

## The Conundrum of Polytrauma in Sokoto, North-West Nigeria

Oboirien M\*, Ukwuani S and Agbo SP

\*Department of Orthopaedics and Trauma, Trauma Centre, Usmanu Danfodiyo University Teaching Hospital, Nigeria

### Abstract

**Introduction:** The Management of Polytrauma remains a challenge in regions of sub-Saharan Africa. We sought to document our experiences with Polytrauma management in a resource poor setting.

**Methods:** It was a retrospective review of cases of Polytrauma managed at a regional trauma centre in North-west Nigeria from January 2014 to December 2014. Trauma records of patients were retrieved and collated. Statistical analysis was done with SPSS 21.

**Results:** A total of 84 patients were seen with a mean age of  $29.34 \pm 14.82$ . There were 78 males and 6 females giving a male to female ratio of 13:1. Road traffic accidents were the commonest mechanism in 66 (78.6%) patients while assault 6 (7.1%), fall from height 6 (7.1%), collapsed building 4 (4.8%) were observed. Forty-two percent of patients arrived at our facility 24 hrs after the trauma while 10.7% arrived within an hour and 28.6% arrived after 6 hours. Head and extremity injuries were the commonly encountered with 71% and 65% respectively. The common injury combination observed were head\extremity 39%, head\facial 27.4%, head\extremity\facial 27.4%, and head\chest 11.9%. Mortality was 9.5% and those with major and minor disability were 9.5% and 7.1% respectively. Duration of more than 1 hour of arrival at facility was statistically significant on mortality, while age, mechanism of injury, distance from health facility was not statistically significant on mortality.

**Conclusion:** Measures aimed at improving road safety would help to reduce the incidence of Polytrauma. Efficient Pre-hospital care would ensure prompt arrival at designated health facilities.

**Keywords:** Polytrauma; Head injury; Management

### Introduction

Polytrauma refers to significant injuries involving more than one system or several sites in a given system. Injuries involving several systems of the body have a tremendous impact on management especially if such injuries are severe. Some of these injuries may be missed during the initial triage and assessment. Stabilisation at the injury site before transfer to hospital improve outcome in these patients. In addition, the introduction of training and education programmes such as Pre-hospital trauma life support (PHTLS), advanced trauma life support (ATLS) concept has increased the quality of treatment of most severely injured trauma patients both in the preclinical field and in the emergency trauma room [1]. The introduction of Damage control surgical principles in the management of Polytrauma has also improved the outcome of severely injured patients [2]. The implementation of trauma networks, the release of polytrauma guidelines, in some developed countries have contributed to a more structured management of most severely injured and polytrauma patients [2,3]. Management of polytrauma requires a high index of suspicion and also sophisticated imaging equipment. Deaths from polytrauma results from neurotrauma especially in adolescents, haemorrhage and severe chest injury [4,5]. The management of polytrauma remains a challenge in regions of sub-Saharan Africa because of the lack of effective pre-hospital care and proper referral system. We sought to document our experiences with Polytrauma management in a resource poor setting.

### Methods

It was a retrospective review of cases of Polytrauma managed at a regional trauma centre in North-West Nigeria from January 2014 to December 2014. Trauma records were retrieved and collated from the admission records and case folders of all trauma victims. Those that met the criteria of the definition of Polytrauma were included. The centre is unclassified and has no formal trauma registry. Parameters included

the demographics, location and distance of injury to the trauma centre. Other variables studied were the pattern of injuries and the outcome. Statistical analysis was done with SPSS 21 and results presented in tables and graph. Level of significance was  $<0.05$ .

### Results

A total of 84 patients were seen over a period of one year with a mean age of  $29.34 \pm 14.82$  as in Table 1. There were 78 males and 6 females giving a male to female ratio of 13:1 (Figure 1). Road traffic accidents was the commonest cause of Polytrauma in 66 (78.6%) patients while assault 6 (7.1%), fall from height 6 (7.1%), collapsed building 4 (4.8%) were the other causes respectively (Table 2). Sixty-six percent of patients had their trauma at locations of more than 50 km to the centre (Table 3). Forty-two percent of patients arrived at the facility 24 hrs after the trauma while 10.7% arrived within an hour and 28.6% arrived after 6 hours (Table 4). Head and extremity injuries were the commonly encountered with 71% and 65% respectively (Table 5). The common injury combination observed were head\extremity 39%, head\facial 27.4%, head\extremity\facial 27.4%, and head\chest 11.9% (Table 6). Mortality was 9.5% and those with major and minor disability were 9.5% and 7.1% respectively (Figure 2). Duration of more than 1 hour of arrival at facility was statistically significant on mortality, while age, mechanism of injury, distance from health facility was not statistically significant on mortality (Table 7).

**\*Corresponding author:** Muhammad Oboirien, Department of Orthopaedics and Trauma, Trauma Centre, Usmanu Danfodiyo University Teaching Hospital, Nigeria, Tel: 2348050381688; E-mail: [moboirien@yahoo.com](mailto:moboirien@yahoo.com)

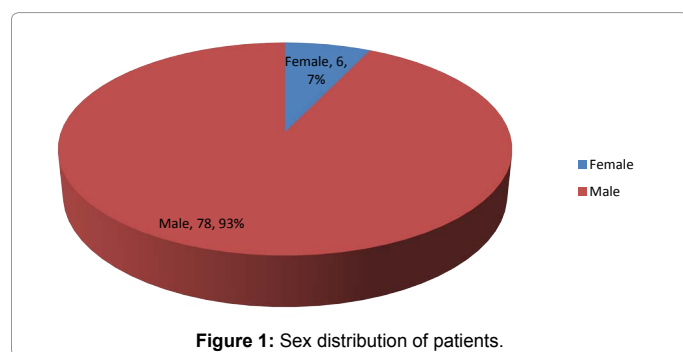
**Received** March 21, 2016; **Accepted** April 11, 2016; **Published** April 14, 2016

**Citation:** Oboirien M, Ukwuani S, Agbo SP (2016) The Conundrum of Polytrauma in Sokoto, North-West Nigeria. J Trauma Treat 5: 301. doi:10.4172/2167-1222.1000301

**Copyright:** © 2016 Oboirien M, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Age group	SEX		Total
	Male	Female	
0-15	15	1	16
16-45	50	4	54
46 and above	13	1	14
TOTAL	78	6	84

**Table 1:** Age classification of victims



Mechanism of trauma	Frequency	percentages
Road traffic accident		
Vehicle head on collision	11	13.1
Pedestrian knock down by vehicle	13	15.5
Lone vehicle crash	15	17.9
Motor bike crash	27	32.1
Assault	6	7.1
Collapsed building	4	4.8
Fall from a height	6	7.1
Electric shock (High voltage)	2	2.4
Total	84	100

**Table 2:** Causes of Polytrauma.

Place of Trauma	Frequency	Percent
Sokoto city	14	16.7
Within 50 km of the trauma centre	15	17.9
Beyond 50 km of the trauma centre	55	65.5
Total	84	100

**Table 3:** Location of site of trauma to facility.

Duration before arrival at health facility	Frequency	Percentage
With in an hour	9	10.7
1-6 hours	24	28.6
7-24 hours	16	19
Greater than 24 hour	35	41.7
Total	84	100

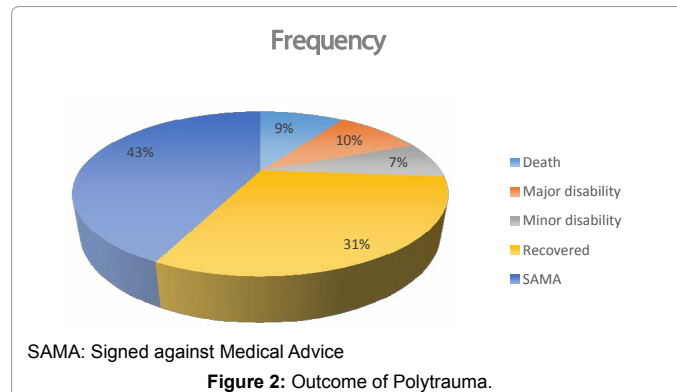
**Table 4:** Time to arrival at facility.

Pattern of Injuries	Frequency	Percentage
Head injuries	60	71.42
Spinal cord injuries	11	13.09
Chest injuries	10	11.90
Abdominal trauma	1	1.19
Genitourinary	2	2.38
Extremity injuries	55	65.48
Facial injuries	31	36.90
Others	4	4.76

**Table 5:** Pattern of injuries.

Injury combinations	Frequency	Percentage
Head and chest injuries	10.0	11.9
Head and extremities injuries	33.0	39.3
Head and facial injuries	23.0	27.4
Extremities and spinal cord injuries	2.0	2.4
Head, extremities and facial injuries	23.0	27.4

**Table 6:** Injury combination.



Death	Non death outcome	Total
2.0	14.0	16.0
6.0	26.0	32.0
8.0	40.0	48.0
8.0	40.0	48.0

P>0.05 (0.584) df=2 (excluding those that SAMA-36)

Within 1 hour	0	14.0	
Greater than 1hour	8.0	26.0	
Total	8.0	40.0	

P<0.05 (0.047), df=2(excluding those that SAMA-36)

Distance from heath facility			
Sokoto	2.0	7.0	9.0
Within 50 km	0.0	6.0	6.0
Beyond 50 km	6.0	27.0	33.0
Total	8.0	40.0	48.0

P> 0.05, df=2, (p=0.483) (excluding those that SAMA-36)

Age group			
0-15	2.0	10.0	12.0
16-45	6.0	20.0	26.0
Above 45	0.0	10.0	10.0
Total	8.0	40.0	48.0

p>0.05, df=2 (p=0.25) (excluding those that SAMA-36)

Mechanism of trauma			
RTA	4.0	30.0	34.0
NON RTA	4.0	10.0	14.0
Total	8.0	40.0	48.0

P>0.05 (p=0.156) (excluding those that SAMA-36)

**Table 7:** Correlation between age, duration of arrival, mechanism with mortality.

## Discussion

Trauma remains the commonest cause of death in people under the age of 44 years worldwide. Our study showed the vulnerability of those under the age of 45 years and also the male sex preponderance. This is in keeping with other studies of trauma in our region and globally. Economic and social activities often involve young male individuals who are mainly breadwinners [2,5]. Road traffic accident was a major mechanism of injury in Polytrauma in our study as most other studies have

shown. In Jos, North-central Nigeria, Road traffic accident constituted 86.7% of the causes of Polytrauma. Motor bike crash, lone vehicular crashes and paediatric accidents are forms of crashes seen in our sub region. The motorcycle is employed as means of public transportation in our sub region and there is little or no regard for safety measures. The riders are not trained and injuries from motorcycle-motorcycle collision or motorcycle-car collision abounds. Injuries amongst victims of motorcycle accidents varies and occasionally severe as a result of lack of use of protective helmet and the carelessness on the part of the riders. In a review of trauma incidence in Sokoto in 2009, Motorcycle accidents was found to be the commonest mechanism of trauma with 39.7% [6]. It was also the commonest cause of Polytrauma in Sokoto from our study. Assault and fall from height were also mechanism of Polytrauma in our study. Cases of assault may arise from interpersonal squabbles, cattle rustling, and armed robbery attacks while building collapsed was also a cause of Polytrauma. The location of the place of trauma affects how early the patients are brought to the Centre. Delays arise from the fact that there is no functioning rescue system coupled with poor communication. Patients that finally made it to the centre would have been improperly assessed or are in a state of shock from haemorrhage. The prognosis is made worst when they present as part of a mass casualty scenario as life threatening injuries could be missed. The pattern of injury has been consistent with previous work on trauma incidence and mechanism [6-9]. Head and extremity injuries were the common injuries encountered. Motorcycle accidents and motor vehicular accidents were the commonest mechanism and victims of these accidents are vulnerable to head and extremity injuries because of lack of use protective helmet, overloading and reckless driving habits. A German study found that head injuries was common in victims of bicycle injuries, extremity injuries in victims of motorcycle accidents while chest and pelvic injury was common in victims of car accidents [10]. Neurotrauma remains a problem in managing Polytrauma patients in our sub region. It is major cause of paediatric and adolescent deaths in Benin, South-South Nigeria [5,11,12]. Most centres in our sub region lack sophisticated diagnostic tools like computerised tomography scan and specialist to manage the complexity of Polytrauma. Most patients cannot afford these services when available with resulting delays in trying to get waivers. It was noted that a high percentage of patients left against medical advice despite the nature of some of the injuries. Some of the reasons have to do with the acceptability of orthodox care for fractures. Patronage of traditional bone setters in our environment cuts across socio-economic and educational status. It is not uncommon to see patients recovering from mild to moderate head injury being taken away for traditional bone setters' care [13]. The low fatality rate does not include the fate of those that left against medical advice. The most important determinant of mortality in our study was the duration before arrival at the facility. It was statistically significant for duration

of more than one hour. Delay in rescue and inappropriate extrication as a result of a lack of a functional pre-hospital care results in victims dying from largely preventable and avoidable deaths. Various workers have identified head injuries, multiple injuries as causes of death in Polytrauma. Delay in presentation can result in brain hypoxia, acidosis, irreversible shock and death [14].

## Conclusion

Measures aimed at improving road safety would help to reduce the incidence of Polytrauma. Efficient Pre-hospital care would ensure prompt arrival at designated health facilities.

## References

1. Yunus M, Karim HM, Hajong R, Singh VS (2015) Polytrauma patient with through and through penetrating rod in abdomen: Timing and team utmost importance in emergency. *J Emerg Trauma Shock* 8: 176-177.
2. El Mestoui Z, Jalalzadeh H, Giannakopoulos GF, Zuidema WP (2015) Incidence and etiology of mortality in polytrauma patients in a Dutch level 1 trauma center. *Eur J Emerg Med*.
3. Hussmann B, Lendemann S (2014) Pre-hospital and early in-hospital management of severe injuries: Changes and trends. *Injury* 3: S39-42.
4. Ozoilo KN, Nwadiaro KC, Iya D, Sule AZ (2012) The Conundrum of polytrauma on the Jos plateau. *West Afr J Med* 31: 52-57
5. Osifo OD, Iribhogbe PE, Ugiagbe EE (2012) Epidemiology and pattern of paediatric and adolescent trauma deaths in a level 1 trauma centre in Benin city, Nigeria. *Injury* 43:1861-1864.
6. Oboirien M, Ismail S, Agbo PS (2011) Trauma incidence in Sokoto, North-west Nigeria. *Nig. J Ortho & Trauma* 10: 105-109.
7. Enweluzo GO, Giwa SO, Obalum DC (2008) Pattern of extremity injuries in polytrauma in Lagos, Nigeria. *Niger Postgrad Med J* 15: 6-9.
8. Thanni LO, Kehinde OA (2006) Trauma at a Nigerian teaching hospital: pattern and documentation of presentation. *Afr Health Sci* 6: 104-107.
9. Elachi IC, Yongu WT, Odoyoh OO, Mue DD, Ogwuche EI, et al. (2015) An epidemiological study of the burden of trauma in Makurdi, Nigeria. *Int J Crit Illn Inj Sci* 5: 99-102.
10. Wick M, Ekkernkamp A, Muhr G (1997) The epidemiology of multiple trauma. *Chirurg* 68: 1053.
11. Adeolu AA, Abiona TC, Komolafe EO, Adeolu JO, Adegbehingbe OO (2013). Epidemiology of neurotrauma in Ife-Ijesha zone of Nigeria. *World Neurosurg* 80: 251-254.
12. Obalum DC, Enweluzo O, Giwa SO (2008). Morbidity and mortality associated with polytrauma at a Nigerian tertiary hospital. *West Afr J Med* 27: 97-100
13. Oboirien M, Khalid A (2013). Knowledge and Belief about Traditional Bone Setters' practices in Sokoto, North-West Nigeria. *The internet journal of Orthopaedic Surgery*.
14. Solagberu BA, Adekanye AO, Ofoegbu CP, Udoffa US, Abdur-Rahman LO, et al. (2003) Epidemiology of trauma deaths. *West Afr J Med* 22:177-181.