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RESEARCH ARTICLE

A PROSPECTIVE DESCRIPTIVE STUDY OF TRAUMA REGISTRY IN NETAJI SUBHASH CHANDRA BOSE MEDICAL COLLEGE, JABALPUR

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Abstract

Background: Trauma registries are databases of information regarding patients who have been came and treated in hospital for injuries caused by trauma.

Aim: The objectives of this study to collect data related to trauma registry presenting to our center, as well as to analyze the demographic characteristics and other relevant data of patients admitted in our center.

Methods: A Prospective descriptive demographic study was conducted in Tertiary care center Netaji Subhash Chandra Bose Medical College and Hospital Jabalpur from 1st January 2020 to 30th June 2021. In our study included patients who present at our center with history of recent Orthopaedic trauma and sustained fracture within 48 hours. In our study excluded isolated head injuries. The data collected was analyzed.

Results: Out of 10241 patients, 7271(71%) were male and 2970(29%) were female with 2253(22%) in the 21-30 age group. Road traffic accident was the major cause of trauma (56%)followed by fall and slips (22%) and assaults(18%).The majority of these patients were brought by their family members (68%).Close to half of patients had upper extremity injury (48%) followed by lower extremity injury (45%) followed by Spinal injury (4%) and Pelvis injury(3%).

Conclusion: Trauma registry is complex database of demographic, injuries and outcomes of trauma patients. This study can help to decreasing the burden of trauma and improve health system.

Introduction:-

Trauma is a significant global challenge more so because it is the leading explanation for morbidity and mortality in young population[1]. Many factors have resulted within the rise of this problem, chief amongst them being urbanization, motorization, industrialization and alter within the socioeconomic values. Road traffic accidents (RTAs) represent a significant warning to human lives and have become the number one public hazard worldwide[2,3].

Countries are passing through significant urbanization, motorization, industrialization and a change within the socioeconomic values. India is not any different to the present change. Because of these changes, road traffic accidents (RTAs) became the first public hazard within the world, which ends in one in every of the biggest threat against human lives and safety[3]. Injury is now a number one reason behind mortality and morbidity worldwide. Injuries on roads, at home and in work place have increased because of lack of safety-related policies and programs. Annually 3,00,000 people die of RTA and more than 8 million people suffer injuries. India is that the leading

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country within the number of deaths due to RTA[4]. In 2019, 1,81,113 people died of RTA in India[5]. In 2020, when the whole world was experiencing CORONA Pandemic and the lockdown conditions, 1,33,201 people died of RTA in India alone[6].

A trauma registry is a comprehensive databases repository regarding injured patients. A trauma registry include comprehensive information associated with injury, which is usually unavailable in general hospital admission or emergency department data collections; therefore, a trauma registry aids not only injury research but also the event and evaluation of an injury prevention program and also the creation of clinical guidelines. Because a trauma registry is usually established during a hospital, it can also be used to monitor the hospital's trauma care performance[7].

Trauma registries are databases designed to document the acute phase of medical care delivered to sufferer of trauma. Patients are included within the database consistent with specific inclusion criteria, usually supported on a definition using the International Classification of Diseases (ICD). Trauma registries generally incorporate information on patient demographics, the circumstances surrounding injury, pre-hospital care and transport, emergency department and in-hospital interventions received, anatomic injury interpretation, physiological measurements, complications, outcomes and patient destinations. They also increasingly include information on pre-existing diseases, recognized as a very important determinant of outcome, independent of age and injury severity [8, 9,10].

The first computer-based trauma registry was developed in 1969 at Cook County Hospital in Chicago[11, 12]. Within the following years, numerous registries are created, all defined as a "systematic collection of clearly defined set of health and demographic data for patients with particular health characteristics, held in an exceedingly central database for a predefined purpose[13]. All registries serve one primary function: to assess and improve patient care. Additionally, registries are used for several secondary gains, for instance, to inform injury prevention initiatives, help within the design of latest trauma programs and help investigators understand the medical, economic and social impacts of trauma[12]. Recently, there has been a shift within the use of registries to develop and test research hypotheses.

Trauma registries contribute to processes that improve care[14]. An integrated, concurrent trauma registry provides a perfect data system for a performance improvement process, which is a necessary requirement for trauma center and systems. The trauma registry is a repository for specific data which will be evaluated, trended, and linked to outcomes. In busy trauma center and systems, the trauma registry is the nucleus for internal control inquiry. The trauma registry may be accustomed integrate financial data with care provision data and to project resource utilization for trauma centers and systems. Finally, the trauma registries supply data correlative to provider approving and provides information support for authorization, affirmation and nomination processes.

Our institute presently does not have a comprehensive record of the road traffic accidents in the form of a trauma registry. This compelled me to prepare a comprehensive record of the trauma patients presenting to our department, in the form of trauma registry.

Hence, I choose "A prospective demographic study of trauma registry in Netaji Subhash Chandra Bose Medical College, Jabalpur" as my research topic to evaluate and analyze the demographic characteristics and other relevant data of patients in our set up.

Aims And Objectives:-

1. To collect data related to trauma registry presenting to our center.
2. To analyze the demographic characteristics and other relevant data of patients admitted in our center.
3. To review the literature.

Materials And Methods:-

A Prospective descriptive demographic study was conducted in Department of Orthopadics, Tertiary care center Netaji Subhash Chandra Bose Medical College and Hospital Jabalpur from 1st January 2020 to 30th June 2021. This center is having 24 hour emergency Surgical, Medical, Orthopaedic. In Our center 24 hours available Operating theatres, Magnetic resonance and ultrasound imaging and Digital X-ray machine.The study period 18 month from

1st January2020 to 30th June 2021. In this duration total of 25515 patients presented with trauma came in OPD and Emergency Center. Out of this 10241 Patients included who present at our center with history of recent Orthopaedic trauma and sustained fracture. Fracture includes upper limb, lower limb, pelvis and spinal injuries .The demographics, the place of injury, the pattern of injury, mode of injury (i.e. Road traffic accident, fall, assault),activity at time of injury, intent, type of velocity, alcohol consumption, first aid given at time of injury, source of referral, mode of transportation, severity of injury, part of body involved at the time of injury was noted in trauma performa. In our study excluded isolated head injuries and history of any operative intervention outside our center. The data collected and entered in Microsoft Excel and analyzed.

The Standard Data Capture Format, as recommended by the National Injury Surveillance Centre (NISC), MOHFW, Govt. of India, along with some modification (to cater the local needs) was used for recording the demographical and other information of the patients presenting with recent trauma to the Department of Orthopaedics, N.S.C.B. Medical College and Hospital, Jabalpur in the year 2020-21.

Initially, a pilot study was done in the month of December 2019, to analyze the difficulties encountered in the data collection, thereafter, the main study implemented from 1st January 2020, and the data collection done till 31st June 2021.

Observation And Results:-

Demographics Characteristics

1. Age Distribution

In our study, maximum number of patients sustaining trauma were in the age of 21-30 years (22%).

2. Gender Distribution

Out of 10241 patients, 7271(71%) were males and 2970(29%) were females. There was a major male preponderance in our study. As males are the breadwinner of house in our society and this activity involves travelling on roads, it seems that they are more vulnerable to injury.

3. Education

In our study, most of the patient taken primary education (26%) followed by higher education (14%).

4. Occupation

In our study, most of the patients belong to skilled labourer by occupation (28%).

5. Marital Status

In our study, most of the patients are currently married (72%).

6. Area Of Residence

In our study, most of the patients belong to urban residence (58%).

7. Registration Time

In our study, most of the patients (85%) came in OPD (Out Patient Department) time i.e. 8 AM to 2 PM.

8. Brought By

In our study, most of the patients were (68%) brought by their family members.

9. Medico Legal Case (MLC)

In our study, most of the cases are Non - MLC (52%).

Activity At The Time Injury

10. Place Of Injury

In our study, most of the patient was injured on road (56%).

11. Mode Of Injury

In our study, most of patients are injured by road traffic accident (56%).

12. Activity At The Time Of Injury

In our study, most of the patients were injured (56%) while on travelling.

13. Object Used (In Case Of Assault)

In our study, most objects used in case of assault were stick / blunt object (88%).

14. Intent

In our study, most of the trauma occurred by unintentionally (80%).

15. Types Of Velocity

In our study, most of the trauma occurred by low velocity (54%).

16. Alcohol Consumption

Out of total 10241 patients, 3789(37%) patients had taken alcohol. Out of 3789 patients, most of the trauma occurred by alcohol consumption by counterpart (48.6%).

Details Of Road Traffic Injury

17. Place of occurrence

In our study, most of the road traffic injury occurred on highway (41%).

18. Road user category

In our study, most of the patients are two wheeler riders (28%).

19. Type of collision

In our study, most of the road traffic injury occurred by runoff road (30%).

20. If two wheeler rider /pillion, use of helmet

In our study, most of the patients not wear helmet during injury (88%).

21. If car driver / occupant/ other four wheeler use of seat belt

In our study, 42% car driver use seat belt.

Pre hospital care details

22. First aid given before reaching the hospital

In our study, maximum number of the patients had taken first aid before reaching the hospital (56%).

23. If yes, than where was first aid given

In our study, most of the patient had taken first aid in nearby government hospital.

24. Source of referral

In our study, most of the patient came in our center directly on their own (36%).

25. Mode of transportation

In our study, most of the patient transported by private vehicle (46%).

26. Status of injured at the time of entry

In our study, most of the patients were conscious at the time of entry (90.5%).

27. Severity of injury

In our study, most of the injuries were grievous (88%) in nature.

28. Part of the body injury, along with fracture

In our study, most of the injury occurred on upper limb fracture (48%).

29. Treatment

In our study, most of the patient treated in emergency room and sent home (74%).

Discussion:-

In our study, the maximum numbers of patients were between the age group of 21-30 years. It is important to mention that middle age group is more likely to be exposed to road traffic accidents as compared to the older age group. Hence as expected the road traffic accidents are likely to occur in middle age group as reflected in our present study. This is consistent with other studies done by DevarshiRastogi et al[2], Sahdev P et al[15], SS Patil et al[16], which also show that injuries occur in more productive age group and they were more vulnerable to injury. Like other studies, in our study too, males were found to have more chances of trauma as compared to female. As males are the breadwinner of house in our society and this activity involves travelling on roads, it seems that they are more vulnerable to injury. This is consistent with other studies done by Aubakirova et al[3], Siva Balaji Reddy Satti et al[17].

In our study, the maximum number of patients (26%) had taken primary education, which is similar to study done by Issac M al[18]. Dan K Kisitu et al[19] found that the percent of individuals with post secondary education was 11% in the patient population but only 2% in the household populations. In our study, the maximum numbers of patients were skilled labourer by occupation (28%). Similar study by Benavides et al[20], who found that maximum cases of injuries have been reported during work or during occupation. The maximum number of patients in our study were currently married (72%). This is consistent with other study done by Sanjit R Konda et al[21], who examined the role a spouse plays in important course and eventual discharge decision made for middle aged and elderly orthopaedic trauma patients.

In our study, maximum number of the patients belongs to urban residence (58%). Study performed by C Zwerlind et al[22] is contrary with other research comparing crashes in rural and urban environment, they found that fatal crash incidence density is more than two times higher on rural than urban roads. In our study, maximum number of the patients came in OPD time i.e. 8am to 2 PM (85%). This is consistent with other study done by Kundavaram Paul PrabhakarAbhilash et al[23]. In our study, maximum number of the patients were brought by their family members

(68%). This is consistent with other study done by Roy N, Murlidhar V et al[24], who found that related family members or friends constituted 22.4% of the rescuers. This was the informal social network that Mumbai victims relied on for help during burdensome situations. This group speedily reached the site of accident and took charge of subsequent care and transport for the injured victim. The transport preferred by this squad was a taxi or private ambulance.

In our study, maximum numbers of the cases were Non-MLC (52%). This is not consistent with other study like Avinash H Waghmore et al[25], which revealed that the maximum number of cases were road traffic accident. A study Garg V et al[26], observed that road traffic accident are increasing at an alarming rate due to increasing number of vehicles, poor road conditions, negligence regarding traffic rules and also the safety policies. In our study, maximum numbers of patients were injured by Road traffic accident (56%). This is consistent with other studies done by Patil SS et al[16]. Rajeev Shukla et al[27] found that among the various injuries, road traffic accident was the commonest cause of injury (46.85%) followed by assault and fall injuries in adults and paediatrics age group.

The maximum numbers of the patients in our study were injured on travelling (56%). This is consistent with other study like LuzituSeverin Nangana et al[28] found that exceeding the speed limit, distracted driving (text messaging, calling on phone, chatting), overtaking, careless driving/ risky maneuver and driving under the influence of alcohol were most prevalent explanation for road traffic accident occurrence. Other cause included low visibility and scientific problem. In our study, maximum number of object employed in case of assault was stick / blunt object (88%). This is consistent with other studies done by Ole brink et al[29], who found that main part of the injuries were results of blunt violence, which especially was dispensed out as fist blows or kicks. In the incidences with a penetrating trauma, it was most frequently caused by broken glasses and bottles. Weapons like clubs, knives and guns were on the opposite hand only accustomed to a limited extent. The described pattern of violence with a domination of blunt violence by blows and kicks and a rare use of proper armament.

In our study, maximum number of the trauma was done unintentionally (80%). This is consistence with other studies done by Lalwani S et al[30]. Xiling yin et al[31], who identified unintentional injuries (95.1%) and intentional injuries (4.9%). Blunt injuries counted for 59.4% of violent attacks, while cuts and poisoning counted for 37.1% and 23.4% of injuries requiring self-mutilation/suicide, respectively. For unintentional injuries, falls (50.4%) ranked first. In our study, maximum number of the trauma occurred by low velocity trauma (54%). This is consistent with other study done by Baru, Ararso et al[32], who found that concerning injury severity level, about 132(36.4%) of the road traffic collision victims sustained severe injuries while the remainder of respondents sustained non-severe injuries. In our study, maximum number of the trauma occurred by alcohol consumption by counterpart (18%). This is consistent with other studies done by Cheng-Shyuan Rau et al[33]. SS patil et al[16], who found that consumption of alcohol before their injury were more likely to hurt a facial injury and have a lower initial GCS as decided upon presentation at the emergency department. In our study, maximum number of the road traffic injury occurred on highway (42%). This is consistent with other studies done by Peden M, Scurfield R et al[4]. Gururaj G et al[34], who found that infrastructure expansion in India is increasing at a major pace in recent years. Nearly half of the crashes and deaths occurred on national highways and 36–38% of deaths occurred on state highways in 2019.

In our study, maximum number of the patients was two wheeler riders (28%). This is consistent with other studies done by Mishra et al[35]. SS Patilet al[16] who found that among the driver, motorized two wheeler drivers (61.2%) were commonly involved. This could be due to higher speed, which can be a achieved over short distance and less stability of the vehicle. In our study, most of the road traffic injury occurred by runoff road (30%). This is inconsistent with other study done by Chador Wangdiet al[36],whoshows 41% involved collision of two vehicles followed by 30.1% from collision with stationary object, 19% From going off the road, 8% from knocking down the pedestrian and 1% from others such as hitting animals. In our study, maximum number of the patients did not wear helmet during injury. This is consistent with other studies done by Kudebongetal[37]. Siviroj P, Peltzer K et al[38], found that 44.2% of the motorcycle riders had not been using a helmet. Nearly half of the motorcycle riders (49.6%) had a traveler (60.2% female and 39.8% male) of which 72.5% had not been wearing a helmet. Motorcycle users carry the most serious injuries leading to disability and death around the head and neck. Wearing a standard, good quality motorcycle helmet can diminish the risk of death by 40% and threat of critical injury by over 70%.

In our study, 42% car driver use seat belt during injury. This is consistent with other study done by E. Brooker Lerner et al[39], who showed that seatbelt use was more likely to be announced for older persons, women, isolated with significant incomes and drivers. Seatbelt use should be motivated for everyone; however, young people men

solitary with lower incomes and passengers should be selected specifically. In our study, maximum number of the patients had taken first aid before reaching the hospital (56%). This is inconsistent with other study done by Kobusingyeet al[40]. Nobhojit Roy, V. Murlidharet al[24], found that no pre-hospital care was available for more than half the victims arriving at the trauma center. Of the 48.3% who received some kind of first aid, most received inadequate care. The reason for the provision of inadequate pre-hospital care was based on economics rather than the lack of available manpower.

In our study, maximum number of the patients had taken first aid in nearby government hospital. This is consistent with other studies done by Gumberet al[41]. Nobhojit Roy et al[24], who found that most of the patients went straight to a public or government hospital for medical care. They mentioned that they were better off there than with the reluctant private sector (80% of the hospitals in the urban area are fee-for-service). The reasons was that there were round-the-clock facilities at the government hospital, available emergency diagnostic and blood facilities, involvement of police and legal enquiries and no risk of being denied treatment due to non-payment of bills. Most of the patients came in our center directly on their own (36%). This is consistent with other study like IreniusKonkor et al[42], who show that 10.95%, 10.4% and 78.7% of the study sample identified car, bicycle and motorcycle/ tricycle as their common mode of transportation respectively. In our study, most of the patients were transported by private vehicle (46%).This is consistent with other studies done by Nobhojit Roy et al[24]. Mock CN et al[43] found that 71% of the patients were transported to the hospital by a commercial vehicle, including taxis (54%), buses (14%), and trucks (3%). Private vehicles brought in 20% of the patients. Ambulances brought in 3%—all were inter hospital transfers.

In our study, most of the patients were conscious at the time of injury. This is consistent with other study done by Prashant Bhandarkar et al[44]. Jose Eduardo Aranyes Sanchez et al[45] found that 14.94% of the patients were lost consciousness and 85.06% did not. Most of patients had lost consciousness in only severe injuries. The most affected age range was within the 15 to 36 age brackets, these age groups are more populous and may be more likely to use motor vehicles. In our study, most of the injuries were grievous in nature (88%). This is consistent with other study done by NjokuIssacOmake et al[46], who found that fractures including machete related ones are considered grievous hurt from the medico legal point of view. In our study, most of the injury occurred on upper limb fracture (48%). This is consistent with other studies done by Clark DW et al[47]. But in another study done by Jha N, Srinivasa et al[48] found that among fractures lower limbs were the commonest site for fracture, followed by fracture of upper limbs and facial bones. In our study, most of the patients treated in emergency room and sent home (74%). This is inconsistent with other study done by SanghamitraPati et al[49] found that majority of the cases have admitted to hospital wards 77% and about 11% cases were discharged to home, while 7.6% left against medical advice. The survival status of the reported, majority of the patients had survived and about 3% have died in emergency department.

Summary:-

Trauma is a major global challenge more so because it is the leading cause of morbidity and mortality in young population. Trauma registries contribute to processes that improve care. They serve one primary function: to assess and improve patient care. We prepared a comprehensive record of the trauma patients presenting to our department, in the form of trauma registry. The summary of results of our study is as follows:-

1. Maximum numbers of patients were between the age group of 21-30 years.
2. Males were found to have more chances of trauma as compared to female.
3. Maximum number of patients (26%) had taken primary education and were skilled labourer by occupation (28%) and were currently married (72%) and belonged to urban residence (58%).
4. Most of the patients came in routine OPD time i.e. 8am to 2 PM (85%) and were brought by their family members (68%) and were Non-MLC (52%).
5. Maximum number of the patients were injured on road (56%) by Road traffic accident while travelling.
6. Most of the trauma occurred unintentionally (80%) and occurred by low velocity trauma (54%). Majority of the trauma occurred by alcohol consumption by counterpart (48.6%).
7. Majority of the road traffic injury occurred on highway (42%) by was two wheeler riders (28%) and occurred by runoff road (30%). Most of them did not wear helmet during injury. Only 42% car driver use seat belt during injury.
8. Maximum number of the patients had taken first aid before reaching the hospital (56%) and had taken first aid in nearby government hospital.
9. Most of the patients came in our center directly on their own (36%), for treatment rather than being referred by someone else and transported by private vehicle (46%).

10. Most patients were conscious at the time of injury. Although their injury was grievous in nature (88%). Mostly with mostly involvement of upper limb fracture (48%), most of the patients treated in emergency room and sent home (74%). Only 25% of the patients presenting to our department / centrewere admitted for definite care.

Conclusion:-

Jabalpur division after its enrolment into the smart city project has become a centre of immense infrastructure development and connectivity in the recent years and therefore there is a growing burden of trauma related injuries in this region. Road traffic accidents attract the least attention from the health administrators and the consequent allotment of funds, although they are a major preventable cause of mortality and morbidity. Our study would help in raising the profile of road traffic accident as a public health problem and for planning further appropriate interventions. There is a need for co-operation between government officials, of both the state and central government, as well as non government organizations, including public forums and interventional organizations to find measures to prevent road traffic injuries. Although we have adequate laws for injury prevention, they have not been strictly enforced by law. Changes in the attitude of the people towards traffic rules and road safety is also a must for preventing RTA. Our institute, Netaji Subhash Chandra Bose Medical College is situated on two National Highways (NH7 & NH 12) due to which, we get a large number of patients with high velocity trauma and mass casualty from these highways. The institution also gets a lot of patients from agricultural and industrial trauma. Our study attempts to assess the burden of trauma presenting to our Orthopaedic Department in our Medical College. We cannot comment on the overall burden and pattern of injury nationwide or in our state. Although, our region specific information for the epidemiology of injury has outlined the need to establish a Level I Trauma Centre at our Institute, so as to further evaluate effective strategies for the prevention of related mortality and morbidity. Our research in the form of trauma registry at our teaching hospital is a small step in that direction. Need for trauma centre at our institute is of utmost urgent requirement as the number of non traumatic musculoskeletal pathologies that are getting operated at our centre has provided limited scope for trauma cases that require emergency management. Moreover a holistic collaboration between different surgical specialties can improve the overall mortality and morbidity rates of the region. Our study has also substantiated the need of safe driving practices viz, wearing helmets, securing seat belts, abstaining from attending telephone calls while driving, avoiding drink and drive situations, following traffic rules etc. as some of the many steps that can drastically reduce the trauma related mortality and morbidity.

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