General

Research Presentations: Institute of Naval Medicine SpR Study Day 2011

A M Wood, Surg Lt Cdr RN, Institute of Naval Medicine

This year's Institute of Naval Medicine study day included the inaugural registrars research forum. This enabled the registrars to share their research with the rest of the Royal Naval registrars. After peer review, six abstracts were accepted for oral presentation and are detailed below.

The presentations enabled a lively discussion and were of high quality. A couple of the papers were of particularly high scientific value and this is reflected in the acceptance of Surg Lt Cdr Grainge’s research by the New England Journal of Medicine.

However, the clear winner of this year's research prize was Surg Lt Williams with his presentation about the European Working Time Directive, and how he devised a management system to overcome some of the short-falls. His presentation directly affected everyone in the room, and it was encouraging to see a junior military surgical trainee gripping the bull by the horns and attempting to improve his and his colleagues' training in an organised and effective way.

Following the success of this research forum, the next research forum will coincide with the SpR Study Day 2012 and a calling notice will be issued around two months prior to the study day and is open to all Royal Naval Medical Officers in training posts.

Abstracts

Bismuth Thiol's potentiate the effect of systemic antibiotics on infection in an animal model of contaminated open fracture

"Jowan G. Penn-Barwell, MRCS; Joseph C. Wenke, PhD

Infection remains a serious and common complication of open fracture. Bacteria persist in open fracture wounds despite irrigation, debridement and the use of systemic antibiotics partly due to their ability to form biofilms. Bismuth-thiols (BTs) have been shown in vitro to disrupt biofilms. This study screened BTs for efficacy potentiating systemic antibiotics (SyAbs) in reducing infection in an animal model of contaminated open fracture.

This study used a segmental defect rat model contaminated with Staphylococcus aureus and treated with surgical debridement 6 hours after injury and 3 days of systemic cefazolin. BTs suspended in a hydrogel were added to the wound immediately after debridement. After 14 days bone and hardware was harvested for separate microbiological analysis, the principle outcome was the presence of bacteria on the hardware or bone. Statistical analysis was performed with Fisher’s test.

A dose of 0.05mg of the BT designated MB-8-2 when combined with cefazolin resulted in an infection rate of 10% compared with 60% in the cefazolin only group (p = 0.0022), and a complete absence of local and systemic toxic effects.

These results demonstrate that topical, local administration of BTs can synergize with SyAbs to decrease the rate of wound infections in vivo. This is a novel approach demonstrating the ability to dramatically reduce the rate of wound infections. This
approach may additionally allow for reduced therapeutic doses of SyAbs, while the combination may help prevent development of antibiotic-resistance. Additional studies with locally administered BTs in combination with SyAbs are anticipated, and may lead to a new standard of care in wound treatment.

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The Epidemiology of Cross Country Skiing Injuries


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There is little literature about the epidemiology of injuries sustained whilst conducting cross country skiing due to the disparate nature of these athletes. The Royal Marines regularly deploys to Norway to conduct cross country ski-training and cold weather warfare training which presents a unique opportunity to analyse injuries sustained whilst conducting this sport. A total of 1200 personnel deployed to Norway in 2010 over a 14 week period. Patients who sustained injuries who were unable to continue training were returned to the UK.

All data on personnel returned to the UK due to injury or illness was prospectively collected and basic epidemiology recorded. 53 patients (incidence 44/1,000 personnel) were returned to the UK 20/53 (38%) of all cases were musculoskeletal injuries (incidence 17/1000 personnel).

15/20 musculoskeletal injuries were sustained while conducting cross country ski training (incidence 13/1,000). Injuries sustained whilst skiing: 5/15 sustained anterior shoulders dislocation, 5/15 Grade 1-3 MCL/LCL tears, 2/15 sustained ACJ injuries, 1/15 crush fracture T11/T12, 1/15 tibial plateau fracture and 1/15 significant ankle sprain.

The most common injury regardless of cause was anterior shoulder dislocation 6/20 (Incidence 5/1000)

Our results suggest that cross country ski training has a high injury rate requiring evacuation back to the UK. In our study group the high injury rate is possibly due to the rapid transition from non-skier to skiing with a bergen and weapon. Doctors covering Royal Marine training should have appropriate sports and exercise medical training and rehabilitation units supporting the Royal Marines, should expect sudden increases in referrals when large scale cross country ski training is being conducted.

The Team Doesn’t Work: The Trial of a EWTD Compliant, Firm-Based Junior Doctor Rota in The Cardiothoracic Unit at Derriford Hospital

R Williams1, J Wilcox2, A Wilkins3, A Marchbank3.

Restrictions in the working hours of junior doctors were outlined in 1991 with hours reducing initially to 72 hr/week in 1994, 56 hr/wk in 2004 and 48 hr/wk in 2008. Many authors have demonstrated the negative impact of such restrictions on surgical training and trainee satisfaction. We sought to implement a novel, firm-based, European Working Time Directive (EWTD) compliant roster, to maximize training opportunities for core surgical trainees within the Cardiothoracic Directorate at MDHU Derriford.

A retrospective analysis was conducted of the existing team-based roster and the trial roster, assessing trainee, trainer and patient satisfaction, as well as an audit of trainee logbooks and a financial evaluation.

Within the trial roster consultants were paired, creating 4 surgical firms. Each core trainee was assigned to a specific firm responsible for pre-operative assessment, assisting in theatre and junior doctor peri-
operative care. Staff grade doctors and foundation trainees rotated within the directorate providing cover for surgical firms and support for the Cardiac Intensive Care Unit.

Analysis revealed an increase in trainee and trainer satisfaction, a significant increase in operations logged by surgical trainees, and a similarly favorable patient experience. The new roster also resulted in a yearly saving of £39,000 to the directorate.

Although the EWTD has been shown to negatively affect surgical training and the operative experiences of junior doctors, this study supports the theory that the utilization of well-constructed rosters can minimize this impact.

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Cutaneous Leishmaniasis in Royal Marines from Oruzgan, Afghanistan

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Leishmaniasis is an infectious disease caused by *Leishmania* protozoa and occurs as a spectrum of clinical syndromes ranging from various forms of cutaneous leishmaniasis (CL) to mucosal leishmaniasis (ML) and visceral leishmaniasis (VL). CL in Afghanistan is either zoonotic (ZCL) due to *L. major* or anthroponotic (ACL) due to *L. tropica* and there has been a prolonged epidemic of ACL in eastern Afghanistan since 1987. However, there have been remarkably few reports of CL due to *L. tropica* amongst foreign troops serving in Afghanistan since 2001. We describe two such cases in Royal Marines deployed to Oruzgan Province in Afghanistan from 2008-9. These patients illustrate important issues regarding the clinical features, referral, diagnosis, treatment and epidemiology of CL amongst foreign troops in Afghanistan. This disease has the potential to cause significant disruption to military personnel and units and so requires efficient management in order to maintain operational effectiveness. The lesions are often ignored by the patients as in both our cases, despite the issuing of warning cards and repeated health briefs. The diagnosis can be picked up at a variety of stages in the medical system, and it is the responsibility of all medical officers to include it in their differential diagnosis of any skin lesions that occur following a deployment to Afghanistan.

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Repeated bronchoconstriction without additional inflammation induces airway remodelling in asthma

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(Due to copyright reasons this abstract is not listed, the paper by the same author can be found in the NEJM)

Royal Naval Medical Service Preparation for Afghanistan: Medical Cases Seen

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40 Commando Royal Marines deployed to the Sangin District Centre (SDC) in March 2010. During this time primary care and trauma care was provided by a Royal Navy general duties medical officer (RNGDMO), working independently with a Population at risk of around 680.

We conducted a prospective analysis of all attendances to the medical centre at SDC over a 5 month period. Recording basic
epidemiological data, injury/illness type and mechanism.

In a 5 month period there were 1200 primary care consultations and 150 battle field trauma cases and 14 acute medical emergencies. The 3 main injury types were 52 Gun-shot wounds; 31 Fragmentation and 23 Improvised Explosive Device injuries. On 3 occasions the medical team had to deal with 5 or more battle casualties at the same time. 50% of fresh cases (600) were UK troops, of these 200 were GI complaints, predominantly diarrhoeal illness, 100 were dermatological, 80 ENT and 30 were ophthalmic.

Or results demonstrate what RNGDMOs and general practitioners (GPs) can expect to be confronted with when deploying to forward operating bases (FOBs) in Afghanistan. Whilst improvements have been made to the New Entry Medical Officer (NEMO) and Battle Field Advanced Trauma Life Support Course, in dealing with trauma, it is important that there also be increased focus on the management of mass casualty situations within these courses due to the relatively high numbers of mass casualties.

It is also important that the pre-deployment medical training focus on the different spectrum of diseases seen in Afghanistan. These courses should also aim to have lectures from dermatologists, ENT, ophthalmic surgeons and RN Public Health doctors to ensure our GP/RNGDMOs are correctly equipped to treat these common conditions.