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Managing a front-line field hospital in Libya: Description of case mix and lessons learned for future humanitarian emergencies

Gérer un hôpital de terrain sur la ligne de front en Lybie: Description de plusieurs cas et leçons tirées pour les futures urgences humanitaires

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Abstract Between June and August 2011, International Medical Corps deployed a field hospital near the front-line of the fighting between government troops and opposition fighters in Western Libya. The field hospital cared for over 1300 combatants and non-combatants from both sides of the conflict during that time period, the vast majority of them presenting with war-related injuries. Over 60% of battle-related injuries were due to shrapnel wounds and blast injuries from exploding small mortars, with smaller percentages due to battle-related motor vehicle accidents, gun shot wounds, burns, and other causes. The most pertinent lessons learned from our experience were the importance of dedicating significant resources to logistics and supply chain management,

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the rewards garnered from building strong ties with the local community early in the deployment of the field hospital, and the need to pay careful attention to basic principles of humanitarian ethics.

Abstract Entre juin et août 2011, International Medical Corps a déployé un hôpital de terrain près de la ligne de front des combats entre les troupes du gouvernement et les opposants en Lybie occidentale. L'hôpital de terrain a pris en charge 1300 combattants et non combattants des deux camps du conflit au cours de cette période, la plupart d'entre eux présentant des blessures de guerre. Plus de 60% des blessures liées aux combats étaient des blessures dues à des éclats d'obus et à des explosions provenant de petits mortiers, un faible pourcentage étant dû à des accidents de véhicules motorisés, à des blessures par balles, des brûlures et autres causes. Les leçons les plus pertinentes tirées de notre expérience étaient l'importance de consacrer des ressources significatives à la logistique et à la gestion de la chaîne d'approvisionnement, les bienfaits engrangés en développant de solides liens avec la communauté locale dès le début du déploiement de l'hôpital de terrain et la nécessité de prêter attention aux principes élémentaires de l'éthique humanitaire.

African relevance

- Civil conflict necessitating humanitarian response often occurs in Africa.
- Humanitarian organizations should respond in a practical and appropriate manner.
- Community support is essential to humanitarian aid programs.
- The great diversity in Africa highlights the importance of impartial aid delivery.
- Medical support systems are often unreliable in areas of conflict.

Introduction

In February 2011, after more than four decades under the continuous rule of Colonel Muammar al-Gaddafi, the people of Libya began to push for regime change. The uprising began in the eastern city of Benghazi, but rapidly spread to areas within western Libya, including Misurata, Zawiya and the Nafusa Mountains region. Colonel Gaddafi's government responded, instructing troops and supporters to quell the uprising, thus pushing the country into civil war. Although opposition forces would eventually achieve their goal of removing him from power, it would come only at great human and economic cost. Though precise morbidity and mortality data are not available, the National Transitional Council estimated that as many as 30,000 people were killed and 50,000 injured during the 6 months of fighting.[1]

As physicians working in Libya during this time with the humanitarian aid organization International Medical Corps, a US-based, global, non-profit agency with extensive experience in complex emergencies,[2] we witnessed many of the direct human costs first-hand. Our role in Libya was conceptually simple: set up and manage the operations of a field hospital on one of the most active front-lines of the conflict. However, the work was anything but simple, and required constant rethinking and retooling of plans and approaches that are traditionally used both by physicians and humanitarian workers alike.

There is little published literature regarding recommendations on how humanitarian organizations should conduct the operations of a field hospital on the ground during complex humanitarian emergencies; it is likely that the political and social complexity of civil war precludes the establishment of standard universal guidelines. The World Health Organization guide on the use of foreign field hospitals in disasters focuses on natural, sudden-onset disasters, which is certainly unlike the situation faced in Libya. As an example, as per WHO recommendations, we were able to construct the field hospital as a mobile, self-contained unit; however rather that being totally self sufficient, we necessarily relied heavily on local input and participation for our operations.[3]

Field hospital description

The International Medical Corps field hospital was initially set up in the small town of Dafnia, 30 km west of Misurata and 4 km east of the front line. We installed the field hospital in an old farmhouse, both to have adequate space to work in and to have some protection from any mortars that may land nearby. The goal of this hospital was twofold: (1) to treat and send home patients with minor wounds, thus off-loading other area health facilities and (2) to stabilize critically injured patients who would subsequently be transferred to the major receiving hospitals in Misurata.

In spite of the rudimentary structure in which we functioned, our capabilities were remarkably sophisticated. We had the ability to perform several invasive procedures such as intubations and chest tube placements and had high-tech diagnostic capabilities such as X-ray and ultrasound. The field hospital also housed an operating theatre that was utilized on a selective basis for patients not expected to survive the 30-minute transfer time to Misurata without definitive care. Our staff numbers fluctuated somewhat over time, but generally included

2–3 expatriate physicians with emergency medical and surgical experience, 3–6 local Libyan physicians of various specialties, and 4–8 nurses. With this workforce the hospital treated over 1300 patients in the 2 months between June 18 and August 19.

Field hospital case mix

In the 8-week period between June 18 and August 11 for which comprehensive data is available, the International Medical Corps field hospital treated 1167 patients, including 869 new patients and 298 follow-up visits. While this represents an average of 21 patient visits per day, the daily logs varied from 6 patients to 130 patients, depending on the intensity of fighting at the time. Combat tended to be heavier during the early morning and evening hours, likely due to the fact that it was difficult to fight during the intense heat of mid-day.

Very few civilians presented for care at the hospital, reflecting the flight of this population from the area surrounding Dafnia as the fighting had intensified in the weeks prior to our arrival. The vast majority of patients were combatants from the revolution who were seen for battle related trauma, including both penetrating trauma from gun shot wounds or exploding ordinance and blunt trauma from battle related motor vehicle accidents. The majority of patients treated fell into the category of "walking wounded," often with secondary blast injuries due to shrapnel from exploded mortars. All told, of the 869 primary visits, 694 patients (80%) were discharged home and were advised not to return to the front line, although we anecdotally learned that they often returned to combat immediately despite our recommendations.

After treatment at the field hospital, 161 (18%) were transferred to a referral hospital for definitive care, 8 (1%) were held for observation or had major operations at the field hospital, and 6 (1%) died. About 2/3 of new visits to the field hospital were due to battle-related trauma, with the remainder due to medical, psychiatric, on non battle-related trauma. Of the visits for battle-related trauma, 63% were due to blast injuries with or without shrapnel, 5% were due to battle-related road traffic accidents, 4% were due to burns, 2% were due to gun shot wounds, and 26% were due to other causes. Fig. 1 below provides a breakdown of all visits by type.

Discussion

Hospital management is always a complex enterprise, and no place more so than in an active combat zone. However, there are several important lessons that can be drawn based on our experience in Libya which we believe may be applicable to field hospitals operating in similar settings in other parts of Africa or the developing world.

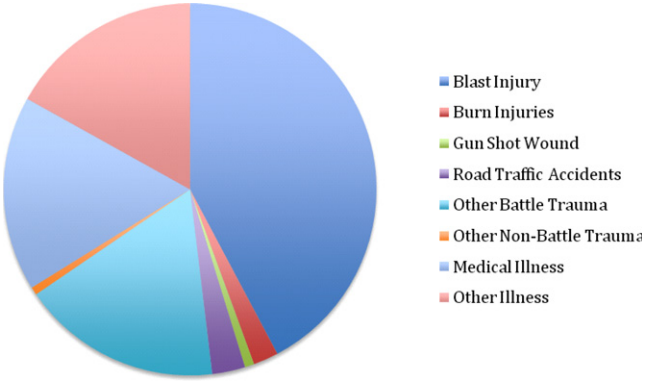

Fig. 1 Visits by type.

The patient-care activities of medical personnel is extremely important, but is only part of the work that is involved in field hospital operations; without strong logistical support and supply chain management the hospital will not be able to provide quality care for patients and may actually worsen outcomes by delaying transfer to a facility that can adequately manage patient needs. Ensuring adequate stocks of medication and supplies during a complex political emergency can be extraordinarily difficult due to communication and transportation constraints within country as well as importation barriers. In addition, the rapidly shifting context of an active war may require packing up and moving the field hospital, as we had to do twice, which requires significant human, monetary, and logistical resources to accomplish.

Second, community support is vital in any global health project, and the generosity of our Libyan hosts with donations of time, labor, and supplies was critical to the success of our field hospital. Though the hospital was managed by International Medical Corps, a significant percentage of staff and volunteers were Libyan. In addition, local Libyan individuals, hospitals, and pharmacies donated much of the supplies and medications used at the field hospital. This was important for several reasons. Local Libyan support lent legitimacy to the field hospital and also helped advertise its presence, so that injured patients were taken there preferentially instead of attempting to drive them to more distant clinics and hospitals. Perhaps more importantly though, the insecurity of Libya at that time made it difficult (and dangerous) to recruit large numbers of expatriate volunteers, and the lack of a functioning airport or shipping port made it difficult to import large quantities of medications and supplies from abroad.

Third, while strict adherence to humanitarian principles can often be difficult in these contexts, upholding the basic ethical principles of humanitarianism, as enshrined in the Red Cross/Red Crescent Code of Conduct,[4] remains vitally important. In the Libyan conflict, as in many similar conflicts, there was a clear front-line, and you could only place your field hospital on one side of it or the other, as it certainly was not safe to place it in the middle. The decision of which side to place the field hospital was made for us, as the Transitional National Council gave us access to areas under their control while the Libyan government did not.

Due to our location, we ended up treating far more opposition fighters than government soldiers. However, we treated combatants and non-combatants from both sides of the conflict with the same degree of dedication and compassion, taking extra care to ensure that wounded troops loyal to Colonel Gaddafi received appropriate care when they had to be transferred to referral hospitals in Misurata, in order to preserve equality of treatment for wounded soldiers from both sides. Our Libyan counterparts held the utmost respect for this principle as well, as was also described in other areas of Libya during this conflict.[5] All told, the IMC field hospital treated hundreds of trauma victims over 2 months in Libya, and our experience highlights the necessity of adaptive planning, the requirement for flexibility in medical practice, and the importance of strong community support in humanitarian assistance.

Conflict of interest

The authors declare no conflicts of interest in the writing of this manuscript.

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Appendix A. Short answer questions

1. Establishing community support for a global health project is important because it
   a) Guarantees free donation of goods and supplies to the project
   b) Prevents the theft of materials from the organization
   c) Lends legitimacy to the project and to the humanitarian aid workers
   d) Allows an organization to act however they please
   e) None of the above

2. What are some of the most important aspects of field hospital operations?
   a) Medically appropriate patient care
   b) Strong logistical support
   c) Solid supply chain management
   d) A & B
   e) All of the above

3. As described in the article, what is one basic ethical principal of humanitarianism?
   a) Disarming all comers onto hospital grounds
   b) Treating all patients with respectful and compassionate care based on need
   c) Protecting yourself at all costs
   d) Treating only civilians during a conflict
   e) All of the above

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