

Mass casualty management: Jos University Teaching Hospital experience

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Summary

Three experiences of management of mass casualties in Jos University Teaching Hospital were analysed. Classification into minor, moderate and major mass casualties was done using multiple criteria of number of casualties, number of doctors required to contain the situation, number of nurses and paramedical staff, degree of disruption of hospital services and time required to handle the immediate stabilisation of the casualties. The classification recognises a category called "regional disaster" and attempts to enunciate a principle of initiation, mobilisation and co-ordination of management of such disasters among hospitals and human and material resources within the region. It is envisaged that coalescence of "regional disaster preparedness" would form the bedrock of national ambulance services system.

Keywords: Mass casualty, Classification, Regional disaster, Emergency services, Mobilisation.

Résumé

Trois expériences de gestion de grand nombre des blessés au centre hospitalier de l'université de Jos étaient analysées. Un classement en petit, moyen et grand nombre des blessés était fait en utilisant des critères multiples du nombre des blessés, des docteurs, était fait en utilisant des critères multiples du nombre des blessés, des docteurs, vœux pour maîtriser la situation, le nombre d'infirmiers et des membres de la gestion paramédicale, le niveau de brisement des services hospitaliers et le temps exigé pour manipuler la stabilisation immédiate des blessés. Le classement reconnu une catégorie nommée "Disastre régional" et essaie d'articuler un principe d'initiation, mobilisation, et co-ordination de gestion de tels désastres dans les hôpitaux et parmi les ressources humaines et matérielles dans la région. C'est prévu que l'état d'alerte préventive d'une fusion de désastre régional serait le fondement d'un système des services.

Introduction

Mass casualty management presents multi-dimensional challenges that call for a multi-disciplinary approach in order to cope with the situation^{1,4}. However, attempts at classification of mass casualty have failed to take cognisance of its various aspects. The term mass casualty refers to large numbers of injured patients presenting simultaneously to an accident and emergency unit of a given health institution³. A disaster on the other hand refers to the event that generates such a mass casualty^{2,3,5}. Both terms are used interchangeably for practical purposes.

Steven⁵ defined mass disaster as an event in which 10 or more people are killed, while Caro reported that the police defined major disaster as one producing 50 casualties^{1,6}. The

American College of Surgeons states that a major disaster is a sudden event with a variable mixture of injury to human beings, destruction of property, overwhelming of local response resources and disruption of organised societal mechanism^{1,2,3,4}.

Military medicare went further to classify mass casualty into minor when 10 – 99 casualties are involved; moderate if 100 – 999 casualties and major when 1000 casualties or more are involved².

These various classifications and definitions seek to identify a given problem in order to define a producible way of responding to the various ramifications in different settings. Other classifications relate to aetiology, emergency preparedness, location, etc. The peculiar capabilities, resources and potentials of any institution, community or set up bear on the definition or classification of mass casualty^{1,2,3}. Consequently, Jos University Teaching hospital defined mass casualty as the simultaneous arrival of seven or more casualties requiring resuscitation to its Accident and Emergency (A&E) unit (Jos protocol)1-3. Following experiences in managing mass casualty on three occasions, a classification based on the principle of Jos protocol to improve emergency preparedness integrate all aspects of the hospital and anticipate a co-ordination role in event of a regional disaster in Plateau State. The classification *vide infra* is believed to be practically applicable to any developing country that lacks ambulance service system. The individual disasters that were analysed are presented as case reports while the polycriteria classification and regional disaster preparedness is presented as a Jos case study.

Patients and methods

A retrospective audit of three incidences of mass casualty managed in Jos University Teaching Hospital (JUTH) was undertaken. The data was culled from the casualty records, the reports given to management, and the nurses admission and discharge registers. The information was analysed for number of casualties, mortality, severity of injury, requisite staff for the management and time taken to contain the situation and for services to return to normal. The principle of management followed Jos protocol¹ – a laid down routine for managing mass casualty in JUTH. Problems encountered in the management were utilised to attempt a multicriteria classification of mass casualty with the introduction of a concept of regional disaster preparedness^{1,3,7}.

Case reports

Case 1 (Barkin ladi vehicular collision)

On 6th April 1967, a minibus conveying traders to a neighbouring market, collided with a Peugeot J5 carrier at Barkin Ladi; a town 50km from Jos. Five persons were said to have died on the spot. Eye witnesses and the police set out to rush the remaining 29 casualties to Jos University Teaching Hospital

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Table 1 Summary of data for the 3 mass casualties managed in Jos University Teaching Hospital

| Parameter | Barkin-Ladi Vehicular Collison | Fuskan-mata Vehicular fall | Saminaka Vehicular Collison |
|--|--------------------------------|----------------------------|-----------------------------|
| 1 Date | 6/4/97 | 27/3/98 | 7/7/98 |
| 2 Number of casualties | 29 | 22 | 14 |
| 3 Number of deaths | 6 | Nil | 1 |
| 4 Severely injured patients | 23 | 6 | 9 |
| 5 Polytraumatised patients | 15 | 3 | 5 |
| 6 Number of doctors involved in the immediate management | 15 | 8 | 6 |
| 7 Number of Nursing Staff required to handle immediate management i.e nurses and auxillaries | 50 | 15 | 18 |
| 8 Time taken to stabilise the patients | 5 hours | 2 hours | 6 hours |
| 9 Degree of hospital disruption i.e. time taken for normal hospital services to return. | 7.5 hours | 3 hours | 8 hours |

at 10a.m that Sunday morning (45 minutes after occurrence). A summary of the injuries and human resources utilised in their immediate management is as shown in Table 1.

Case 2 (Fuskan-mata vehicular fall)

On 27th March, 1998, a Mercedes Benz truck conveying passengers from Yelwa Shendam to Kano lost control and fell at Fuskan-mata. Twenty-two casualties from the incidence were again brought to the A & E Unit of Jos University Teaching Hospital at 10pm. The management again followed the principles of Jos protocol and the relevant data is summarised in Table 1.

Case 3 (Saminaka vehicular collison)

On the 7th July, 1998, a Hiace bus conveying passengers from Jos to Kano collided with a tractor turning at the middle of the road at Saminaka. Fourteen injured patients were brought to JUTH at night, the relevant data concerning their management are again summarised in Table 1.

Polycriteria classification of mass casualty

Background

Jos University Teaching Hospital is a major tertiary referral centre located in the middle belt of Nigeria. The coverage area includes most parts of the middle belt and the far north of Nigeria with a trickle of patients who for reasons of preference come from the south of Nigeria. The estimated coverage population is about 30 million people.

Classification

Mass casualty in Jos University Teaching Hospital is classified into minor, moderate and major. The criteria used in the delineation include the following:

- Number of casualties
- Number of doctors required for immediate management

- Number of nursing staff
 - Time taken for immediate stabilisation
 - Degree of disruption of hospital services, assessed by the time required for hospital services to return to normal.
- Major mass casualty is regarded by this classification as a regional disaster.

Discussion

Jos protocol provides that in event of mass casualty, the casualty lying-in ward and a designated surgical ward will be evacuated of patients to other wards. These two wards are expected to take in a maximum of 30 patients, placed either on mattresses on the floor or on the couches as the situation demands. It is therefore envisaged that the hospital can accommodate 30 casualties without much problem. Hence 7 to 30 casualties are assigned to minor mass casualty. Between 31 and 50 casualties constitute moderate mass casualty, because with this number of casualty, the hospital will begin to experience serious accommodation problem. At the upper limit of this moderate number of mass casualty, there will begin to arise a need to send some patients to other hospitals. When the casualties are more than 50, it is said to be major. This figure will be meaningful when viewed at the background of the number of emergencies ordinarily attended to by the A & E unit. This classification recognises that in the event of more than 50 casualties peripheral hospitals within the region will need to take in some of the patients; hence a major mass casualty is regarded as a regional disaster.

The number of doctors required for the immediate management was worked out taking cognisance of the areas of distribution of the patients within the hospital. The mass casualty commander with an assistant will be stationed at the casualty theatre and casualty theatre anterooms. Six doctors will be stationed at the receptacle wards as follows: 2 at the casualty lying-in ward, and 4 at the surgical wards evacuated for this purpose. A doctor each is expected to supervise the evacuated patients and coordinate the various activity zones. And a doctor is expected to

take charge of mobilisation of material resources and further call-up. Therefore, from the above, 15 doctors or less are expected to contain a minor mass casualty.

The number of the nurses tallies with that of the doctors because each doctor is expected to work with a nurse. The nursing assistants/porters will be required for the transfer of patients and materials to and from the wards, theatre and laboratories. The numbers assigned took cognisance of the various areas of activities within the hospital.

Conclusion

This classification, seeks to circumvent the problem of lack of ambulance services system in our country. It further proposes a hospital based initiative for the management of mass casualty in our environment.

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