

The role of sports and exercise medicine in the military

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ABSTRACT

Background

Military training is notorious for being physically intensive interspersed by limited recovery periods, culminating in a high frequency of training-related injuries. Confusion may arise when military personnel are compared to athletes in other sporting disciplines in view of different training regimes employed by the military according to the set standard of the respective army. Hence, in line with other sporting disciplines having a designated medical team of sports and exercise professionals that is experienced in that particular field, this article discusses the importance of having such a team in the military.

Objective

The benefits of having a designated sports and exercise medicine set-up are discussed vis-à-vis the military.

Methods

A literature review of injuries related to military training comparing different armies is presented. Audit work attained from a military sports and exercise clinic is presented, listing injury type (acute or overuse) as well as the anatomical areas involved to highlight the specifics of injury outcomes in this population.

Results

A total of 72% of injuries listed were overuse in nature with a high propensity of injuries recorded in the lower limbs, in keeping with the methods of training employed by armies worldwide.

Conclusion

The availability of a designated sports and exercise clinic in a military setting can serve various purposes, not only through the provision of a service that is specific to military personnel and which therefore complements the ongoing training structures, but also

through the provision of guidance in the planning of training regimes as well as in pre-training medical screening.

Key words

Military, sports and exercise, injury, screening, training.

INTRODUCTION

Over the past years, sports and exercise medicine has gained recognition as a separate medical speciality which has grown and evolved in parallel with the demands of professional and recreational athletes. Military personnel are likewise faced with increasing physical demands on a regular basis to enable them to carry out their duties effectively. Although certain military operations may be pre-planned and therefore operation-specific training can be undertaken prior to start of a specific operation, the respective army may be faced with emergencies necessitating the deployment of military personnel for local or offshore operations with little preparatory training. Hence there is a need of continual training to ensure high levels of physical and mental preparedness amongst all personnel. The undertaking of such training may be facilitated by access to a designated team of professionals specialised in sports and exercise medicine who can manage injured soldiers from diagnosis till return to full and unrestricted duties.

Military recruits consist of a separate group of army personnel representing the transition of civilians with different levels of physical endurance into military personnel. Basic military training (BMT) is essentially a transition undertaken by recruits involving high loads of physical, theoretical, military conduct and drill training over a predefined time period with limited rest interludes. The end result is that a high number of injuries are observed that are compounded further by the limited time available to military medical personnel to fully treat and rehabilitate injured recruits. Whilst injuries in active servicemen result in time off from military duties, delays

in recognising injuries and commencing treatment in military recruits may lead to premature discharge and therefore loss of eventual manpower. The assistance provided by a designated multidisciplinary sports clinic with access to a number of therapeutic and diagnostic modalities would therefore span both regular active servicemen and military recruits. This study presents a review of a designated sports clinic in the Maltese armed forces that assessed both recruits and active servicemen over a 14-week period, including details of the anatomical regions mostly afflicted in military personnel.

BACKGROUND

From a body-conditioning perspective and in line with other endurance sporting disciplines, military training results in improvements in aerobic fitness as well as fat free mass (Williams, 2005). Malavolti et al. (2008) noted that although military training resulted in body fat reductions and improvement in cardiovascular performance (as measured by VO_2 scores, where VO_2 represents the volume of oxygen per body weight utilised per minute), improvement in strength scores amongst recruits only followed an augmentation of the training programme by additional strength training (Santtila, et al., 2008). Intense military training remains generally associated with an increase in fat free mass and decrease in fat mass (Malavolti, et al., 2008); however the same has not been described in post-deployment studies. In fact, body composition studies of military personnel deployed to Iraq (Lester, et al., 2010) and Afghanistan (Sharp, et al., 2008) identified increments in body fat percentages. Furthermore, this was associated with declines in aerobic capacity, further suggesting that pre-deployment training is not continued during the actual deployment, resulting in loss of aerobic gains.

In audit work of injuries in military personnel, in a population cohort of 10,692 personnel of varying military backgrounds, up to 52% had sustained at least one exercise and sports related injury (Hauret, et al., 2015). When one takes into consideration that running forms the bulk of endurance training in the military, it is no surprise that running constituted up to 45% of overuse exercise related injuries with acute sprains and strains representing another 40% of the reported injuries. In a prospective study of BMT in military police recruits, 34.2% of men and 66.7% of women sustained at least one training related injury (Knapik, et al., 2013). Jones and Knapik (1999) identified a similar gender difference in earlier audit work investigating BMT in the United

States Army, where a cumulative incidence of injury of 25% for men and 50% for women was demonstrated. The authors also described a number of potentially modifiable risk factors that may alter injury risk in this specific population, further enhancing the requirement that military personnel should be managed and assessed in a different manner than sport-specific athletes, to better reflect their differing physical demands (Jones and Knapik, 1999).

With reference to the Maltese military, limited data is available. From unpublished audit work carried out in 2012, up to 40% of actively serving military personnel who had been excused from the regular line of duty for 30 days or more claimed musculoskeletal ailments as a cause of their exemption. This work served as the foundation for a prospective study investigating risk factors for lower leg, ankle and foot injuries in Maltese recruits undertaking BMT (Psaila and Ranson, 2016). A number of risk factors were investigated with only decreased pre-recruitment fitness scores being significantly associated with an increased injury risk. This is concordant with the findings of a number of studies (Knapik, et al., 2001; Knapik, et al., 2006).

Shortly after the start of 2016, a joint sports clinic was set up in the Maltese army medical centre between a military medical officer and a sports and exercise medicine consultant. Clinics were organised on a weekly basis and were of three hours' duration during which all serving personnel could attend for assessment of their sports injuries. Likewise, military medical officers could refer soldiers directly to this clinic for further assessment and investigation. Allied health professionals did not form part of this clinic directly although a number of referrals from this clinic were made to physiotherapists for treatment and podiatrists for treatment and detailed biomechanical assessments.

MILITARY SPORTS CLINIC

From a review of the first three months of the above-mentioned sports clinic, a total of 115 actively-serving men and women as well as recruits attended the sports clinic, with 32 ailments being acute and 83 representing chronic or overuse injuries. Only new cases were recorded and follow-up visits for the same ailment were not included in this total. Over 14 weeks, attendance to this clinic averaged 8.2 patients per clinic session. This allowed bridging the gap between the Maltese army medical centre and the Maltese general hospital, expediting in the process access to investigative and

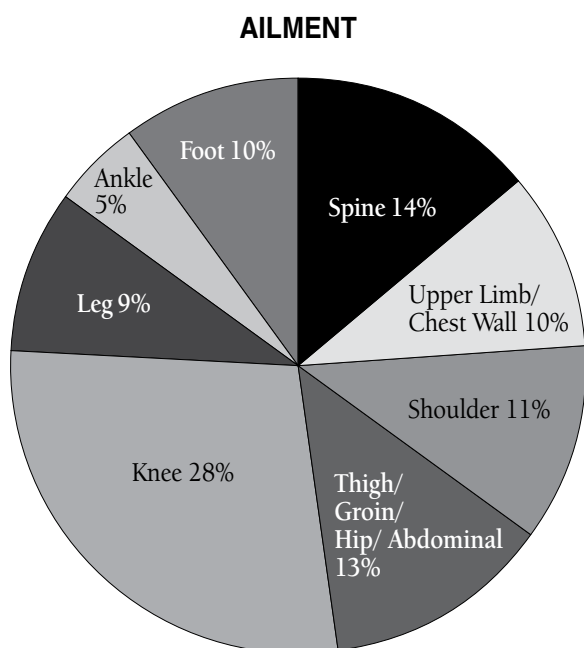


Figure 1. Ailment distribution according to anatomical region.

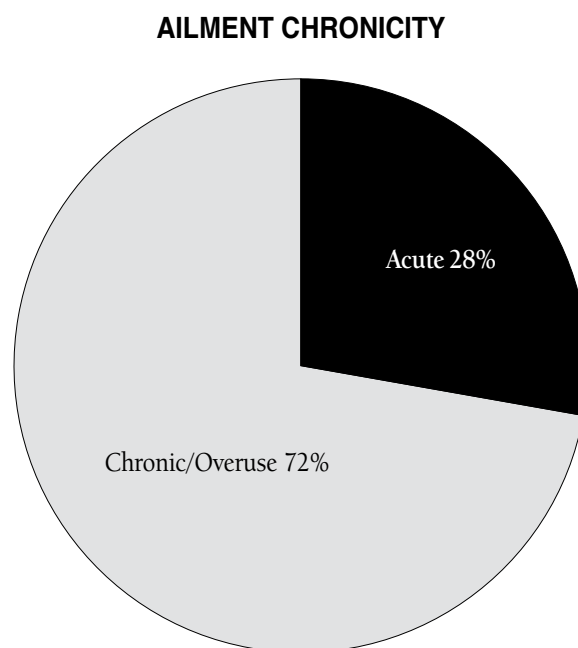


Figure 2. Ailment type represented according to chronicity.

therapeutic modalities. The pie chart depicted in Figure 1 highlights the distribution of ailments according to anatomical region. Figure 2 depicts the ailment according to chronicity. Of note is the relative majority of lower limb regions, again a reflection of the endurance training employed by the military which many times involves lower limb loading through running and marching. Nonetheless, upper body conditioning forms an important part of soldier training reflecting itself in shoulder and upper limb injuries which represented 21% of all ailments seen at the sports clinic.

With regards to injury type, as identified in similar studies on foreign military recruits (Kaufman, Brodine and Shaffer, 2000; Schwartz, et al., 2014), the most prevalent injury type were overuse injuries, with medial tibial stress syndrome being the commonest overuse injury identified. This is similar to the conclusion of Psaila in his unpublished review of risk factors for lower limb injuries. This highlights the importance of further studies investigating overuse injuries in the military population as well as the need to train military physical instructors towards using training patterns that help reduce the risks of such injuries. Such modifications might include gradual running distance increments and night rest to reduce injury risk (Wyss, et al., 2014). Studies on the local military population would further help to expand the limited data available.

CONCLUSION

From this review article, the role of a designated military based sports clinic can be appreciated. The term military is used to reflect the specialised role of such a team which is experienced both in the screening of military personnel as well as identifying and treating injuries that are commoner in this specific population. Such a sports and exercise multidisciplinary team can assist military physical instructors in planning their military training, routine physical training as well as specialised pre-deployment training, in an attempt to help reduce injury risk. This should augment the number of servicemen available for duty to respond to their day-to-day tasks as well as emergencies and deployments as required by their respective army. With regards to the professionals forming part of the sports clinic, in view of the number of referrals to allied health professionals for treatment and further assessment, it would be advisable that this study is repeated in the future with the inclusion of both a physiotherapist and a podiatrist.

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