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ORIGINAL ARTICLE

Incidence of Polytrauma in the Casualty Emergency Department of a Tertiary Care Hospital in Dhaka city

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Abstract

Background: Polytrauma is a public health problem in every country. **Objective:** The purpose of the present study was to assess the incidence of Polytrauma in the Casualty Emergency Department of a tertiary care hospital in Dhaka city. **Methodology:** This cross-sectional study was carried out in the casualty of Emergency Department of Dhaka Medical College Hospital, Dhaka, Bangladesh. The patients who were admitted from January 2014 to December 2014 were included in this study. This study includes all the patients with polytrauma, most of whom underwent laparotomy or other types of surgery like suprapubic cystostomy, amputation, surgical toileting, chest drainage, but a small number was managed with non-operative approach. Immediately after admission, the patients were subjected to resuscitation, primary survey and history taking including pre-hospital retrieval. A tabulated sheet of questionnaire was given to all the patients and answer was taken by conversation and examination. **Results:** A total number of 100 patients were recruited for this study. The mean age with SD of the study population was 33.5±12.5 with the range of 3 to 67 years. The male female ratio is 7.33:1. The victims of polytrauma sustained their injury from different kinds of trauma. Out of hundred cases with polytrauma, road traffic accidents was the most common cause which included motor vehicle accident, pedestrian and motor cycle accident and resulted in a total of 63 casualty occupying 63% of the entire series. Polytrauma resulted fall from height occurred in 10 (10%) cases. Stab injury caused polytrauma in 5 (5%) cases. **Conclusion:** In conclusion majority of the study population is young adult with the predominance of male presented with road traffic accident. [*Journal of Current and Advance Medical Research, July 2023;10(2):60-64*]

Keywords: Incidence; polytrauma; casualty; emergency department; tertiary care hospital

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Introduction

Trauma involving more than two body systems or two body systems and one orthopedic trauma is said to be polytrauma[1]. Pelvic injury itself is a polytrauma as there is usually associated urethral or bladder injury[2]. Polytrauma is a public health problem in every country regardless of the level of socioeconomic development[3]. Worldwide there is increase in polytrauma patients. The number of death after trauma will increase from 5.1 million to 8.4 million[4]. The reason is the technical progress in third world. In western countries there was a decrease in trauma death, in Germany below 8.000 due to traffic accident[5].

In United States, trauma is the leading cause of death in children and adults up to 44 years and kill more Americans of age 1 to 34 years than all diseased combined[6]. In Germany two third of road casualties aged less than 45 years[7]. In USA male are more susceptible to polytrauma than female but the ratio is very marginal and the male and female ratio in USA is 1.16:1.26[8]. In Germany 70.0% case of polytrauma is RTA, 14.0% assaults, 7.0% fall from height and other causes are 9.0% cases[7]. Both in Germany and Bangladesh the main causes are same but the ratio indicates different picture.

In German, polytraumatized patients experienced thorax injury (68.9% of patients), abdominal injury 37% of patients, pelvic injury 49.4% of patients and injury to limbs (83.6% of patients)[9]. The mortality rate of post polytraumatized MODS. in Germany is 37.5% cases[10]. In USA and Germany all the polytraumatized patients are treated in one center, as the availability of multi disciplinary surgeons in the same center[11].

In Dhaka Medical College Hospital casualty department, the most common cause of morbidity and mortality is polytrauma. Dhaka Medical College Hospital casualty department is the busiest functioning casualty unit in Bangladesh. Patients come from all over Bangladesh. Very often the patients come after the Golden hour[3] of polytrauma. On that occasion it is very difficult to manage them.

With limited facilities Dhaka Medical College Hospital casualty department is offering its services. The purpose of the present study was to assess the incidence of Polytrauma in the Casualty Emergency Department of a tertiary care hospital in Dhaka city.

Methodology

Study Settings and Population: This study was a prospective type of study. This study was carried out in the casualty department of Dhaka Medical College Hospital, Dhaka, Bangladesh. The patients who were admitted from January 2014 to December 2014 were included in this study. This study includes all the patients with polytrauma, most of whom underwent laparotomy or other types of surgery like suprapubic cystostomy, amputation, surgical toileting, chest drainage, but a small number was managed with non-operative approach.

Study Procedure: Immediately after admission, the patients were subjected to resuscitation, primary survey and history taking including pre-hospital retrieval. A tabulated sheet of questionnaire was given to all the patients and answer was taken by conversation and examination. Secondary survey was done after resuscitation. As most of the patients were admitted with shock, all routine investigations were not done because of lack of urgent laboratory facilities. But relevant investigations were done and recorded. The preoperative management given to the patients was recorded and as well as detailed operative techniques and findings were also recorded. A careful record of hospital stay, the postoperative events and their management and mortality rate also noted. After getting all the information, results were analyzed by manual method.

Statistical Analysis: Statistical analysis was performed by Windows based software named as Statistical Package for Social Science (SPSS), versions 22.0 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). Continuous data were expressed as mean, standard deviation, minimum and maximum. Categorical data were summarized in terms of frequency counts and percentages. Chi-square test was used for comparison of categorical variables and Student t test was applied for continuous variables. Every effort was made to obtain missing data. A two-sided P value of less than 0.05 was considered to indicate statistical significance. Differences between case and control were tested.

Ethical Clearance: All procedures of the present study were carried out in accordance with the principles for human investigations (i.e., Helsinki Declaration) and also with the ethical guidelines of the Institutional research ethics. Formal ethics approval was granted by the local ethics committee. Participants in the study were informed about the procedure and purpose of the study and confidentiality of information provided. All participants consented willingly to be a part of the study during the data collection periods. All data were collected anonymously and were analyzed using the coding system.

Results

A total number of 100 patients were recruited for this study. The age of the patients in this study ranged from 8 years to 56 years. The majority (45%) fall in the age group between 21 years and 30 years. Next comes the age group between 11 years and 20 years (23%). About 20% patients were in the age group between 31 years and 40 years. 7% were in the age group between 41 years and 50 years. 2% patients were at or below 10 years of age 3% patients were more than 51 years of age. The mean age with SD of the study population was 33.5±12.5 with the range of 3 to 67 years (Table 1).

Table 1: Age Distribution of the Patients (n = 100)

Age Group	Frequency	Percent
Less Than 20 Years	25	25.0
21 to 50 Years	65	65.0
More Than 50 Years	10	10.0
Total	**100**	**100.0**
Mean±SD (Range)	**33.5±12.5 (3 to 67)**	

Out of 100 patients, total male patients sustained polytrauma were 88% ranging from 8 years to 56 years. Total female patients sustained the polytrauma were only 12% ranging from 18 years to 48 years of age. The male female ratio is 7.33:1 (Figure I).

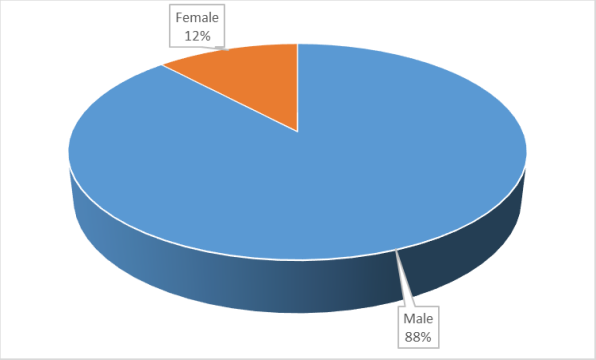

Figure I: Showing the distribution of gender

The victims of polytrauma sustained their injury from different kinds of trauma. Out of hundred cases with polytrauma, road traffic accidents was the most common cause which included motor vehicle accident, pedestrian and motor cycle accident and resulted in a total of 63 casualty occupying 63% of the entire series. Blast injuries which include bomb blast injury, gunshot injury, caused polytrauma 20 (20%) cases. Polytrauma resulted fall from height occurred in 10 (10%) cases. Stab injury caused polytrauma in 5 (5%) cases. Remaining 2 (2%) cases were struck by storm (Table 2).

Table 2: Causes of Polytrauma (n = 100)

Causes	Frequency	Percent
Road Traffic Accident	63	63.0
Blast injury (bomb blast, gun shot)	20	20.0
Fall from height	10	10.0
Stab injury	5	5.0
Others (storm disaster)	2	2.0
Total	100	100.0

Discussion

There ensue a complex series of changes from which scarcely any tissue of the body escapes after major trauma[11]. The nervous system responds promptly with increased out-put of autonomic impulses. There is an immediate outpouring of catecholamines from the adrenal medulla, while the other endocrine glands respond more slowly; stimulation of hypothalamus leads to an increase in adrenocortical over activity[12]. These changes assist the injured persons to withstand trauma.

With the advent of industrialization, accelerated social violence, increasing road traffic accident and increasing use of machineries polytrauma has become one of the leading causes of mortality and disability[13]. Considering polytrauma, time elapsed between onset of polytrauma and arrival of patients in hospital is very important. Soon the patient comes to hospital, the rate of mortality and morbidity decrease. Most of the polytraumatized patients present with severe shock[14]. So, early shock management is very important. Organs of abdomen, chest and long bones are mostly affected in polytraumatized patients[7]. Delay hospital retrieval and delay onset is a major contributor to morbidity and mortality.

General objective of this study was the cause of polytrauma presented in casualty department of Dhaka Medical Collage Hospital. A number of causes were detected in this study. We compared the causes of polytrauma in Bangladesh with the causes of polytrauma in developed country. Road traffic accident and social violence is the main to causes of polytrauma in Bangladesh[11]. These are the main causes in developed country also. In this study we also give some recommendation regarding polytrauma. So that the incidence of polytrauma can be reduce.

The age of the patients in this study ranged from 8 years to 56 years. The majority (45%) fall in the age group between 21 years and 30 years. Next comes the age group between 11 years and 20 years (23%). 20% patients were in the age group between 31 years and 40 years. 7% were in the age group between 41 years and 50 years. 2% patients were at or below 10 years of age 3% patients were more than 51 years of age. In United States, trauma is the leading cause of death in children and adults up to 44 years and kill more Americans of age 1-34 years than all diseased combined[2]. In Germany two third of road casualties aged less than 45 years[12].

The majority of patients were of the active phase of life, they were responsible for running their families

by their earnings and as such subjected more to the various traumatic agents in their daily life both on the road and in the working place as well. The total male patient's sustained polytrauma in this study were 88 (88%) and only 12 (12%) patients were female. So the male and female ratio was 7.33:1. This figure shows male sex predilection possibly because of the exposure of the male to external environment more frequently. In USA male are more susceptible to polytrauma than female but the ratio is very marginal. The male and female ratio in USA is 1.16:1[14].

The victims of polytrauma sustained their injury from different kinds of trauma. Out of hundred cases with polytrauma, road traffic accidents were the most common cause which included motor vehicle accident, pedestrian and motor cycle accident and resulted in a total of 63 casualty occupying 63.0% of the entire series. Blast injuries which include bomb blast injury, gunshot injury, caused polytrauma 20(20.0%) cases. Polytrauma resulted, fall from height occurred in 10(10%) cases. Stab injury caused polytrauma in 5(5%) cases. Remaining 2(2.0%) cases were struck by storm. In Germany 70.0% case of polytrauma is RTA, 14.0% assaults, 7.0% fall from height and other causes are 9.0%. Both in Germany and Bangladesh the main causes is same but the ratio indicates different picture[15]. In our study RTA was the major cause (63.0%) of polytrauma. There are so many causes of RTA in our country such as poor traffic control, defective motor vehicles, inexperienced drivers, defying the traffic rules and regulations both by the pedestrians and vehicle drivers etc. Inter personal clash, social instability, political collision contributes the assault as the cause of polytrauma and in our study this accounted for 25% of cases.

Conclusion

In conclusion most of the study population are in the young adults. Male is predominant than female. The most common cause of incidence is road traffic accidents. This is the only study in a single tertiary care hospital in Dhaka city. Therefore, to get the real scenario, a large scale multicenter study is needed.

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None

Conflict of Interest
The authors declare no conflicts of interest.

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Data Availability
Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate
Ethical approval for the study was obtained from the Institutional Review Board. As this was a retrospective study the written informed consent was not obtained from all study participants. All methods were performed in accordance with the relevant guidelines and regulations.

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