Trends in Anaesthesia and Critical Care xxx (2018) 1–5

Contents lists available at ScienceDirect

Trends in Anaesthesia and Critical Care

journal homepage: www.elsevier.com/locate/tacc

Safe anaesthesia in unsafe corners of the world

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ARTICLE INFO

Article history:
Received 26 December 2017
Received in revised form
18 March 2018
Accepted 16 April 2018

Keywords:
Safe anaesthesia
Low resources environment
Patient safety

ABSTRACT

Humanitarian organizations like the International Committee of the Red Cross (ICRC) provide surgical services in countries where the clinical standards may be lower than those described as minimal and some surgical procedures cannot be considered safe [6]. In times of armed conflicts and widespread violence, health care systems become more vulnerable and are unable to respond to population needs.

Since 2015, the ICRC has followed the *International Standards for a Safe Practice of Anaesthesia* ratified by the World Federation of Societies of Anesthesiologists (WFSA).

The ICRC's anaesthesia equipment and drugs kits are designed to conduct safe anaesthesia even in very basic settings and the institution has published an *Anaesthetic Handbook* [2] to provide guidance for anesthetists working in these austere environments.

Even when working in an environment affected by armed conflict, minimum standards for pre, peri and post -operative care must be applied. The choice of anaesthetic techniques will have to be adjusted to suit the environment, equipment and professional competencies of the team.

Particular challenges exist where conflict has damaged medical infrastructure, and health care financing is facing significant gaps.

Furthermore, these settings might be affected by lack of supplies of drugs and equipment, especially controlled drugs due to security regulations or embargoes/sanctions. Skilled local staff may have fled to protect themselves and their families. All these factors will add to the challenges of providing surgical services in a country traumatized by war.

1. Introduction

Access to safe surgery and anaesthesia in low and middle income countries (LMICs) has recently been highlighted in the 2015 The Lancet Commission on Global Surgery [3]. This shows that standards of anaesthesia and surgery have been not been a priority in the many LMICs. A core indicator for improvement of surgical services is a minimum specialist workforce density of at least 20 specialist (surgical, anaesthesia and obstetric physicians) per 100 000 population by 2030. A recent global workforce survey by WFSA has mapped the distribution of physician anaesthesia providers per 100 000 population in 2015 and 2016 [5]. The findings are discouraging and the authors acknowledge that a target of five anesthetists per 100 000 population is more realistic.

The work of ICRC is predominantly in LMICs area affected by armed conflict. These countries may already have low numbers of specialist staff but these will be further reduced if local health staff are forced to flee in the face of threat to the personal safety of themselves and their families. In these situations expatriate anaesthesia and surgical teams may need to support compromised health care systems (Fig. 1).

The core of ICRC surgical activity is to provide care and treatment for weapon wounded patients and other lifesaving surgery. An exception is the Weapon Traumatology Training Centre (WTTC) project in Tripoli (Lebanon) which provides specialist reconstructive surgery for patients with chronic sequelae of weapon injuries.

In 2017 ICRC surgical projects have performed a total of 34 032 operations, (50% general surgery, 13% pediatric,17% orthopedic, 3% reconstructive surgery, 1% gynecology).

Providing anaesthesia in low resource environment has additional challenges requiring flexibility and adaptability. Specialist referral is usually very difficult or impossible due to disruption of the local health care system. The anaesthetist must be able to deliver a broad spectrum of activities including pediatric and adult cases. Experience of trauma management and caring for patients in a high care environment are also vital. All ICRC anaesthetists must therefore have a full specialist registration and at least two years' experience at that level.

In 2017 in ICRC surgical projects general anaesthesia was

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https://doi.org/10.1016/j.tacc.2018.04.009
2210-8440/

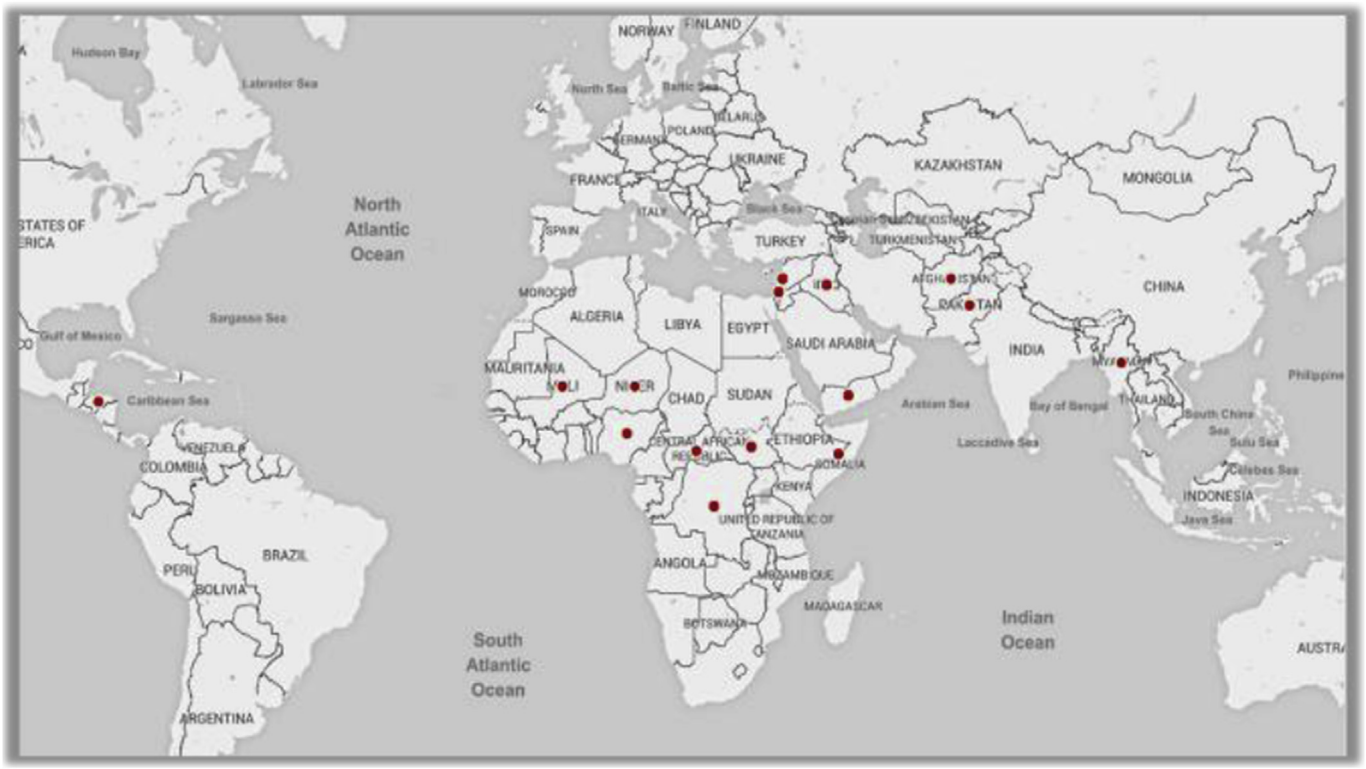

Fig. 1. The ICRC surgical projects in 2017.

provided for 58% of surgical cases. Ketamine anaesthesia with spontaneous breathing accounts for the majority of cases (42%). General anaesthesia with intubation accounts for 16% of cases.

Regional anaesthesia was provided for 26% of surgical procedures. This includes spinal anaesthesia and an increasing number of regional blocks using ultrasound.

Even in the most challenging conditions patient safety is paramount. It is imperative to deliver anaesthesia procedures in the safest way adhering to minimum standards. The ICRC has adopted the 2010 *International Standards for Safe Practice of Anaesthesia* [1] endorsed by the WFSA with whom the ICRC formed a liaison committee in 2015.

2. The main challenges

In the developed world anaesthesia has become a medical speciality which is supported by expensive and complex equipment. Anaesthetists are highly trained doctors who are increasingly dependent upon that equipment to provide effective and safe anaesthesia. This is further supported by innovative drugs and delivery systems.

An anaesthetist who is trained in a modern environment may be significantly challenged when those facilities do not exist. Working in austere, unsafe and ruined environments where modern medical infrastructure has never existed or been destroyed by armed conflict requires a significant readjustment. Limited supplies of power, water, equipment and drugs is inevitable. Other challenges will include professional, patient, equipment, infrastructural and the local environment. An ICRC anesthetist in the field needs to be a highly trained, up to date and experienced professional who can adapt their professional knowledge to an unpredictable, unusual or unknown scenario.

2.1. Professional challenges

The ability to provide safe anaesthesia with limited resources for war-wounded patients in hospitals situated in conflict areas is personally and professionally demanding. An anaesthetist's resources will be stretched when providing safe anaesthesia care to critically ill patients have suffered major trauma. This will be made even more difficult without access to invasive monitors, ventilators, transfusion services, advanced airway devices and a limited range of drugs. Working in unsafe, devastated and low resources environments requires significant professional flexibility, resilience and adaptability.

2.2. Patient challenges

In ICRC hospital projects, most of the patients are war or weapon wounded (gun shots, stabbing, blasts, land mines, burns), road traffic accidents and obstetric emergencies. Patients assisted in these projects will be of all ages from birth to old age. Many will have travelled long distances to reach ICRC hospitals by foot or carried by their family and their already poor condition will be exacerbated by time, infection, anaemia, dehydration and poor nutrition. This makes their treatment and rehabilitation even more difficult. Communication with patients and carers will also be difficult with cultural and language barriers.

2.3. Equipment challenges

In a low resource environment shortage or absence of equipment and drugs are to be expected. In all ICRC surgical projects, the basic and minimal standards of non-invasive monitoring (SpO2, NIBP,ECG/HR, EtCO2) are guaranteed. The range of anaesthetic

Please cite this article in press as: S. Janjanin, et al., Safe anaesthesia in unsafe corners of the world, Trends in Anaesthesia and Critical Care (2018), https://doi.org/10.1016/j.tacc.2018.04.009