[Downloaded free from http://www.njcponline.com on Saturday, July 21, 2018, IP: 197.210.131.74]

ORIGINAL ARTICLE

Experience in the management of the mass casualty from the January 2010 Jos Crisis

KN Ozoilo, I Amupitan[1], SD Peter, EO Ojo, BO Ismaila, M Ode[1], AA Adoga[2], AS Adoga[2]

Department of Surgery, Division of Trauma Surgery, Accident and Emergency Unit, Jos University Teaching Hospital, Departments of [1]Orthopaedics and Trauma and [2]Ear Nose and Throat, Head and Neck Surgery, Jos University Teaching Hospital, Jos, Nigeria

Abstract

Background: On the 17 of January 2010, a sectarian crisis broke out in Jos the capital of Plateau state, Nigeria. It created a mass casualty situation in the Jos University Teaching Hospital. We present the result of the hospital management of that mass casualty incident.

Objective: To share our experience in the management of the mass casualty situation arising from the sectarian crisis of Jos in January 2010.

Methodology: We retrospectively reviewed the hospital records of patients who were treated in our hospital with injuries sustained in the Jos crisis of January 2010.

Results: A total of 168 patients presented over a four day period. There were 108 males (64.3%) and 60 females (35.7%). The mean age was 26 ± 16 years. Injury was caused by gunshots in 68 patients (40.5%), machete in 56 (33.3%), falls in 22 (13.1%) and burning in 21 (13.1%). The body parts injured were the upper limbs in 61(36.3%) patients, lower limbs 44 (26.2%) and scalp 43 (25.6%). Majority, 125 (74.4%) did not require formal operative care. Fourteen (8.3%) patients had complications out of which 10 (6.0%) were related to infections. There were 5 (3.1%) hospital mortalities and the mean duration of hospital stay was 4.2 days. The hospital operations returned to routine 24 hours after the last patient was brought in. As a result of changes made to our protocol, management proceeded smoothly and there was no stoppage of the hospital response at any point.

Conclusion: This civil crisis involved mostly young males. Injuries were mainly lacerations from machete and gunshot injuries. Majority of the victims did not require formal surgical operations beyond initial care. Maintaining continuity in the positions of the Incident commander and the mass casualty commander ensure a smooth disaster response with fewer challenges.

Key words: Conflict, disaster, hospital response, mass casualty, trauma

Date of Acceptance: 21-Sep-2015

Introduction

The sudden presentation of a large number of injured patients to a facility to such an extent that institutional ability to cope is impaired, is referred to as a mass casualty situation.[1] Effective hospital response typically involves expansion of the surge capacity which involves mobilizing additional resources; first from within the hospital and subsequently from without to provide care for the injured.[2,3]

A slight diminution in the quality of care is also observed with trauma care, with resources being diverted from less

Address for correspondence:
Dr. KN Ozoilo,
Department of Surgery, Division of Trauma Surgery, Accident and Emergency Unit, Jos University Teaching Hospital, P. M. B. 2076, Jos, Nigeria.
E-mail: drkenozoilo@yahoo.com

Access this article online

Quick Response Code:

Website: www.njcponline.com

DOI: 10.4103/1119-3077.179276

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Ozoilo KN, Amupitan I, Peter SD, Ojo EO, Ismaila BO, Ode M, *et al*. Experience in the management of the mass casualty from the January 2010 Jos Crisis. Niger J Clin Pract 2016;19:364-7.

[Downloaded free from http://www.njcponline.com on Saturday, July 21, 2018, IP: 197.210.131.74]

critically injured to more critically injured but salvageable patients.[1,4] The major challenge in mass casualty is identifying the few severely injured patients (that require urgent lifesaving interventions), who are mixed with less severely injured patients (who can endure delays and even suboptimal care) so that the scarce trauma care assets may be diverted in favor of the former.

Previous mass casualty situations in our facility resulted mainly from road traffic collisions[5] until September 9, 2001,[6,7] when we experienced an event from sectarian/civil violence. The peculiarity of this etiology meant that we could not mobilize personnel and materials from outside the hospital due to the ongoing violence in the streets. This necessitated changes to our mass casualty management protocol to accommodate the challenges experienced.[6] The changes made were tested in November 2008 and again in January 2010. On January 17, 2010, violence broke out in Jos and resulted in a mass casualty situation at the Jos University Teaching Hospital. We present the results of the hospital response to that mass casualty incident and the impact of changes made to our mass casualty management protocol.

Methods

Study setting

The Jos University Teaching Hospital is located in Jos, Plateau State in North Central Nigeria. It is a 500-bed capacity hospital with a 14 couch Accident and Emergency Unit. The hospital has a dedicated trauma team providing a 24 h cover. It has the full complement of other specialty units including general surgery, orthopedics, neurosurgery, urology, plastic and burns, pediatric surgery, anesthesia, and trauma care is carried out by a multidisciplinary team.

Study design

We retrospectively reviewed the records of patients who presented following the sectarian violence of January 2010. This comprised the crisis, accident and emergency, hospital and operating room registers of patients who were treated at our hospital. The information extracted included the demographics of the patients, cause of injury, the body parts affected, management and outcome of treatment. Hospital response to the mass casualty situation proceeded according to our previously described mass casualty management protocol, the Jos protocol.[5-8] We also analyzed the results of our debriefing sessions for strengths and weaknesses of the response effort. At debriefing, all hospital personnel who were involved in the mass casualty management met and discussed all aspects of the response. Those areas where the response plan went well and efficiently are identified and reinforced. Those areas where there were hitches and problems are also highlighted, analyzed, and possible solutions proffered. Other areas that also require improvement are also identified. The identified changes are then incorporated into the hospital disaster management protocol.

Data analysis

Data were obtained using a proforma, result was analyzed using EpiInfo 3.4.1 (Centers for Disease Control and Prevention, Atlanta), and presented in simple descriptive forms.

Results

A total of 168 patients presented over a 4-day period. There were 108 males and 60 females giving a gender ratio of 1.6:1. The ages ranged from 3 months to 75 years, a mean of 26 ± 16 years, and a peak in the 21–30 years age range.

The most frequent cause of injury was gunshots in 68 (40.05%) patients, followed by machete cuts in 56 (33.3%) [Figure 1].

The most affected region of the body was the upper limbs in 61 (36.3%) patients and lower limbs in 44 (26.2%) patients [Table 1].

Initial care entailed the administration of tetanus prophylaxis in 164 (97.6%) patients, antibiotics in 143 (85.1%), analgesics in 135 (80.4%), and intravenous fluids in 78 (46.4%).

Majority 125 (74.4%) of the patients did not require formal operative care, while among those who had surgery,

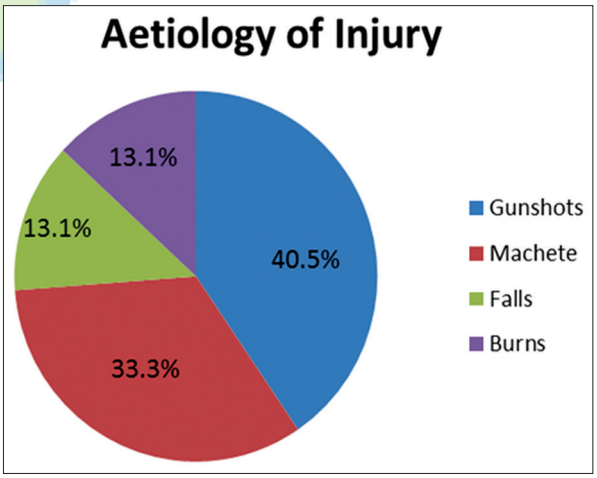


Figure 1: The distribution of the etiology of injury

Table 1: Affected region of the body

Regions	Frequency (%)
Upper limbs	61 (36.3)
Lower limbs	44 (26.2)
Head and neck	47 (28)
Thoracoabdominal	6 (3.6)
Eyes	4 (2.4)
External genitalia	2 (1.2)

Some people sustained injury to multiple body parts

[Downloaded free from http://www.njcponline.com on Saturday, July 21, 2018, IP: 197.210.131.74]

Table 2: Complications recorded

Complications	Frequency (%)
Wound infection	10 (6)
Paraparesis	2 (1.2)
Erectile dysfunction	1 (0.6)
Intrauterine fetal death	1 (0.6)
Total	14 (8.4)

procedures done were debridement in 26 (15.5%) patients, local wound exploration in 11 (6.6%) patients, chest tube thoracostomy in 3 (2%) patients, and exploratory laparotomy in 3 (1.8%) patients. The other procedures which were carried out in the remaining patients included wound dressing in 56 (33.3%) patients and suturing in 47 (30%) patients.

Fourteen (8.4%) patients had complications. Of these, the most common were wound infections in 10 (6%) patients. Table 2 describes the complications seen. There were five hospital mortalities (3.1%). The duration of hospital stay ranged from 1 to 21 days with an average of 4.2 days.

Discussion

The presentation of victims of the crisis at a rate of about 42 patients per day to our hospital over a 4 day period constituted a mass casualty situation for us. As in previous experiences, there was virtually no field triage, no prior notification, and no prehospital care. Transportation and evacuation for both the injured patients and medical personnel were hazardous because of the ongoing violence in the streets. At presentation to the Accident and Emergency Unit, hospital triage was initiated and management of the mass casualty incident followed our earlier described protocol.[5-8]

The civil crisis involved mostly young male adults because they constitute the majority of the fighting force. This finding in civilian crises has been corroborated by other studies in Calabar[9] and Kaduna[10] and Kano.[11] The affectation of both extremes of age, as well as females, some of them gravid, implies the involvement of vulnerable groups. These were mostly victims, not combatants, as the crisis saw groups attacking villagers at night (sometimes with their houses set ablaze while they slept), leaving these defenseless people at the mercy of the assailants following the escape of the more physically fit.

Although the favored weapon of offense among the civilian combatants was machetes, accounting for the many lacerations, gunshots wounds later came to predominate as the violence escalated. This occurred for two main reasons. First, the combatants acquired firearms as the crisis progressed to gain the upper hand and second, the security operatives when called in, used mainly live ammunition to dispel rioters, thereby accounting for the eventual preponderance of gunshot wounds. The machete injuries were mainly to the upper limbs, indicating the defensive nature of wounds against blows to the head and neck region that had lethal intent. This is at variance with studies carried out in Lagos[12] and Benin[13] which suggest a preponderance of abdominal injuries, even though these were mainly studies on gunshot and other penetrating injuries in the civilian assault. This highlights the imperative for security forces to explore and exhaust nonlethal means of crowd control in such disturbances before resorting to live ammunition as this will greatly decrease the casualty rate and mortality associated with such civil unrest. In addition, there is a need to enforce existing legislation to curb the proliferation of fire arms within the civilian population.[14]

Nearly, all the patients (84–97%) required adjuncts such as tetanus prophylaxis, antibiotics, and analgesics, with fewer requiring intravenous fluids during the initial care. Majority of the patients were triage category three patients (delayed, green, or walking wounded). These patients did not require urgent life-saving intervention and did not need any formal surgical procedure. Of those that required life-saving care (category 1, red or immediate and category 2, yellow or urgent groups), the procedures most commonly done were chest tube insertions, exploratory laparotomy, wound exploration as well as minor procedures such as suturing, debridement, splintage, and wound care.

The challenge was the logistic process of identifying the relatively fewer patients with life-threatening conditions among the large pool of patients with comparatively minor injuries; hence the need for effective triage, both in the field and in the hospital. Frykberg[15] reports that the proportion of patients requiring immediate attention varied from 20% to 23% irrespective of the specific cause of the mass casualty. He points out that this leads to an inundation of scarce medical resources with a large number of patients who do not need immediate attention (over-triage), which paradoxically, leads to delay in identifying those few that do (under triage). Generally, however, while a high over-triage rate strains the health system, a high under-triage rate increases critical mortality. It is, therefore, an accepted trade-off that over-triage rates of up to 50% are endured to keep the under-triage rate below the acceptable 5%.[16]

Once identified and treated according to the standard Advanced Trauma Life Support protocol, the outcome is usually good. In our study, the complication rate was low (8.3%) and the mortality was even lower at 3.1%. This further highlights the fact that majority of patients in a mass casualty situation do not, in fact, have severe injuries.[15,16]

The management of the mass casualty from this incident in our hospital followed the principles outlined in our disaster plan - The Jos protocol.[8] It emphasizes a cascade system of call out, beginning with the mobilization of resources from other parts of the hospital to the emergency room, and if this does not suffice, extension to outside the hospital. Following

[Downloaded free from http://www.njcponline.com on Saturday, July 21, 2018, IP: 197.210.131.74]

challenges encountered in other similar crises in September 2001, three modifications were made. The first was to designate an Incident Commander and ensure that the position is not vacant at any time during the disaster response. This is ideally the Chief Medical Director or other highly placed official in a position[17] to authorize the deployment of hospital resources for the response. The second is the Mass Casualty Commander. This is usually the most senior surgeon on ground, and we ensured that at all points in time, there was a designated commander available. In other words, people occupying these positions had to hand over to clearly designated replacements before they could leave the hospital during the crisis response. The last change was the activation of unit specific protocols in each department or unit, thereby enabling continued services by the personnel on ground at the commencement of the disaster response. For the Accident and Emergency unit, this meant that those on duty at the beginning of the response stayed on for the first 24 h and subsequently drew up 12 hourly rosters for consultants, residents, and nurses. Call out and personnel movement (on duty/off duty) were coordinated among the incident commander, the transport division, and the security agencies.

The hospital response proceeded smoothly. There was no incidence of exhaustion of supplies, drugs, blood, or other consumables. The Incident Commander also ensured that personnel required for running operating theaters, laboratories, and other units were brought in as required. Consequently, at no point did the hospital response come to a stop. By 24 h after the crisis, the last patient had been operated upon and the hospital activities returned to routine.

Although our response was a great improvement on previous crises, a few challenges remain. Communication remains a major challenge as is security and other logistics. Field triage and prehospital care remain almost totally absent. This requires efforts by government at local, regional, and national levels to overcome. Changes made in the protocol were not tested in a hospital drill in peacetime, to ensure that they work in an actual event, as such some delays were inevitable in the response. Hospital drills offer the facility the chance to test protocols and correct any deficiencies to ensure that they actually work in a crisis situation.[18,19]

Conclusion

Majority of the patients are young males, the most common injuries are gunshot wounds and lacerations from machetes and most of the patients did not have serious, life-threatening injuries. The few critically injured patients in a mass casualty situation have to be quickly identified by an effective system of triage so that scarce trauma care assets can be allotted to them on the basis of priority. The changes made to our protocol ensured a smooth and uninterrupted response and early return of hospital activities to routine. Institutional disaster response protocols are necessary and need to be modified to provide solutions for challenges encountered in an actual event, although these challenges can also be identified in a mass casualty drill. The absence of prehospital care and lack of advance notification of health facilities remains a challenge that would require a regional effort to solve.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

References

1. Levi L, Michaelson M, Admi H, Bregman D, Bar-Nahor R. National strategy for mass casualty situations and its effects on the hospital. Prehosp Disaster Med 2002;17:12-6.
2. Lumley J, Ryan J. Disaster medicine: An emerging specialty. Hosp Med 2000;61:276-8.
3. Hirscherg A, Stein M. Trauma care in mass casualty incidents. In: Faliciano DV, Mattox KI, Moore EE, editors. Trauma. 6th ed. New York: McGraw-Hill; 2008. p. 141-55.
4. Hirshberg A, Holcomb JB, Mattox KL. Hospital trauma care in multiple-casualty incidents: A critical view. Ann Emerg Med 2001;37:647-52.
5. Nwadiaro HC, Yiltok SJ, Kidmas AT. Immediate mass casualty management in Jos University Teaching Hospital: A successful trial of Jos protocol. West Afr J Med 2000;19:230-4.
6. Ozoilo KN, Pam IC, Yiltok SJ, Ramyil AV, Nwadiaro HC. Challenges of the management of mass casualty: Lessons learned from the Jos crisis of 2001. World J Emerg Surg 2013;8:44.
7. Ozoilo KN, Kidmas AT, Nwadiaro HC, Iya D, Onche II, Misauno MA, *et al.* Management of the mass casualty from the 2001 Jos crisis. Niger J Clin Pract 2014;17:436-41.
8. Nwadiro HC. Principle and Protocol for Mass Casualty Management in Jos University Teaching Hospital. Jos: JUTH Publication Series, Zimek Publication Series; 1998.
9. Udosen AM, Etiuma AU, Ugare GA, Bassey OO. Gunshot injuries in Calabar, Nigeria: An indication of increasing societal violence and police brutality. Afr Health Sci 2006;6:170-2.
10. Garba ES, Asuku ME, Ogirima M, UKwenya Y, Adamu AD, Udenzue N. Civilian conflicts in Nigeria: The experience of surgeons in Kaduna. Niger J Surg Res 2000;2:144-7.
11. John IA, Mohammed AZ, Pinto AD, Nkanta CA. Gun violence in Nigeria: A focus on ethno-religious conflict in Kano. J Public Health Policy 2007;28:420-31.
12. Thomas MO, Ogunleye EO. Penetrating chest trauma in Nigeria. Asian Cardiovasc Thorac Ann 2005;13:103-6.
13. Okobia MN, Osime U. Civilian gunshot wounds in Benin City. Niger Med Pract 2001;39:67-72.
14. Arya N. Confronting the small arms pandemic. BMJ 2002;324:990-1.
15. Frykberg ER. Principles of mass casualty management following terrorist disasters. Ann Surg 2004;239:319-21.
16. Frykberg ER. Medical management of disasters and mass casualties from terrorist bombings: How can we cope? J Trauma 2002;53:201-12.
17. Zane RD, Prestipino AL. Implementing the hospital emergency incident command system: An integrated delivery system's experience. Prehosp Disaster Med 2004;19:311-7.
18. Borgohain B, Khonglah T. Developing and organizing a trauma system and mass casualty management: Some useful observations from the Israeli trauma model. Ann Med Health Sci Res 2013;3:85-9.
19. Ardill W, Kirschner G. Mass casualty drill in a local hospital. Nigerian J Orthop Trauma 2004;3:20-9.