Quest Journals
Journal of Medical and Dental Science Research
Volume 13~ Issue 5 (May 2026) pp: 15-23
ISSN(Online): 2394-076X ISSN (Print):2394-0751
www.questjournals.org

Research Paper

Mass Casualty Incident in Times of Terror: An Analysis of Palm Sunday Mass Casualty Presentation to Jos University Teaching Hospital

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ABSTRACT
Background: *Jos, the Plateau state capital has had recurrent violent attacks or clashes along ethno-religious or farmer-herder dichotomy. On Palm Sunday, 29th March,2026, armed men attacked Angwar Rukuba shooting a number of persons resulting in 71 victims presenting to a 28 couch capacity A&E of Jos University Teaching Hospital over a six-hour period.*
Aim: *To assess the presentation, management and outcome of a mass casualty incidence that presented to Jos University Teaching Hospital following the Palm Sunday violent attack in Angwar Rukuba, Jos.*
Method: *Prospective data of victims of a violent attack was collected on excel spread sheet and analyzed using SPSS IBM Version 23.0. Results are presented in tables, and charts with percentages and ratios.*

Results: *Of the seventy victims brought in over a 6-hour period, 55 were males, 39 were triaged into black category. 61.3% of the living were between the ages of 20 and 29 years. 67.7% were brought in by relatives, and majority had gunshot injuries. 77.4% had injuries to one system and 22.6% were polytraumatized. All the patients were resuscitated, while the commonest definitive treatment was wound debridement with 45.1% of the patients. 58% of the patients had no complication, 35.5% stayed between 10 to 14 days and 16.1% died in the hospital.*
Conclusion: *The Palm Sunday attack in Ungwar Rukuba generated a mass casualty incidence with mainly gunshot injuries affecting mostly young men, single system injuries, with a high field mortality because of poor pre-hospital emergency response which stretched the Jos University Teaching Hospital mass casualty response.*

Key words: *Mass casualty incidence, triage, terror, Jos University Teaching Hospital.*

*Received 02 May., 2026; **R**evised 10 May., 2026; **A**ccepted 12 May., 2026 © The author(s) 2026. **P**ublished with open access at **www.questjournals.org***

I. INTRODUCTION

Mass casualty occurs when there is a sudden presentation of injured people to a health facility in such numbers that the capacity of the facility to cope is overwhelmed. It generates more patients at one time than locally available resources can manage using routine procedures, requiring exceptional emergency arrangements and additional or extraordinary measures and assistance to manage. It is not really about the absolute number, but the number patients relative to available facilities and resources, including time in certain situations. [1] Causes include natural disasters as floods and earthquakes, transportation related accidents and crashes, industrial accidents, or intentional acts like terrorism, shootings, and interpersonal conflicts. Each of these causes generate mass casualties with their peculiarities in presentation, management and outcomes. [2]

In mass casualty situations, triage is a major principle in the management as the primary focus shifts from providing the best care for every individual to doing the greatest good for the greatest number of people. [3] Triage, derived from the French word "trier", which means separating, categorising or classifying, it refers to the categorization, classification, and prioritization of patients and injured people, based on their urgent need for treatment. [3] It is done at various levels, and there are various types [4]. A common form is that of color coding in which patients are categorized into Red(immediate), Yellow(urgent), Green(delayed), and Black or white with black stripes (dead or unsalvageable). Patients coded Red have life threatening issues requiring immediate intervention like air way obstruction, tension pneumothorax or exsanguinating hemorrhage, in order to avoid

fatality. Those coded Yellow can have some delayed in their management in order to sort other critical issues, but may deteriorate into the Red category or improve to Green. The Green category sometimes referred to as the walking wounded are those with minor less significant injuries, that can wait for treatment of the aforementioned two categories. Those labeled Black are those assessed to be dead or fatally wounded and cannot be salvaged. Failure to rapidly and efficiently triage patients in MCI can put the management in disarray with a less than desirable outcome. [5,6]

Terror attacks can take various forms, with varying degree and patterns of injuries. [7,8] Jos, the Plateau state capital has experienced a fair share of terror and violent conflicts along ethno-religious lines, farmer-herder conflicts, terrorist attacks or shear criminal attacks. [9-12] On Palm Sunday of 2026, armed men attacked Angwar Rukuba community, a suburb in Jos, shooting a number of people, provoking a violent conflicts involving firearms, machete and clubs and sticks. Over a 6-hour period, 70 victims presented to Accident & Emergency department of Jos university Teaching Hospital.

We seek to review the presentation, management and outcome of this mass casualty incidence to Jos University Teaching Hospital.

SETTING, MATERIALS AND METHODS

Study location: Jos University Teaching Hospital (JUTH) is a tertiary healthcare institution located in Jos, Plateau State, in North-Central region of Nigeria. It is a 600-bed capacity hospital that serve as a major trauma referral center for both the state and the region. The hospital has a 28-couch A&E, 6-bed ICU, 12-bed HDU, 4 emergency operating rooms, functional blood bank and radiology departments as well as dedicated Trauma Team and all surgical specialties.

Study design: Prospective data was collected on excel spread sheet and transferred to and analyzed using SPSS IBM Version 23.0. Results are presented in tables, and charts with percentages and ratios.

II. RESULTS

A total of 70 victims were brought in over 6-hour period

Figure 1 shows the sex distribution of the patients. The majority of the patients were male (55; 78.6%), while only 15(21.4%) were females, indicating a marked male predominance among the study population.

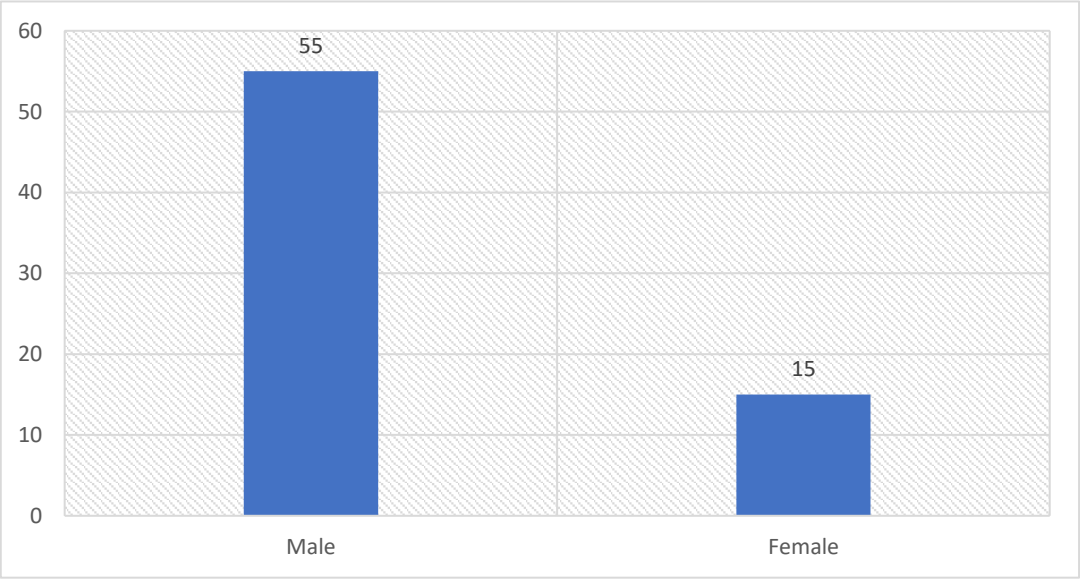

Figure 1: Sex distribution of patients

Figure 2 illustrates the age distribution of the patients. The figure shows a peak in the 20–29 years age group, with a progressive decline in frequency across older age groups, indicating that young adults were the most affected victims.

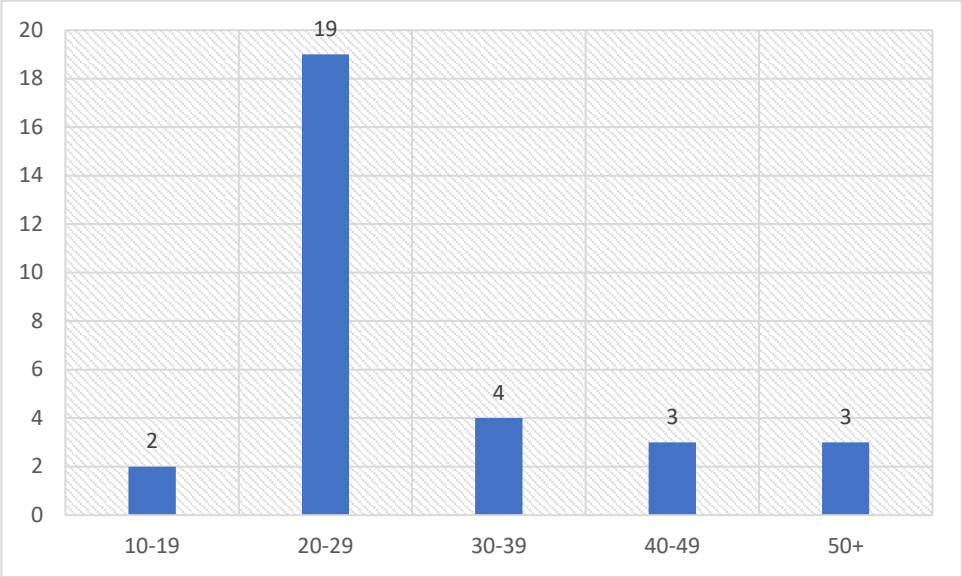

Figure 2: Bar-chart showing age distribution of patients

Figure 3 shows the mechanism of injury among the patients. The majority of injuries were due to gunshot wounds, while a small proportion resulted from machete injuries, indicating that firearm-related injuries were the predominant cause.

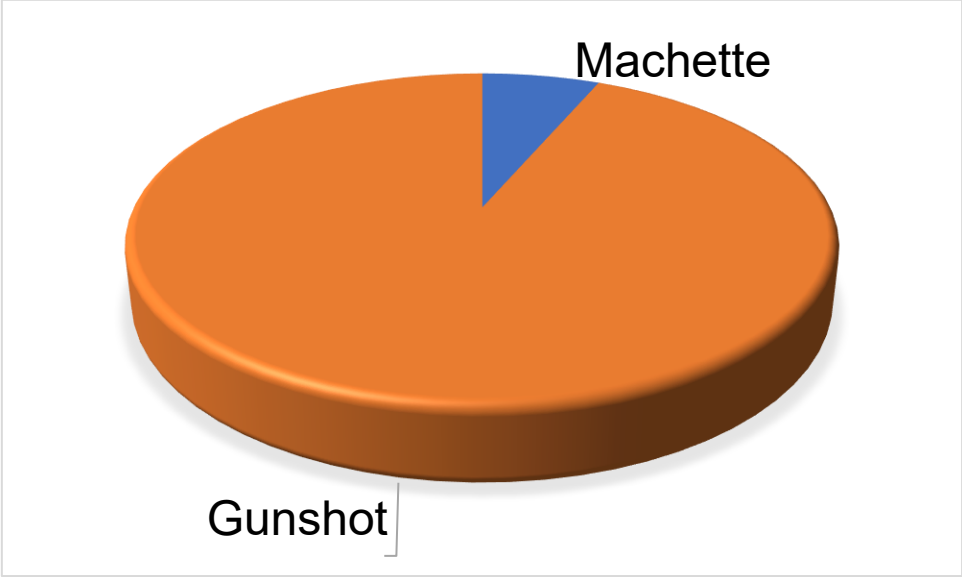

Figure 3: Pie-chart showing mechanism of injury

Table 1 shows that 24 patients (77.4%) sustained injuries single system, while 7 patients (22.6%) had polytrauma (multiple system injuries).

Table 1: Systems injured

SYSTEM	Frequency	Percent
Single system injury	24	77.4
Polytrauma (MSI)	7	22.6
Total	31	100.0

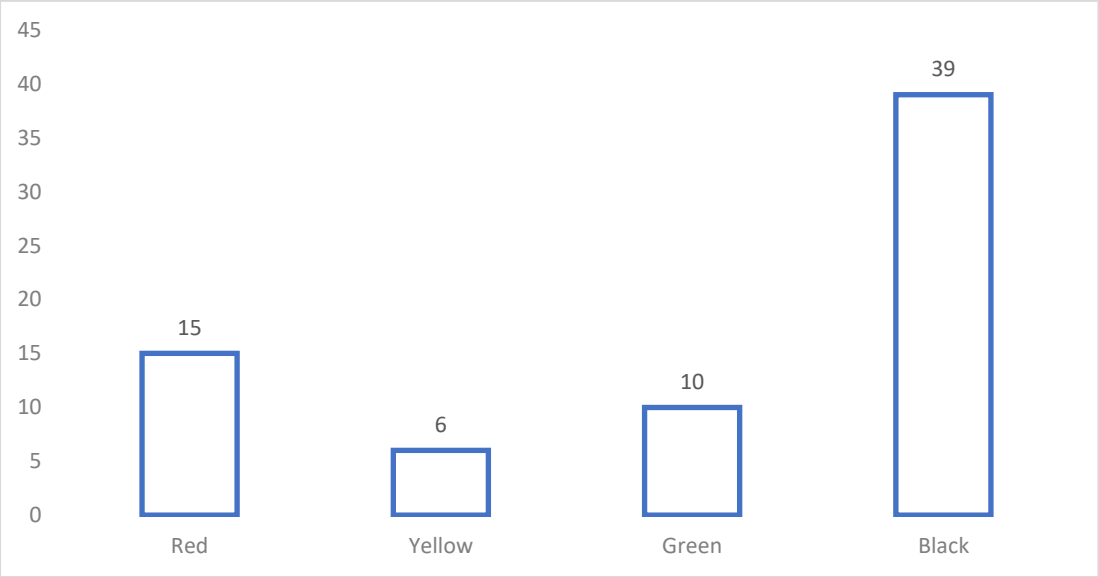

Figure 4: Bar-Chart Showing Triage Category

Table 2 and Figure 4 present the triage categories of patients. The black category accounted for the highest proportion (39; 55.7%), followed by red (15; 21.4%), green (10; 14.3%), and yellow (6; 8.6%).

Table 2: Triage Category

Triage category	Frequency	Percent
Red	15	21.4
Yellow	6	8.6
Green	10	14.3
Black	39	55.7
Total	70	100.0

As shown in Table 3, the majority of patients were transported by relatives (21; 67.7%), followed by Red Cross (6; 19.4%), and security personnel (4; 12.9%).
This suggests that informal transport systems played the most role in patient conveyance.

Table 3: Mode of transportation

Mode of transportation	Frequency	Percent
Red cross	6	19.4
Security personnel	4	12.9
Relatives	21	67.7
Total	31	100.0

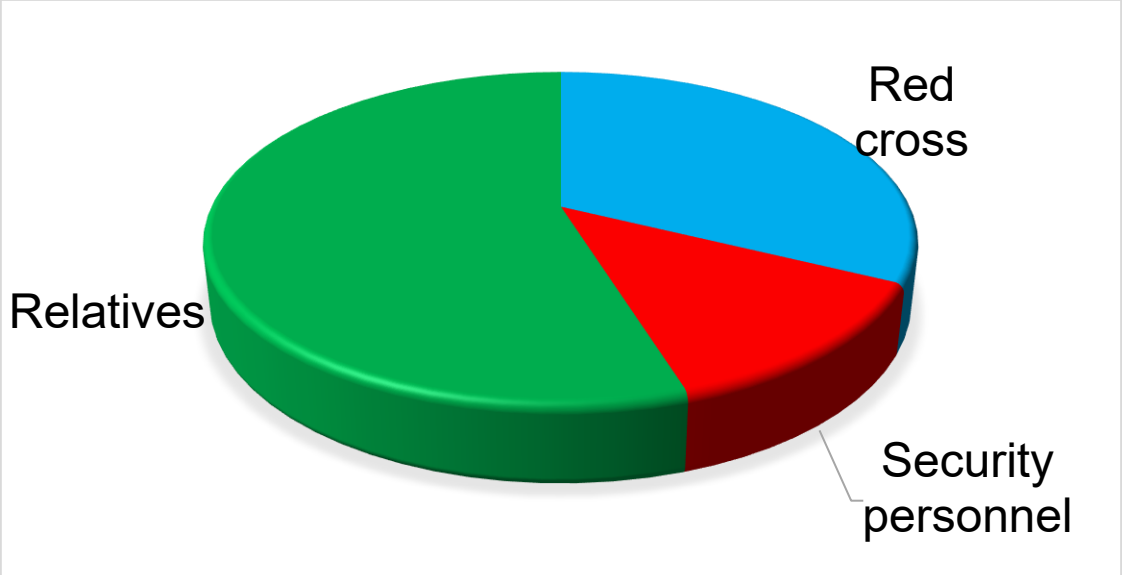

Figure 5: Mode of transportation

Table 4 shows the resuscitation measures administered. The most common intervention was intravenous fluid (IVF) administration (14; 51.9%). Other combination interventions included combinations of IVF with blood transfusion and procedures such as chest tube insertion and endotracheal intubation, though these were less frequent.

Table 4: RESUSCITATION

RESUSCITATION	Frequency	Percent
Chest tube thoracostomy	1	3.7
Endotracheal intubation	1	3.7
IVF	14	51.9
IVF, blood	5	18.5
IVF, blood, thoracostomy	3	11.1
IVF, blood, debridement	2	7.4
IVF, blood, tracheostomy	1	3.7
Total	27	100.0

Table 5 shows that wound debridement (14; 45.1%) was the most commonly performed treatment. This was followed by open reduction and internal fixation (ORIF) (5; 16.1%) and laparotomy (4; 12.9%). A small proportion of patients received no definitive treatment (3; 9.7%).

Table 5: TREATMENT

DEFINITIVE RX	Frequency	Percent
Secondary wound closure	1	3.2
Tube thoracostomy	1	3.2
Enucleation	1	3.2
Laparotomy	4	12.9
Nil	3	9.7
ORIF	5	16.1
SPC, colostomy	1	3.2
Wound debridement	14	45.1
Stump refashioning	1	3.2
Total	31	100.0

Table 6 shows that the majority of patients had no complications (18; 58.1%). Among those who developed complications, wound infection (6; 19.3%) and shock (2; 6.5%) were the most common. Other complications are as shown in Table 6.

Table 6: Complications

COMPLICATION	Frequency	Percent
Death	3	9.6
Limb loss	1	3.2
Nil	18	58.1
shock	2	6.5
Loss of vision	1	3.2
Wound infection	6	19.3
Facial palsy	1	3.2
Urethral stricture	1	3.2
Total	31	100.0

Figure 6 shows the duration of hospital stay. Most patients had moderate hospital stays, with fewer cases requiring prolonged admission.

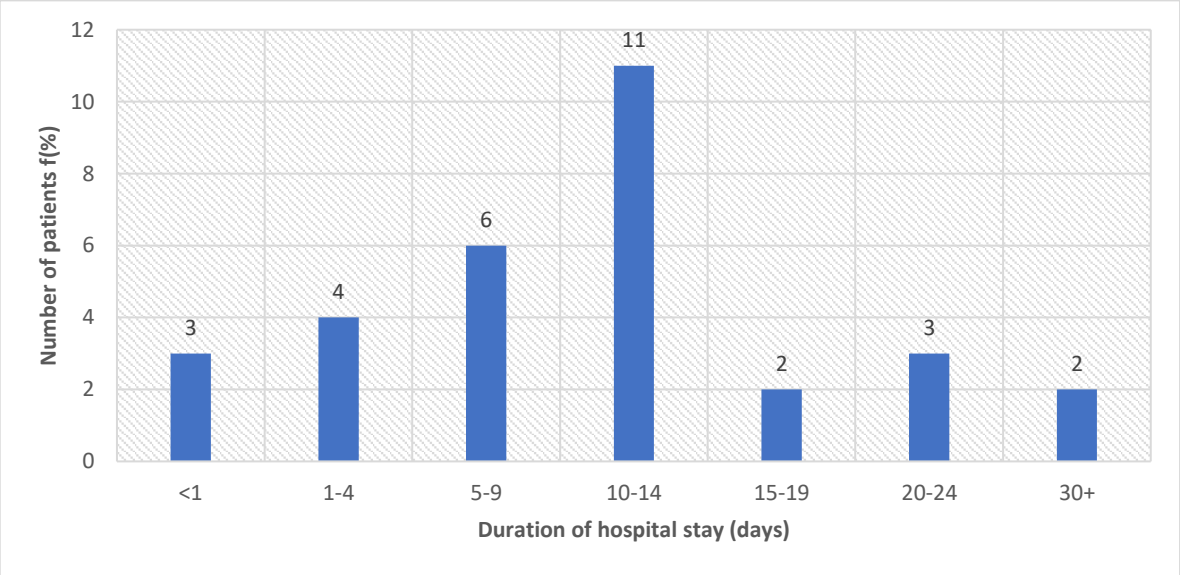

Figure 6: Bar-chart showing duration of hospital stay

Figure 7 shows that the majority of patients were discharged (24; 77.4%), while 5 patients (16.1%) died, and 2 (6.5%) were still receiving treatment at the time of data collection.

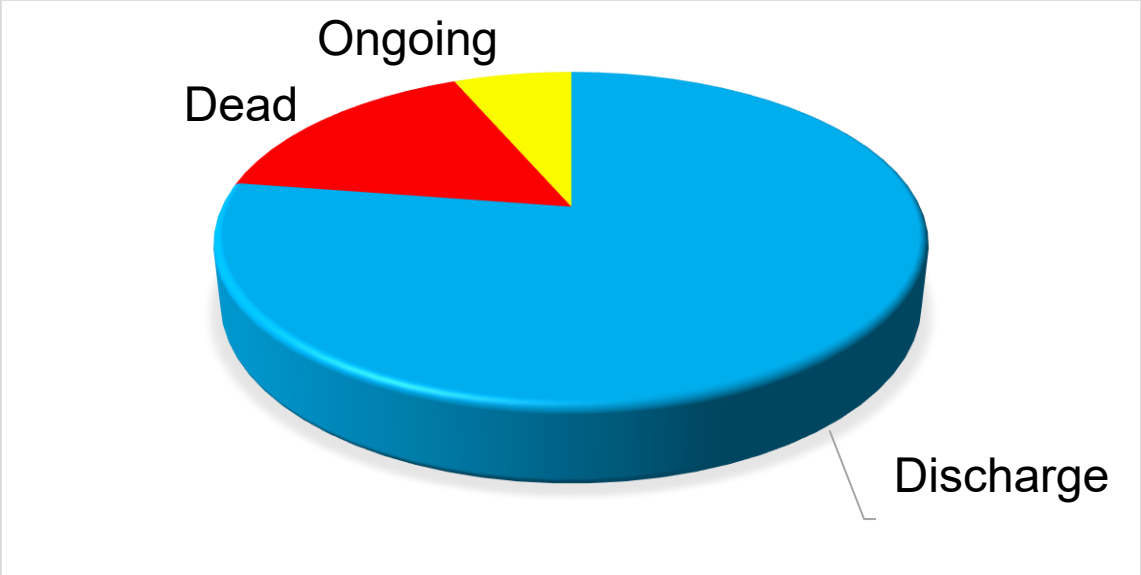

Figure 7: Pie-chart showing outcome of treatment

There was no significant association between mechanism of injury and treatment outcome ($\chi^2 = 0.936$, $p = 0.999$), despite the predominance of gunshot injuries.

Table 7: Treatment outcome and mechanism of injury

Mechanism of injury	Outcome of treatment				χ^2	p-value
	Discharge	Dead	Ongoing	Total		
Machete	2(100.0)	0(0.0)	0(0.0)	2(100.0)		
Gunshot	22(75.9)	5(17.2)	2(6.9)	29(100.)		
Total	24(77.4)	5(16.1)	2(6.5)	31(100.)	0.936	0.999

No statistically significant association was found between triage category and treatment outcome ($\chi^2 = 5.172$, $p = 0.205$), although patients in the green category had better outcomes.

Table 8: Triage category and treatment outcome

Triage category	Outcome of treatment				χ^2	p-value
	Discharge	Dead	Ongoing	Total		
Red	9(60.0)	4(26.7)	2(13.3)	15(100.0)		
Yellow	5(83.3)	1(16.7)	0(0.0)	6(100.0)		
Green	10(100.0)	0(0.0)	0(0.0)	10(100.0)		
Total	24(77.4)	5(16.1)	2(6.5)	31(100.0)	5.172	0.205

III. DISCUSSION

A total of 70 victims were brought in over a 6hr period. For an initial 14 bed emergency unit, that was expanded to accommodate 28 resuscitating couches, this was a mass casualty situation necessitating activation of a mass casualty response plan. [13,14] As shown in FIG1, 55 of the victims were males while 15 were females showing a M: F of 11:3. Of the total 70 victims, 39 (55.7%) were brought in dead, therefore categorized as black at triage. Failure to separate this high number of death ab initio place unnecessary strain on the response team and facilities available for care. [2] The high number of death ab initio is also an indicator of the fatality of the terror attack [4,5], and probably of the negative effects of complete absent of prehospital emergency response system as most of the patients were brought in by relatives in an unprofessional manner in terms of both first aid, if any, and mode of transport as shown in FIG 5. [15,16]

The age range with the highest number of victims brought in alive was 20 to 29 years, with 19 patients, as shown in FIG 2, despite the fact that the community has a uniform spread of all age groups.

The predominant mechanism of injury is gunshot as shown in Fig. 3. Although this is in keeping with the primary cause of the incidence, of armed gun men attacking the community, this is different from previously reported conflicts in Jos and environment that is characterized by a heterogeneity of weapon of injuries. [10]

The bulk of the victims, 55.7% as shown in FIG 4, were brought in dead, mostly by relatives. This created unnecessary strain on the facility and resources especially in sorting the dead and transferring to the morgue, and relating the news to aggrieved relatives who were agitated by the attack, and the news of the demise of their love ones. Fifteen (21.4%) victims where triaged into Red category needing emergency intervention to prevent early mortality. These interventions included an emergency endotracheal intubation, a tracheostomy, four chest tube thoracostomy drainages, eleven blood transfusions and five laparotomies. These interventions helped reduce the hospital mortality to 5%, a measure of effectiveness of any mass casualty response. [4]

Majority (77.4%) of the patients had injuries to a single system as seen on Table 1. This may be because they had single shots to various parts or regions of the body. This is worthy of note as generally patients with injury to single system tend to do better than those with injuries involving multiple systems. [17] Although patients with single system injuries had better outcomes compared to polytraumatized patients, there was no statistically significant relationship between the number of systems injured and treatment outcome as shown in Table 9.

Definitive interventions were few, as majority had minor injuries, and those with severe injuries were managed during the resuscitation phase of the management. These definitive interventions included laparotomies with creation of stoma, and open reduction and internal fixation for fractures as shown in Table 5. This finding is comparable to most other mass casualty incidences. [18,19] A patient had enucleation of his right eye following trauma to that eye, with complication of permanent loss of vision on that eye.

Complications from the injuries were few and far in between, as seen on Table 6. The highest complication was that of wound infection which was expected as majority of the injuries being gunshot wounds were dirty wounds ab initio with a high infection rate. [20,21]

Average duration of hospital stay was 11.8 days, with peak (11%) staying ten to fourteen days. The longest duration of stay was in those with long bone fractures. This is similar to findings in gunshot injuries in the region. [22,23]

Five patients died in hospital while receiving treatment, given a hospital mortality of 17.2%. The deaths were from septic shock, acute kidney injury, and multiple organ dysfunction syndrome. As shown on Table 8, all the patients that died where amongst those that sustained gunshot injuries, four of whom were initially triaged into the Red (immediate) category at presentation and one into the Yellow (urgent) category. These patients still died despite the urgency of resuscitation and definitive treatment because of the severity of their injuries.

IV. CONCLUSION

The Palm Sunday attack in Ungwar Rukuba generated a mass casualty incidence with mainly gunshot injuries affecting mostly young men, single system injuries, high field mortality because of poor pre-hospital emergency response that stretched Jos University Teaching Hospital mass casualty response.

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