration of tactical activities, tactical training, or physical training for a minimum of one day, regardless of medical attention was sought. Injury data was categorized based on injury type, activity, mechanism of injury across all and preventable injuries (Pis). Pis were defined as an unintentional injury that may be reduced through injury prevention programs. Incidence, frequency, anatomical location, and activity were described for all injuries and injuries classified as preventable. RESULTS: The frequency of total injuries (TIs) was 33.7 MSIs while Pis was 18.8 MSIs/100 Operator/year. The results of the current study should guide the human performance team’s effort to mitigate MSIs and extend the career longevity and quality of life of the ST Operator.

RESULTS

SUMMARY AND CONCLUSIONS

• Preventable injuries comprised of 46.9% of total injuries
• The anatomical location of injury is presented in Figure 1 and Figure 2
• The upper extremity was the most common reported location followed by the spine and lower extremity for all injuries and preventable injuries
• All injuries: 31% upper extremity, 28% Spine, and 28% lower extremity
• Preventable injuries: 40% each for upper extremity and spine
• Pain/Spasm/Ache was the most common injury type for both all injuries and preventable injuries
• Type of injury for all injuries and preventable injuries is presented in Table 4
• Physical training was the most reported activity at the time of injury for all injuries and preventable injuries

TABLE 1: Demographics - Mean ± Standard Deviation

<table>
<thead>
<tr>
<th></th>
<th>Age (yr)</th>
<th>Height (cm)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST Operators</td>
<td>27.8 ± 5.4</td>
<td>177.3 ± 6.1</td>
<td>82.6 ± 8.6</td>
</tr>
</tbody>
</table>

TABLE 2: Musculoskeletal Injuries/100 Subject-Year

<table>
<thead>
<tr>
<th></th>
<th>All Injuries</th>
<th>Preventable Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Incidence</td>
<td>24.2</td>
<td>12.6</td>
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<tr>
<td>Physical Training</td>
<td>33.7</td>
<td>21.9</td>
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<tr>
<td>Recreational Activity/Sports</td>
<td>32.3</td>
<td>77.8</td>
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<tr>
<td>Injury Prevention</td>
<td>27.8</td>
<td>5.9</td>
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<tr>
<td>Recreational Injury</td>
<td>26.7</td>
<td>1.5</td>
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<tr>
<td>Lower Extremity</td>
<td>21.8</td>
<td>3.1</td>
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TABLE 3: Reported Activity at Time of Injury (%)

<table>
<thead>
<tr>
<th></th>
<th>All Injuries</th>
<th>Preventable Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Training</td>
<td>50.0</td>
<td>50.0</td>
</tr>
<tr>
<td>Recreational Activity/Sports</td>
<td>49.0</td>
<td>49.0</td>
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<tr>
<td>Injury Prevention</td>
<td>31.3</td>
<td>31.3</td>
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<tr>
<td>Recreational Injury</td>
<td>15.8</td>
<td>15.8</td>
</tr>
<tr>
<td>Lower Extremity</td>
<td>15.8</td>
<td>15.8</td>
</tr>
</tbody>
</table>

FIGURE 1: Anatomical Location of All Injuries

FIGURE 2: Anatomical Location of Preventable Injuries

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