Disaster response:
The need for capacity building amongst healthcare professionals

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ABSTRACT

This paper highlights the importance of disaster preparedness plans and appropriate training for healthcare workers to work in such situations. A case study of the 2004 Sri Lankan tsunami is used to describe how medical schools can play a role in disaster situations. Medical schools can contribute in several aspects including provision of clinical care, training of healthcare workers, publications, compilation of expert guidelines, and capacity building amongst communities. Issues and challenges observed by disaster management teams are used to explain how this could be improved to ensure a better recovery. The inclusion of disaster response training components to the medical curricula is recommended to prepare our health workforce for potential future disasters.

Colombo Medical Faculty, staff, and students arriving in Mutthur by a navy boat.

INTRODUCTION

Major disasters such as tsunami, earthquakes and floods cause extensive damage to human lives and properties. The immediate response to disasters is complex in terms of coordination and management as a consequence of this severe destruction of systems. Recovery is usually slow, expensive and requires external support. Over a quarter of a million people lost their lives in the 2004 tsunami and more than 20,000 people are either dead or missing from the 2011 earthquake and tsunami in Japan. In addition to this invaluable human loss, it was reported that the economic cost of the 2004 Asian tsunami totalled US$10 billion and in Japan the cost could exceed US$230 billion. The social and organisational structures that maintain the daily functioning of a society are interdependent and disasters trigger both unexpected consequences and cascading failures. Therefore disaster management requires collective and coordinated responses across all sectors.

The health sector faces critical challenges as it responds in the immediate aftermath of a disaster to minimise further injuries and deaths. To respond in a situation without normal functionality of communication, transportation and staff, health systems need to be adequately prepared and healthcare workers should be trained to meet those challenges. Following the 2004 tsunami, this issue was prioritised in many countries in order to maximise future preparedness. Provision of training and capacity building of healthcare teams are essential components of any comprehensive disaster preparedness plan.

Basic protection principles should be followed by response teams at all times. These principles are explained in the Humanitarian Charter and minimum standards in Humanitarian Response Handbook as:

1. Avoid exposing people to further harm as a result of your actions;
2. Ensure access to impartial assistance – in proportion to need and without discrimination;
3. Protect people from physical and psychological harm arising from violence and coercion;
4. Assist people to claim their rights, access available remedies and recover from the effects of abuse.

This paper will discuss some issues and challenges observed during the aftermath of a disaster by response teams and highlight the need for structured training programmes for healthcare workers including doctors. The lead author has a firsthand experience in organising and participating in response activities within tsunami-affected communities and both authors have worked with medical education teams.

CASE STUDY

A massive earthquake off Northern Sumatra led to a series of tsunamis in countries surrounded by the Indian Ocean. Indonesia, Sri Lanka, the Maldives, India and Thailand were hardest hit.1 The tsunami devastated over 75% of Sri Lanka's coastal belt and severe damage was recorded in the North and Eastern provinces: areas already affected by conflict for over two decades. Over 30,000 people lost their lives within minutes and more than 850,000 were displaced. A shortage of healthcare workers in war affected regions and the destruction of available facilities and public health systems also placed enormous strain on response teams.

The Faculty of Medicine of the University of Colombo, Sri Lanka was one of the first organisations that volunteered to provide healthcare services in affected areas. Both students and faculty members mobilised resources to collect medicines and other essential equipment. Messages were sent on Boxing Day via functioning telephone connections and other accessible methods requesting that all available individuals meet on University premises. Media organisations collaborated with the Colombo Medical Faculty to request donations including essential medicines, dry rations, drinking water, clothes, milk bottles and transportation vehicles.

Groups of doctors and medical students were deployed to affected areas and a coordinating office established at the Medical Faculty Students Union was responsible for contacting relevant authorities in order to identify areas of greatest need and arrange logistics. A telecommunication company provided a free of charge hotline and television and radio networks advertised response team requirements. Local communities responded immediately and within days common medicines were out of stock in pharmacies. Due to the destruction of roads and bridges, the Sri Lankan Air Force and Navy extended their support to transport mobile medical teams to severely affected areas.

Most doctors and medical students involved in this response did not have prior training and subsequently acquired real-time learning in the field. Mobile healthcare teams also delivered clinical care and worked with local public health officers to enhance other services such as safe drinking water, sanitary facilities and health education.

Within days, a large number of local and overseas response teams arrived. Overseas medical students initiated several activities in displaced persons camps in collaboration with the Colombo Medical Faculty. A study conducted amongst internally displaced persons showed that majority were satisfied with the level of healthcare received in the immediate aftermath of the disaster. They also appreciated other public health interventions and noted the decreasing trend of mobile medical team visits after a few weeks. However, several issues were observed during the immediate and intermediate post-event phases. These issues included the uncoordinated arrival of medical teams, inadequate information regarding the identification of areas of greatest need, the donation of unsuitable shelters, and the perceived inability of recipients to manage and distribute large donations.

Whilst external support is crucial for the recovery of victims, there were reports of negative consequences resulting from various humanitarian programmes. In Northern Sri Lanka, a large amount of culturally inappropriate clothes and other materials were distributed and mounting unwanted aid presented both an environmental hazard and a burden to local authorities. Furthermore, aid-mediated communal tension developed as some donors initiated programmes which widened inequalities amongst victims. Zwi et al recommended a reassessment of how our societies and interactions are organised at local and global levels. They also endorsed the review of resource distribution and control to ensure that disaster responses do not worsen situations for victims.

Following the tsunami, the Colombo Medical Faculty established an organisation known as 'The Core Group for Disaster Management' to streamline responses with the participation of Faculty, students and external collaborators. In addition to mobile response teams, two other projects were identified following stakeholder discussion. They were to use the capacity of Colombo Medical Faculty to develop expert guidelines on disaster management and to initiate a short course to train healthcare workers. Both projects were completed within a short time-frame. The first version of the expert guidelines was published in February 2005. This project was funded by the World Bank and World Health Organization, and these guidelines were distributed amongst disaster response teams.

A clinic conducted by Colombo Medical Faculty in the Eastern part of Sri Lanka.

A short course for medical students was started by the Core Group for Disaster Management. International collaborations were established to improve disaster management capacity building. The Asia Pacific Academic Consortium for Public Health and its Early Career Network worked together to organise several workshops and community level capacity building activities. These activities included topics such as leadership, management of communal kitchens, storage of safe drinking water, disease prevention measures and supporting vulnerable groups. A certificate level course was started for healthcare workers to enhance their ability to respond to ongoing relief activities and prepare them for future disasters. A detailed description of the approaches used for curriculum development and content of this course is available elsewhere.

CONCLUSIONS AND RECOMMENDATIONS

Lessons learnt from 2004 tsunami highlight the importance of early preparedness and trained response teams to provide optimal support for victims of a disaster. Skills and training required to work in disaster situations may change from one situation to another, but core skills can be provided for medical students during their undergraduate degree. Some medical schools can provide students with firsthand practical experience if such events are common within country, whilst other institutions can utilise alternative methods including videos and expert lectures.

Healthcare workers play a major role in enhancing the protection of victims during the vulnerable period in the immediate aftermath of a disaster. Therefore, medical curricula should incorporate disaster response training components and healthcare workers should receive training to understand the actual needs of victims, to respect local culture and to avoid further harm.

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ARTICLE : REVIEW

The autonomic nervous system

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Aidan O'Donnell is a consultant anaesthetist at Waikato Hospital in Hamilton. He graduated from Edinburgh in 1996 and trained in anaesthetics in the South East of Scotland. He also has an Honours degree in Anatomy. He became a consultant in 2007, and moved to New Zealand in early 2010. He has a special interest in anaesthesia for childbirth, and enjoys teaching students and junior colleagues. His book, Anaesthesia: A Very Short Introduction, is due to be published in 2012.

Brigid was born on Hayling Island, near Portsmouth on the south coast of England. She studied medicine at the University of Edinburgh and remained in Edinburgh for two years as a junior doctor. She is currently working at the Palmerston North Hospital as a paediatric registrar while trying to decide between career paths in emergency medicine or obstetrics & gynaecology. In the meantime, she is enjoying the increased availability of outdoor activities and has taken up white water kayaking, mountain biking, surfing, tramping and rescuing penguins.

ABSTRACT

This is a short accessible review of the autonomic nervous system for medical students. The sympathetic and parasympathetic systems are different anatomically and physiologically. Parasympathetic nerves are all either cranial nerves (notably the vagus nerve) or sacral nerves (from S2, 3, 4). The sympathetic nervous system emerges only from the spinal cord between T1 and L2. Any sympathetic supply above this must travel upwards from T1. For the organism as a whole, the most important parasympathetic nerve is the vagus nerve. In a spinal injury, the vagus nerve is spared, whereas the extent to which the sympathetic innervation is lost depends on the site of injury.

INTRODUCTION

The autonomic nervous system is a part of the nervous system which functions "automatically" without a conscious control, to regulate physiological processes in the body.

Functionally it is divided into two: the sympathetic nervous system and the parasympathetic nervous system. Although these are often mentioned as a pair and appear together on diagrams, they are quite different functionally, anatomically and physiologically. In general, these two components of the autonomic nervous system act in opposition to one another.

Autonomic nerves may carry sensory (afferent) signals to the brain and spinal cord, or efferent signals from the brain to the target organs. Central control of the autonomic nervous system comes mostly from the hypothalamus, with some input from the limbic system and the reticular activating system.

Table 1. Functions of the parasympathetic nervous system

Constriction of the pupil (miosis)
Lacrimation
Salivation
Slowing of the heart (bradycardia)
Production of bronchial secretions
Production of digestive juices from stomach, pancreas and gallbladder
Peristalsis
Sphincter relaxation
Urination and defecation
Penile erection

THE PARASYMPATHETIC NERVOUS SYSTEM

Physiologically, the functions of the parasympathetic nervous system can be thought of as *"rest and digest"* (see Table 1). These include salivation, production of digestive juices, peristalsis, urination and defecation. Throughout the parasympathetic nervous system, the neurotransmitter is acetylcholine. Drugs such as atropine block the effects of acetylcholine

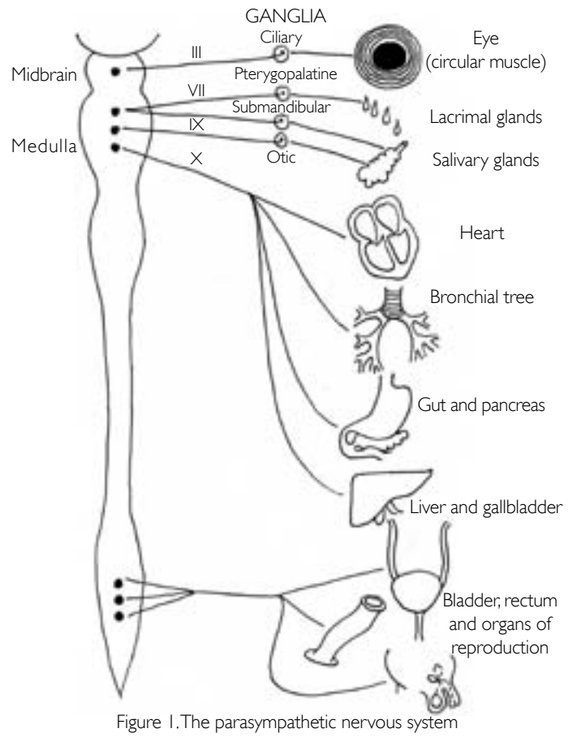

Figure 1. The parasympathetic nervous system