Where There Is No Trauma System: A Successful Patient Evacuation in the Republic of Kiribati

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ABSTRACT

Research is lacking around how best to approach trauma care in resource poor settings, particularly in remote areas such as the islands of the South Pacific. Without examples of successful treatment of high-risk cases in these settings, countries are unable to move forward with developing policies and standardized procedures for emergency care.

The Republic of Kiribati is a Pacific Island nation composed of 33 islands spanning over 2,000 miles in the central Pacific Ocean. With the only hospital located on Kiritimati Island and inadequate boat transportation, the government recently committed to providing an aircraft for patients to receive appropriate medical care. In 2016, a 20-year-old female, primigravida, on a neighboring island, failed to progress in labor for 24 hours and needed an emergency cesarean section. A radio call was made to Kiritimati, and a team consisting of a general surgeon, nurse, and a laboratory technician was dispatched. The patient was brought to the local clinic and flown to Kiritimati where a team was prepared to perform the cesarean section.

The successful patient evacuation emphasizes the importance of a dedicated health care team, government commitment, and the constant quality communication when approaching feasibility of trauma and emergency care. (*Disaster Med Public Health Preparedness.* 2019;13:774–776)

Key Words: global health, low income settings, patient evacuation, trauma system strengthening

The Republic of Kiribati is a Pacific Island nation composed of 33 islands spanning over 2,000 miles in the central Pacific Ocean. The capital, Tarawa, has a population of over 80,000 and is located 2,051 miles from the easternmost island of Kiritimati with an estimated population of 5,500. Kiritimati has a district hospital, Ronton Hospital, with 3 specialists: a general surgeon, an obstetrician gynecologist, and an anesthesiologist. The 15-bed facility has a laboratory, maternity ward, X-ray and ultrasound access, and 1 operating room. Ronton Hospital is the referral center for the 3,000 persons living on Fanning and Washington Islands, 165 and 240 miles away, respectively.

Prior to 2016, whenever there was a critical medical emergency on the outer islands, a team from Ronton Hospital would be dispatched via boat. Such journeys would take 3 or 4 days, and often had unsatisfactory results. In February 2016, the Kiribati government began providing flights to the outer islands twice a week from Cassidy International Airport on Kiritimati. These flights allowed patients from neighboring islands to seek care at Ronton Hospital and then return home after their treatment. Flights were also available for emergency medical evacuations.

CASE DESCRIPTION

An urgent patient evacuation became necessary on Monday, December 6, 2016 when shortly after 8:00 AM a radio call was received at Ronton Hospital from the health center on Washington Island concerning a 20-year-old, primagravida female who was followed for antenatal care and had no prior medical problems. She went into labor 24 hours before the call was placed but failed to progress. She was reportedly stable, and fetal heart tones were within normal limits. She would most likely require a cesarean section. Because there are no surgical personnel on Washington Island, a team consisting of a general surgeon, nurses, and a laboratory technician was dispatched from Kiritimati. The team carried all of the necessary equipment for an emergent operation if that was to be needed.

After a 1-hour and 45-minute flight, the team arrived on Washington Island where the patient was found to be hemodynamically stable. The fetal heart tones were 121. The local nurses had been unable to pass a urinary catheter, and, on examination, the patient had a distended bladder. A suprapubic tap drained 400 ml of urine. She was transported to the small local airport and flown to Ronton Hospital. An emergency cesarean section was performed and both mother and

child did well. They were later discharged and returned back to Washington Island in good condition.

The evacuation was successful due to the (1) presence of a dedicated health care team on both islands, (2) government's commitment to provide an aircraft to connect the islands, and (3) constant quality communication that took place throughout the evacuation. Documenting this medical evacuation emphasizes the importance of establishing a standardized process for traumatic and emergency surgical care in remote, low-resource settings.

DISCUSSION

Implementing an organized trauma system in low-resource settings has been shown to decrease mortality by 15%-20% among patients and cause a 50% decrease in medically preventable deaths.[1] A trauma response system consists of 3 major components: prehospital care, hospital-based care, and a system administration.[1,2] Building and strengthening these 3 components in low- and middle-income countries (LMICs) creates the capacity necessary to avert millions of deaths and much disability.[1–6]

Without proper assessment of the unmet surgical need or documentation of trauma management in remote LMICs, such as the islands of the South Pacific, moving toward a standardized approach to care is difficult.[7–9] Surgical care disparities must be framed in a way that emphasizes the magnitude of the problem and why building surgical capacity should be at the forefront of health system strengthening.[10–12] Quantifying the need and assessing local capacity for responding to common emergencies are essential to maximizing the use of limited resources and increasing the chance of a successful evacuation and treatment for patients in low-resource settings. Similarly, expanding access to and training in modern technologies within the community, such as a virtual reality training program to better enhance community health workers' skill set or increased ultrasound access to monitor fetal progress, can greatly impact patient care in the interim before reaching the hospital.

Creating an efficient response to medical emergencies in remote and isolated settings often requires strengthening local prehospital care.[7,10,13] Inadequate transport and unpaved roads are the leading causes of delays to reaching care for individuals in LMICs.[10,14] In countries surrounded by water, evacuation procedures present an additional barrier; because effective air transport is expensive and water transport varies in reliability, it is crucial to establish emergency training procedures for individuals within the community. Increasing the number and distribution of trained health care workers within each community reduces costs and compensates for transportation barriers that may arise.[14,15] Promoting active involvement of the community in trauma care creates a local system equipped to decrease the negative impact caused by delays in access to hospital care. This streamlined approached proved to be a key factor in the success of the Washington Island evacuation. Establishing adequate prehospital care involves investment in training programs and technologies that allow quick communication between the community health workers and the care providers at the main hospital. This concept provides an opportunity to explore the use of simulation training for community health workers as well as video conferences with physicians who are able to talk through patient stabilization and next steps until reaching a health care facility.

These modalities can improve a patient's chance of survival as well as avoid the use of unnecessary resources if the problem is able to be managed locally.

Equally as important as community training is establishing government commitment to further strengthen emergency response systems. Emergency and surgical care capacity in remote areas of LMICs is often limited by lack of resources, equipment, and funding. With proper government support, strides can be made to implement standardized trauma protocols through providing local community workers with essential equipment and allocating funds for efficient evacuations.[6,7,16]

Funding for ultrasound equipment in the case of women's health and pregnant patients as described previously, would greatly reduce the risk of adverse effects and increase the capacity of health care workers within the community. In addition to finances for equipment and transportation, government support is needed for policy development, which ensures sustainability within the country and reproducibility in other similar settings.[16]

The success of the Washington Island evacuation was dependent on the timely response and communication from the island to Ronton Hospital, highlighting the importance of constant quality communication and an organized administration between local health workers and district level hospitals.[7,13,17]

Having an established and reliable form of communication between health care teams at the hospital and in the community allowed the local team to better assess the degree of the problem and target limited resources for the emergency at hand.

Constant communication decreased the delay in care through immediate actions on the community level and preparedness on the district hospital level. Exploring the use of technologies, such as video conferences to better enhance communication and on-the-spot instruction from the hospital to the community, provides a unique opportunity to impact the care of patients and further decrease chances of adverse effects due to lack of proper care.

The success of this emergency evacuation underscores the importance of having a system in place and the resources to provide quality care. While some may question the expense needed to provide such a system, given the relatively small

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and young population, the ability to save lives significantly affects the well-being of community members in remote settings. By providing a dedicated aircraft, there is also the possibility to transport larger numbers of victims in the event of a mass casualty event.

Ultimately, this evacuation speaks to the priorities of the local community and the government decision-makers who feel that it is an important response. Political will and grassroots support are frequently the driving force in health care interventions and take precedence over other seemingly more cost-effective measures. For the citizens of Kiribati, this is an important program and one that other remote locations may wish to emulate.

CONCLUSION

This patient evacuation illustrates successful community and hospital level care in low-resource settings that can be replicated while also providing a framework on how best to develop rudimentary trauma systems in a setting such as that of the islands of the South Pacific. The Washington Island evacuation provides an example for developing a sustainable emergency care system in LMICs to improve health outcomes for patients through documenting trauma cases and surgical capacity within the country, extending training to personnel in more remote communities, and assuring adequate equipment and transportation through government support.

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