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## Reducing maternal mortality in conflict areas: Surgical-anesthetic experience in Boost Hospital – Afghanistan<sup>☆</sup>



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#### ABSTRACT

**Introduction:** Helmand province, whose capital is Lashkar-Gah, is one of the most volatile provinces affected by the conflict in Afghanistan. Doctors without Borders began to work in Boost Hospital in 2009.

**Method:** Retrospective review of surgical procedures at the Doctors without Borders Operational Center in Brussels, February 11, 2010 to September 30, 2012.

**Results:** 5719 surgeries were performed on 4334 patients. 47% were emergency interventions and 75% were first interventions. 39.7% ( $n=1721$ ) of patients were female. In the Gyneco-obstetric (G) area, the average age was 31.3 years. 848 Cesarean operations (76%) were performed and 95% of these were urgent. Of these patients ( $n=598$ ) 64% were at ASA II. Spinal anesthesia (SA) was administered in 44.4% ( $n=415$ ) of patients, followed by general anesthesia without intubation (GA–) in 39.3% ( $n=367$ ). In 16% ( $n=151$ ), general anesthesia was administered with endotracheal intubation (GA+). Transoperative mortality was 0.8% ( $n=7$ ).

**Conclusions:** The Boost Hospital offers a surgical service of relevance in the south of Afghanistan. This hospital is supported by Doctors without Borders (MSF) and has helped to reduce the maternal mortality in that region through the provision of quality care in obstetric emergencies. By applying health standards, and medical teams and material, MSF has helped the Afghan population, particularly gestating mothers, to improve its health while achieving a transoperative mortality in Cesareans of <1%.

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## Reduciendo la Mortalidad Materna en zonas de conflicto: Experiencia quirúrgica-anestésica en el Hospital Boost, Afganistán

### R E S U M E N

#### Palabras clave:

Mortalidad materna  
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**Introducción:** Helmand cuya capital es Lashkar-Gah es una de las provincias más volátiles entre las más afectadas por conflictos en Afganistán. Médicos sin Fronteras empezó a trabajar en el Hospital Boost en 2009.

**Método:** Revisión retrospectiva de procedimientos quirúrgicos en Médicos sin Fronteras-Centro Operacional de Bruselas del 11 de febrero de 2010 al 30 de septiembre de 2012.

**Resultados:** Se realizaron 5719 cirugías a 4334 pacientes, siendo de urgencia un 47% y primera intervención un 75%. 39.7% ( $n = 1721$ ) de pacientes fueron de género femenino. En relación al área Gineco-obstétrica (G), la edad media fue de 31.3 años. Se realizaron 848 cesáreas (76%) de las cuales el 95% fueron urgentes. De estas pacientes ( $n = 598$ ) el 64% era ASA II. En cuanto al tipo de anestesia, se administró Anestesia espinal (SA) en un 44.4% ( $n = 415$ ), seguido de anestesia general sin intubación (GA-) en un 39.3% ( $n = 367$ ), y en un 16% ( $n = 151$ ) se administró anestesia general con intubación endotraqueal (GA+); con una mortalidad transoperatoria de 0.8% ( $n = 7$ ).

**Conclusiones:** El Hospital Boost brinda un servicio quirúrgico de relevancia en el sur de Afganistán. Dicho hospital es apoyado por Médicos sin Fronteras (MSF), lo cual ha ayudado a reducir la mortalidad materna en esa región con la provisión de asistencia de calidad en emergencias obstétricas. Con la aplicación de estándares de salud, equipo, y material médico, MSF ha logrado que la población afgana, y particularmente las gestantes, mejore su salud, logrando una mortalidad transoperatoria de intervenciones por Cesáreas de < 1%.

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## Introduction

Providing surgical care in a conflict zone is often associated with victims of violence. Nevertheless, in many conflicts, the majority of surgical care is provided by non-military actors – including humanitarian organizations – that work with limited resources.

A recent study in the Democratic Republic of Congo showed that mortality from obstetric emergencies and random injuries in conflict zones were four times higher than mortality due to violence.<sup>1</sup>

In many situations, the population is more vulnerable to threats such as poor hygiene, poor nutrition, contagious diseases, rape, and poor prenatal care. Obstetric emergencies contribute to mortality, and, in these cases, surgical interventions contribute in an important way to reducing deaths.<sup>2</sup>

The population of Afghanistan has lived in conditions of poverty with a general lack of access to medical care, particularly secondary health care, for decades. Most Afghans must choose between poor-functioning public hospitals or costly private clinics. Furthermore, due to the lack of security in the country, people in need had to travel hundreds of kilometers through highly dangerous areas to access care.<sup>3</sup> Afghanistan is a country located in the heart of Asia, part of a bloc of countries between the Indian subcontinent and the Middle East.<sup>4,5</sup> It has a surface area of 647,947 km<sup>2</sup> and a population of 32,358,000 inhabitants with a low human development index rating (HDI ranking 175). 24% of Afghans live in urban areas.<sup>6-8</sup>

When the Soviet Union was present in Afghanistan, some health infrastructure was built. Many health services – up to

80% – have been supported by non-governmental organizations, including MSF.<sup>6,9</sup> Afghanistan has a maternal mortality rate of 460 per 1000 live births.<sup>10</sup> In 2001, when the Taliban regime fell, Afghanistan had one of the worst health indicators in the world.<sup>6,7</sup> The maternal mortality ratio (MMR) is an important measure of the level of maternal health and has been used to measure international development of one of the 8th Millennium Development Goal which is reducing MMR by 75% between 1990 and 2015 (ODM5). In order to achieve these goals, it is necessary to expand access to emergency obstetric care and to provide access to antibiotics, oxytocics, and anti-convulsants, blood transfusions and cesarean sections.<sup>11,12</sup>

Afghanistan is a country with a critical lack of doctors and paramedical personnel. To resolve the problem of a lack of health workers in remote areas, the health sector supports a program of community training for midwives. In addition, community health volunteers are trained, and new health care centers are opened to improve the quality of health care of millions of people in rural areas.<sup>13</sup> This increases the national coverage of primary health care.<sup>6</sup>

Doctors Without Borders has supported the Boost Hospital since 2009. This hospital is one of the two referral hospitals in southern Afghanistan. Doctors Without Borders, also known by its French name *Médecins sans frontières* (MSF), is an international humanitarian organization that provides aid to populations affected by armed conflicts, epidemics, natural disasters, as well as those excluded from health systems, regardless of race, religion, gender, or political affiliation. MSF has provided surgical services for more than 40 years and currently runs projects in more than 70 countries.<sup>2,14,15</sup> The team in Boost has improved the provision of medical care through

several departments including maternity, pediatrics, internal medicine, surgery, and emergency care. By the end of 2011, the hospital admitted an average of 1500 patients per month. In addition, external consultations were also offered to which more than 6000 patients per month attend. Many of these travel from areas outside Lashkar-Gah.<sup>16,17</sup> Due to the reigning insecurity, MSF could not carry out activities involving active referrals with institutional ambulances, something which is a pillar of health care provision. Instead, it had to restrict itself to simply receiving patients that arrived by their own means to the hospital.<sup>18</sup>

This study intends to describe the surgical-anesthetic activity carried out at Boost Hospital located in the city of Lashkar-Gah in Helmand province, Afghanistan. During the period of study, these activities were supported by the NGO Doctors Without Borders (*Médecins sans frontières* – MSF).

## Method

The Brussels Operational Center of Doctors Without Borders (MSF-BOC), one of the five operational centers worldwide, is responsible for collecting data from projects around the world. The data from all of the surgical procedures performed in the operating room are recorded using a standard form developed by MSF. This data is transcribed monthly into an electronic database. This data is then reviewed in the Brussels Operational Center.<sup>19</sup>

Boost Hospital is a unit with 180 beds and is equipped with services of maternity, pediatrics, internal medicine, surgery, intensive care unit, emergency radiology, laboratory, and two operating rooms, 24 h per day. In the Boost Hospital operating rooms the following personnel is on call: head of the room, anesthetist nurse, 8 anesthetic technicians, and one expatriate anesthesiologist.<sup>13</sup> Close to 30% of emergency cases come from outside Lashkar-Gah, sometimes from areas more than 150 km away. This suggests there is a lack of services in remote districts.<sup>3</sup>

For this study, a review of the statistical database of Boost Hospital for the period from February 11, 2010 to September 30th, 2012 was carried out. Variables of age, gender, surgical indication, and type of anesthesia were included. The surgical indications were classified as trauma (violence, accident), non-traumatic pathology (infection, ischemia, tumor, hemorrhage), or obstetric (prenatal and postnatal). Surgical procedures classified as minor included those related to wounds, visceral surgery, orthopedic surgery, gynecological/obstetric surgery, and specialized surgery.<sup>20</sup>

As a retrospective review, this study complies with the ethical criteria of exoneration of the MSF review board.

## Results

Of the surgical patients, the male group predominated with 2613 patients (60.3%). The average age was 27.7 years with a range of 1–95 years. The main age group was 20–40 years. Of these, 52% ( $n=22,680$ ) patients were classified as ASA II, and 38% ( $n=1647$ ) were ASA I. 47.2% ( $n=2698$ ) of patients required emergency surgery. 75% ( $n=4334$ ) of patients underwent surgery for the first time. Of these, the causes of the

**Table 1 – List of gynec-obstetric procedures performed in Boost Hospital, 2010–2012.**

Procedures	Number	%
C: Cesarean	847	77
EP: Ectopic pregnancy	12	1.1
VF: Vesicovaginal fistula	1	0.1
HV: Hysterectomy and variants	64	6
U: Urology	46	4.1
PCA: Placenta + curettage + abortion	21	1.2
O: Others	115	10.3
Total	1107	100

Source: Authors.

**Table 2 – List of anesthetic procedures in gynec-obstetric surgeries, Boost Hospital, 2010–2012.**

Type of anesthesia	Number	%
General anesthesia without intubation (GA–)	367	39.3
General anesthesia with intubation (GA+)	151	16.1
Local anesthesia (LA)	2	0.2
Spinal anesthesia (SA)	415	44.4
Total	935	100

Source: Authors.

intervention were trauma (T) in 44.3% of cases ( $n=2540$ ), 38.5% ( $n=2222$ ) non-traumatic pathology (P), and 17% ( $n=957$ ) obstetric patients (O).

Of the 5719 surgical procedures that were performed, 31.4% ( $n=1795$ ) were visceral surgeries (exploratory laparotomy, hernioplasty, hemorrhoidectomy, etc.), 24.4% ( $n=1398$ ) were wound surgeries (W: debridements, fasciotomies, finger amputations, etc.), and 19.3% ( $n=1122$ ) were gynec-obstetric surgeries (C: Cesarean sections, ectopic pregnancies, vesicovaginal fistula, hysterectomy and variants, curettage, postpartum complications and others). The average surgical time was 50 min.

In terms of the type of anesthesia, 57% ( $n=3258$ ) used general anesthesia without intubation (GA–), 10% ( $n=560$ ) used general anesthesia with endotracheal intubation (GA+), 21% ( $n=1219$ ) used spinal anesthesia (SA), and 12% used other types. The transoperative mortality was 0.3% ( $n=15$ ) and 0.9% ( $n=50$ ) of patients received a blood transfusion.

In the gynec-obstetric area (G), the average age was 31.3 years, with a range of between 12 and 90 years. 848 Cesarean sections (76%) were performed. Of these, 95% were emergency C-sections (Table 1). The surgical indication was fetal or maternal. Postpartum complications were not observed. Of these patients ( $n=598$ ), 64% were ASA II. When it comes to the type of anesthesia, spinal anesthesia (SA) was administered in 44.4% ( $n=415$ ) of cases, followed by general anesthesia without intubation (GA–) in 39.3% ( $n=367$ ), and general anesthesia with endotracheal intubation (GA+) in 16% ( $n=151$ ) of cases. Transoperative mortality was 0.8% ( $n=7$ ) (Table 2).

## Conclusions

In Boost Hospital, the surgical area is primordial due to the quantity of procedures performed. No statistical references are available to carry out a comparative analysis.

This hospital is supported by the NGO Doctors Without Borders. With the application of rigorous standards of health and minimal requirements for surgical activities, including infrastructure, medical team, and medical material, as well as strict adherence to policies, directives, and institutional therapeutic protocols, this organization has contributed to improved health among the Afghan population by achieving a transoperative mortality rate of 1%.<sup>7</sup> At the same time, after having performed 848 Cesareans and 58 interventions due to complications in the postpartum period, Boost Hospital helped, in this period, to directly reduce maternal mortality in this region. The hospital continues to offer this support at the present time.

### Ethical disclosures

**Protection of human and animal subjects.** The authors declare that no experiments were performed on humans or animals for this study.

**Confidentiality of data.** The authors declare that no patient data appear in this article.

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### Conflicts of interest

The authors have no conflicts of interest to declare.

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