

Exercise HIMALAYAN SERPENT: feedback article

Capt K France RAMC, Surg Cdr A Mellor



Abstract

Exercise HIMALAYAN SERPENT was open to junior doctors from the United Kingdom (UK) Armed Forces and aimed to educate potential expedition doctors on aspects of high altitude and wilderness medicine as well as conducting adventurous training (AT) and medical research. This was the first time such an exercise had been undertaken and this article explores the views of those junior doctors taking part to assess whether the exercise met the aims and objectives it set out.

The objectives of this teaching programme were to provide the junior medical team with knowledge and skills that would improve their ability to be the medical officer on expeditions in the future. By the end of Exercise HIMALAYAN SERPENT it was our aim for the junior medical team to feel confident in recognising acute mountain sickness (AMS), in managing it appropriately, and in developing strategies for preventing AMS amongst the expedition party. The course learning objectives were documented in advance of the expedition and the course was recognised with continuing professional development (CPD) points from the Royal College of Emergency Medicine (RCEM). All participants gave their verbal consent to being approached with a questionnaire. In order to gather anonymous feedback a survey was created using Google Documents. This was sent out via email to each of the participants. The results demonstrate that the aims and objectives set prior to the expedition were met and in addition suggested that candidates felt more enthused about their future careers and better-prepared for the role of expedition Medical Officer (MO).

Introduction

The United Kingdom (UK)'s Defence Medical Services (DMS) have the responsibility for maintaining the health of servicemen and women. The DMS are represented wherever British military personnel are deployed, providing medical support to operations, exercises and adventurous training (AT) expeditions all over the world (1). A recent publication by the Ministry of Defence puts this responsibility into perspective as it documents that a total of 192,930 individuals were deployed abroad between 1 April 2007 and 31 October 2014. This total number does not take into account repeat deployments and does not include overseas training exercises or those who were classed as being 'at sea' (2).

UK troops may deploy to high altitude regions on AT, or in order to pursue enemies who seek sanctuary in remote and austere environments (3). During Op. ANACONDA in Afghanistan the United States (US) military suffered around a 10% casualty rate from altitude illness (4) and a subsequent North Atlantic Treaty Organisation (NATO) technology document (5) identified a capability gap in being able to diagnose altitude illness. Acute mountain sickness (AMS) is usually a self-limiting condition but can progress to high altitude cerebral oedema (HACE) or high altitude pulmonary oedema (HAPE), which can be fatal. Symptoms of AMS occur in at least 30% of trekkers in Nepal and so can present a significant threat to recreational trekkers and servicemen and women on AT (6).

The role of the doctor, and the rest of the medical team, extends further than the sole care of servicemen and women. The UK Armed Forces pride themselves on the humanitarian work that they carry out in conflict zones and on peacekeeping missions. A recent article highlighted the words of Colonel Peter Mahoney, at the Defence and Security Equipment International (DSEI) Conference in London in 2013, as he spoke about the contrast between our expectations of casualty care and the reality we face in isolated, poorly equipped areas, which lack even basic infrastructure: *"Wherever there is warfare there will be civilian casualties and brave professional medics - many of them military personnel themselves - prepared to put themselves in the line of fire to provide the very best standards of treatment that circumstances allow. They must adopt a systematic approach and recognise that procedures that promise the best outcome in an advanced field hospital may need to be radically rethought to ensure the best outcome during humanitarian missions"* (7).

	Question	Mean	SD	Range
1	The expedition leadership was suitably experienced and qualified	2	0.0	2-2
2	I felt prepared for the expedition	1.4	0.5	1-2
3	I felt the personal contribution for the expedition was a reasonable amount	1.7	0.5	1-2
4	I felt physically and emotionally challenged during the expedition	0.2	1.2	-1 - 2
5	I will feel more confident as an expedition MO in the future	1.6	0.5	1-2
6	I feel more knowledgeable about my future career	1.5	0.5	1-2
7	I feel more excited about my future career than prior to the expedition	1.8	0.4	1-2
8	I feel I now understand the situations in which military personnel deploy at High Altitude	1.6	0.8	0-2
9	I am able to define High Altitude, recognise normal physiology at High Altitude and describe physiological adaptations	1.9	0.3	1-2
10	I feel able to recognise HA Illness and am able to describe the management options and strategies for preventing HA Illness	1.7	0.5	1-2
11	I feel able to identify the reasons for using a Portable Hyperbaric Chamber, the importance of considering this in expedition planning and the potential problems surrounding its use.	0.2	0.7	-1-1
12	I feel able to differentiate HA Illness from injury and can recognise the effects HA will have on a serious injury	1.5	0.5	1-2
13	I understand the process of medical planning for an expedition and would feel more confident should I be required to do this in the future	2	0.0	2-2
14	I am aware of the different options for analgesia on expedition and recognise the practicalities of travelling with controlled drugs.	1.5	0.7	0-2
15	I feel confident in identifying the components of a medical kit and recognise the constraints associated with being in a remote area	2	0.0	2-2
16	I feel able to identify the challenges of transportation of a sick/ injured patient on expedition and feel able to plan/ co-ordinate an evacuation	1.5	0.7	0-2
17	I feel able to recognise the shocked patient and identify physiological processes leading to priorities of care	1.8	0.4	1-2
18	I feel able to recognise the key features of a serious injury and am able to formulate an immediate management and evacuation plan	1.7	0.5	1-2
19	I found the Case Base Discussions, regarding common presentations at HA and differential diagnoses to consider, useful	2	0.0	2-2
20	Overall the teaching package was well delivered.	2	0.0	2-2

Table 1. Results of the questionnaire survey.

The doctors who are sent on these deployments and who are responsible for these individuals can range from junior ranking officers to the most senior and experienced consultants. The three different services (Royal Navy, British Army and Royal Air Force) have different ways of training their doctors to prepare for these roles. However, all three leave their junior doctors to complete their first two years of training within the National Health Service (NHS) system, with no formal military exposure to the medical role on deployment, exercise or AT. AT thus provides an excellent opportunity for junior doctors to make challenging decisions in remote and often unsupported locations.

Exercise HIMALAYAN SERPENT was open to junior doctors from each of the three services and aimed to educate potential expedition doctors on aspects of high altitude and wilderness medicine as well as conducting AT and medical research. This was the first time such an exercise had been undertaken, and this article explores the views of those junior doctors taking part to assess whether the exercise met the aims and objectives it set out.

Objectives

The objectives of this teaching programme were to provide the junior medical team with knowledge and skills that would improve their ability to be the medical officer on expeditions in the future. By the end of Exercise HIMALAYAN SERPENT it was our aim for the junior medical team to feel confident in recognising AMS, in

teaching programme were to improve medical triage in a remote environment, and the ability to use trekking equipment as useful medical tools. This study sets out to test whether the teaching objectives were met.

Method

The course learning objectives were documented in advance of the expedition and the course was recognised with CPD points from the Royal College of Emergency Medicine (RCEM). Individuals on the course were identified by the Defence Deanery as having completed sufficient core training and had the support of their educational supervisors. All were at the Foundation Year 2 (FY2) stage of training (two years post-graduation from medical school but pre formal military officer training). There were four British Army, four Royal Air Force and two Royal Navy trainees.

All participants gave their verbal consent to being approached with a questionnaire. In order to gather anonymous feedback a survey was created using Google Documents. This was sent out via email to each of the participants. The questions are designed to cover each of the teaching objectives.

Each response was given a score from -2 (strongly disagree) to +2 (strongly agree) on a standard Likert scale. Data analysis was completed using Microsoft Excel 2010 software and the results are listed in Table 1.

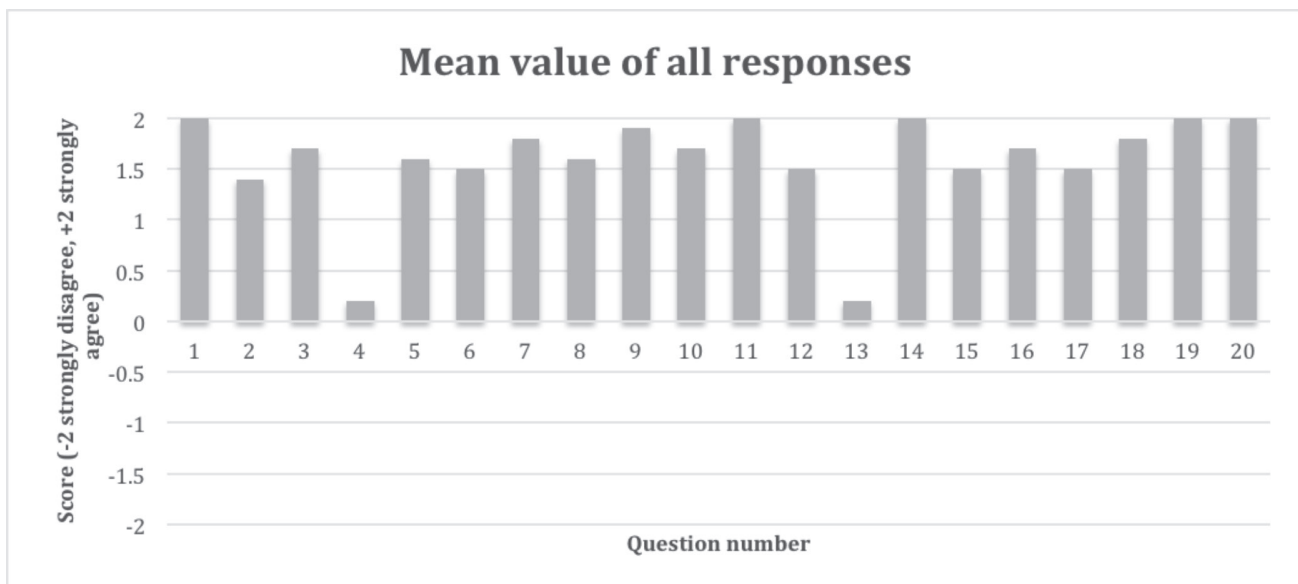


Figure 1. Mean values of questionnaire responses.

managing it appropriately and in developing strategies for preventing AMS amongst the expedition party. In addition, we aimed for the junior team to feel confident in putting together a medical kit, in expedition planning and extraction techniques. Our final objectives from the

Results

All ten participants responded to the survey, and the mean values of all responses are depicted in Figure 1.

Questions 1 and 2 address preparation for the expedition,

with a range 1 to 2. This suggests a good level of satisfaction with this area of the expedition.

Questions 3-7 address personal development with a range -1 to 2. The increased range shown in this set of questions is due to low satisfaction scores in question 4, indicating that some individuals did not consider themselves sufficiently challenged.

Questions 8-12 address the specific learning objectives on High Altitude sickness with a range -1 to 2. Similarly the increased range in this set of questions is due to low satisfaction scores in question 12, suggesting that some individuals lacked confidence in the use of a hyperbaric oxygen chamber.

Questions 13-17 address medical planning for this type of expedition with a range 0 to 2. The smaller range in this set of questions indicates a higher level of satisfaction overall with high levels of general confidence indicated in questions 13 and 15.

Responses to questions 19 and 20 show complete satisfaction with the teaching delivered.

Discussion

Exercise HIMALAYAN SERPENT was aimed at improving a junior doctor's ability to carry out the role of a Medical Officer (MO) in a remote and challenging environment. An important aspect of this role is leadership, a skill that was developed during this exercise but also throughout medical and military training. A paper written by Mellor *et al.* in 2012 looks at the importance of AT in developing this skill, amongst others such as teamwork, adaptability and communication (8). The General Medical Council (GMC) recognises this role: "*The formal leader of the team is accountable for the performance of the team, but the responsibility for identifying problems, solving them and taking the appropriate action is shared by the team as a whole*"(9). Similarly a 2010 American paper by Edler *et al.* looks at the overlap between military and medical leadership roles: "*Both...require fast decision making, often in life and death situations, expertise with uncommon but sophisticated equipment and hardware, and switching of team leadership and membership roles, based on changing situation*" (10).

There was a range of fitness levels and experience on Exercise HIMALAYAN SERPENT, which provided a multitude of challenges individually, for the group as a whole and for the leaders. AT at high altitude exposes the body to harsh weather conditions, difficult terrain and the potential for illness (AMS) and injury in addition to the challenges of living outside with minimal equipment or luxuries. Training in this challenging environment is essential to the

learning process, as it allows individuals to realise they can achieve far more than they initially thought possible (11). These conditions encouraged the group to work as a team; otherwise the exercise would not have been successful.

The results suggest that there was overall satisfaction with this exercise and the teaching objectives were attained. It benefitted the junior doctors on multiple fronts:

- **Leadership:** the junior participants were able to observe leadership skills from experienced, senior medical officers. In addition, these skills were demonstrated in adverse conditions with potentially fatal outcomes should the team have failed to follow instructions, lost focus or not communicated effectively (questions 1, 2, 13, 17, 19 and 20).
- **Teamwork:** at points of this exercise participants would have lost the camp and equipment (due to bad weather and snowfall) had they not worked as a team. Furthermore, participants encouraged each other and worked as a team to complete the mileage that they had to make each day. This is reflected in the answers to the questions relating to personal development (questions 3, 5, 6, and 7), which show high scores. The responses to questions 6 and 7 show those participating in the exercise felt more excited about their future career. The exception was in the perceived lack of personal challenge (question 4) where the range was greater and the authors believe that this reflects baseline physical fitness. Those embarking on the expedition had differing levels of baseline fitness and those who were less cardiovascularly fit found the initial stages of the hike more challenging.
- **Experience:** this expedition illustrated the importance of good medical planning. Given the adverse weather conditions, it was essential that the expedition leaders had the appropriate medical kit and a casualty evacuation plan for each stage of the trek. During the trek these skills were reinforced with regular teaching sessions, which allowed participants to understand the skills and reasoning behind each of the decisions made by the expedition leaders. Questions addressing specific issues relating to high altitude sickness (questions 8, 9, 11 and 12) and general medical planning (questions 13, 14, 15, 16 and 17) suggest high levels of confidence except in the use of a hyperbaric oxygen chamber. This is likely because there was no opportunity to use this piece of equipment as adverse weather conditions took priority in terms of teaching and training. In addition, due to low altitude, no one became susceptible to high altitude pulmonary oedema or high altitude cerebral oedema.

Verbal feedback on various aspects of the objectives is listed in Box 1.

Box 1.

Feedback on teaching

“Excellent teaching from subject matter experts as well as expertise in mountaineering.”

“I enjoyed the group sessions with varied scenarios.”

“Excellent teaching sessions. Even potentially ‘dry’ topics were made more interesting by splitting us into groups and giving us examples to work through and making the session engaging.”

“Working through the expedition medical kit bag was very useful”

“I really enjoyed the teaching session on makeshift stretchers and found it very useful”

“By making our own portable stretchers and testing them on each other allowed us to gain an idea of the difficulties and practicalities of each method.”

Feedback on the overall experience

“Some of the walking conditions were challenging at times – this was character- and fitness-building”

“This exercise has improved my knowledge of the role of the exped MO and how best to prepare as an MO for an expedition.”

“This exercise has reassured me that I will have the skill set required to be a good exped MO in the future.”

“Excellent teaching and invaluable training for any expedition MO”

“Inspirational leaders, who shared their experiences of expeditions: this gave me great insight as to what it would be like to be an expedition MO.”

Areas identified for improvement

“The use of controlled drugs could have been covered in more depth”

“It’s a shame we didn’t get to use the Gamow Bag.”

“More advice on how to co-ordinate medical evacuation plans with local emergency services would have been useful.”

Box 1. Verbal feedback on various aspects of the objectives

Summary

From the results shown above it is clear that the teaching objectives set prior to the expedition were achieved. In addition to meeting the stated aims of the exercise candidates felt more enthused about their future careers

and prepared for the role of expedition MO. The areas identified from the results above that could be improved upon include: teaching on analgesic options in the field; the rules surrounding controlled drugs in a medical kit; and the planning and co-ordination of evacuating an injured or unwell patient. It can be concluded from these results that this was a very beneficial expedition in terms of educating junior members of the team and improving confidence for future expeditions.

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Authors

Captain K France RAMC
James Cook University Hospital
katherine.france@nhs.net

Surgeon Commander A Mellor RN
James Cook University Hospital