Trauma care systems in India – an overview

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Abstract

Trauma-care systems in India are at a nascent stage of development. Industrialized cities, rural towns and villages coexist, with variety of health care facilities and almost complete lack of organized trauma care. There is gross disparity between trauma services available in various parts of the country. Rural India has inefficient services for trauma care, due to the varied topography, financial constraints and lack of appropriate health infrastructure. There is no national lead agency to coordinate various components of a trauma system. No mechanism for accreditation of trauma centres and professionals exists. Education in trauma life-support skills has only recently become available. A nationwide survey encompassing various facilities has demonstrated significant deficiencies in current trauma systems. Although injury is a major public-health problem, the government, medical fraternity and the society are yet to recognize it as a growing challenge.

Key Words: Trauma System, India, Developing Country, Health System, Trauma Care.

Accelerated urbanization and industrialization have led to an alarming increase in the rate of accidental injuries, crime and violence in India. An unprecedented increase in the number of vehicles has outpaced the development of adequate roads and highways. India has 1% of the motor vehicles in the world, but bears the burden of 6% of the global vehicular accidents. It is well recognized that our health care system is not fully equipped to meet the challenge.

In May 2002, Academy of Traumatology (India) undertook a maiden study of trauma systems, regardless of their stage of development or geographical region. One hundred and forty-five institutions across the country, including university hospitals, other government, non-government and private hospitals in urban and rural areas of all states in India were invited to participate in the survey. The survey consisted of a comprehensive questionnaire concerning all major components of a trauma system. Fifty institutions participated in the survey. The overall data was fairly representative of urban and rural settings, private and public hospitals and facilities across all geographical regions of the country. The responses were analysed and the findings are included here under appropriate headings.

Injury as a problem

Road-traffic accidents are increasing at an alarming annual rate of 3%. In 1997, 10.1% of all deaths in India were due to accidents and injuries. A vehicular accident is reported every 3 minutes and a death every 10 minutes on Indian roads. During 1998, nearly 80,000 lives were lost and 330,000 people were injured. Of these, 78% were men in age group of 20-44 years, causing significant impact on productivity. A trauma-related death occurs in India every 1.9 minutes. The majority of fatal road-traffic accident victims are pedestrians, two wheeler riders and bicyclists.

No credible data is available to ascertain the outcome...
of trauma victims; it is generally perceived that outcomes in patients with single system injury (e.g. musculoskeletal trauma) have improved. Unfortunately, the same cannot be said for polytrauma. There is a high mortality rate amongst those with multisystem injuries, which can be attributed to the primitive state of trauma-care systems, lack of prehospital care and inadequate critical care. It is established that the mortality in serious (ISS > 16) injuries is six times worse in a developing country such as India compared to a developed country.9

**Administrative components**

Despite trauma being a major public-health problem with high morbidity and mortality, the Ministry of Health does not have a designated unit to deal with issues related to trauma. There is no central government agency to integrate policy-making, planning, financing, drafting legislation or establishment of minimum standards for the performance of a trauma-care system. No reliable institutional arrangement exists to lead the development of such a system in any Indian state. In 26% of the systems surveyed, the overall responsibility for leading the system was undefined. The Centralized Ambulance Transport Service (CATS) of the Government of the State of New Delhi is the only noteworthy state initiative in this direction. This is restricted mainly to prehospital care. Only 28% of respondents identified the presence of a unified leadership coordinating various components and agencies.

The existing systems for trauma care are elementary in nature, predominantly restricted to cities and semi-urban areas, without integration of region or statewide systems. No such systems exist in rural and remote areas to offer prompt life-saving treatment and safe transfer to an appropriate facility. Consequently fatal accident rate (expressed per kilometer of travel) in India is estimated to be sevenfold worse compared to most advanced states.7

The trauma systems operational in cities, with the exception of New Delhi, receive significant contributions from the private sector. In cities such as Mumbai, Pune, Bangalore, Hyderabad, Ahmedabad and Chennai, the trauma systems are at an embryonic stage, predominantly supported by non-government and private agencies.

No law exists to ensure prompt access to life-saving treatment for trauma victims. Statutory provisions to aid national, state, or interstate planning and implementation of trauma-care systems, regardless of jurisdictional boundaries, are yet to evolve. Issues such as the accreditation of trauma centers and critical care units, specialist licensing of health personnel and mandatory training of physicians lack national guidelines. The publication of ISCCM guidelines for ICUs is an important step in that direction. Legislative provisions for the minimum qualification of ambulance personnel, the type and quality of ambulance equipment and essential hospital capabilities are not in place.5

**Clinical and operational components**

In the absence of guidelines, the workforce available for prehospital and hospital-based critical care varies enormously. Available personnel and their skills often do not match the needs of the patients. The optimal number and type of prehospital personnel for ambulances is not defined. The concept of a dedicated trauma team is not accepted at all levels. At a majority of hospitals in the public health system, the casualty medical officer is the only one to respond to a demand for major resuscitation. This paradox is striking, resulting in the most seriously injured patients frequently being dealt with by the most junior and inexperienced staff.9 There are no plans for dynamic and flexible responses to the optimal management of trauma patients. The lack of precise and predetermined role allocation during peak periods of activity stresses the fragile current systems and workforce.

**Education**

The state medical and nursing councils control the educational and licensing requirements for physicians and nurses. However, formal education and specialty training (in emergency medicine, trauma surgery and critical care) are not mandatory for personnel involved in trauma care and available at select private institutions. The standardized education in trauma life-support skills is made available through the efforts of Academy of Traumatology (India) under the ‘National Trauma Management Course’ (NTMC) with accreditation from the International Association for Surgery of Trauma and Surgical Intensive Care (IATSIC). Currently this training is available mainly in larger centres and is intended for doctors. So far over 2500 doctors have received training through this programme. The issues of educational standards, certification and continuing education and evaluation requirements for doctors involved in trauma care are yet
to be addressed. The National Board of Examinations has recently begun registering courses in trauma care, though in a very limited manner. There are no minimum stipulated educational standards for paramedic and ambulance personnel. Paramedic training programmes are offered in major institutions but there is no accreditation, review or provision for periodic update of skills and knowledge.

**Prehospital Care**

Prehospital care is virtually non-existent in most rural and semi-urban areas in India, and implementation of the ‘golden hour’ concept is still an unachieved goal. The concept of a coordinating agency and a designated authority is restricted mainly to cities where trauma systems are operational in some form. Quite often there is an overlapping of private and public facilities and ambulance services in an urban geographical area. Gross discrepancy is seen in prehospital services between urban and rural settings, as well as between paying and non-paying patients. In the absence of guidelines and trained paramedical staff, decisions about evacuation of the victim and the choice of the destination hospital are made on an individual-case basis. These choices are often made at the behest of patients or their kin.

Formal licensing to run an ambulance service is not mandatory. Ambulance services are run by a multitude of organizations including government, police, fire brigades, hospitals and private agencies. Of the facilities surveyed, 12% reported a total absence of any ambulance service. Air ambulance services are not widely available and only 4% of the surveyed systems have even minimal access to air transportation, run by private agencies. Some facilities surveyed even had to rely, at times, on waterways to transport injured victims.

The absence of minimal educational and training standards for paramedics brings in unskilled labour to handle the most delicate of tasks. Many private hospitals in large cities offer efficient prehospital care, but this covers too small an area and too small a segment of the population. No national or regional guidelines exist for triage, patient-delivery decisions, prehospital treatment plans and transfer protocols. Policies, procedures and regulations governing medical directions are in place only in some city systems. There are recent attempts to provide one-time formal training in prehospital care to the ambulance personnel in various parts of the country. Currently, only 4% of the ambulance personnel have any certified formal training. The number of paramedics in the ambulances varies considerably. One-third of ambulances serve only as transport vehicles with no paramedic staff. Only 28% of the ambulances have two or more paramedics.

Only 50% of ambulance services reported skills and resources for providing airway support and appropriate splintage. The majority of ambulances have the means for intravenous infusion (74%) and blood-pressure measurement (62%).

**Communication system**

Despite technological advances, communication in trauma systems in India remains rudimentary and inefficient. Only 14% of the systems have a dedicated central telephone number for incident reporting. Some 30% of the trauma systems, mainly in cities, are equipped with wireless communication. Only 4% of systems have a comprehensive network operational between hospitals and ambulances.

**Disaster Preparedness**

India is a disaster-prone country with frequent floods, cyclones, landslides and earthquakes. Train accidents and industrial mishaps are not uncommon. Government plans are in place, in general, to deal with disasters. However, regular drills to test preparedness are not carried out. Only 26% of the systems in the survey reported a well-documented disaster management plan. The rest of the systems have plans under development, or no plans. This deficiency has resulted in excessive numbers of deaths in natural disasters. In 1999, there was an increase of 20.8% in fatalities due to such disasters compared to the previous year. This figure for 2001 is likely to rise even further as a result of a killer earthquake in Gujarat, causing over 12,000 deaths.

**Definitive Trauma-Care facilities**

Definitive care for trauma victims is offered by government hospitals, corporate hospitals and a large number of small clinics across the country. Facilities that offer treatment for trauma victims, at different levels, report 10% to 30% of their beds occupied by people injured in road accidents.
Most government hospitals offer free care, but the quality of that care differs from one centre to another. Most university hospitals provide a reasonable level of care; these hospitals are able to fulfill the role of tertiary trauma centers but critical care continues to remain the weak link in such settings for a variety of reasons. Private and corporate hospitals, located mostly in large cities, are equipped with modern diagnostic and imaging facilities, good operating environments and intensive-care units. Some of them also run dedicated trauma services. However, there are no norms to govern their standards and their relations with the public trauma system. On the other hand, the district hospitals often lack trained staff, adequate infrastructure for management of polytrauma and supply of consumables. Small hospitals and clinics mushrooming across India are simply unable to cope with polytrauma, due to lack of multidisciplinary support, particularly the critical care units. Such small establishments struggle to manage severely injured patients, resulting in substandard care and high mortality.

Only 54% of the hospitals have set protocols for triage. In 30% of the hospitals, the casualty medical officers are the only physicians available to provide resuscitation. Their level of training and experience in providing life support is not uniform. The concept and practice of forming dedicated trauma-response teams is yet to percolate beyond tertiary-care hospitals. In acute and elective management of trauma patients, only 36% of the facilities follow NTMC, or locally developed clinical protocols.

There are no dedicated trauma surgeons in India. Orthopaedic surgeons lead the trauma response in 50% of facilities. In the remainder, the responsibility is not clearly defined. Clinical decisions are often delayed, in the absence of clear perceptions of clinical responsibility amongst specialists, putting patients with multi-system injury at a greater risk.

**Interfacility transfer**

Nearly half of the systems surveyed have no protocol for interhospital transfers. Linkages between rural and urban facilities do not exist in most regions. The availability of specialist care (for e.g. spinal trauma, burns, head injuries, childhood injuries etc.) is restricted to major cities and teaching hospitals. Transfer to such a specialty centre in an emergency is often difficult and time-consuming, resulting in delay in decision-making and management.

**Rehabilitation**

Rehabilitation, though an integral element of any trauma-care system, is a neglected area in India. It is restricted to physiotherapy in most centres. Although 76% of the facilities offer physiotherapy services, only a third offers occupational rehabilitation and psychological counselling. The surveyed hospitals failed to demonstrate strong links and transfer agreements between acute facilities and rehabilitation units. Social security, retraining, as well as employment and other support schemes from the government for the rehabilitation of the injured, are limited; only a few voluntary organizations offer such assistance.

**Information systems**

It is widely known that not all accidents are reported to the police, for a variety of reasons. It is estimated that for every one death, nearly 10-20 people will get hospitalized and 50-100 will receive emergency care in hospitals. The information systems in most places are manual and rudimentary. There is no central trauma registry in any state. Most hospitals have reliable data on trauma admissions, but only 40% have data on the clinical outcome of the trauma patients. This lack has a negative impact on development and implementation of an effective public policy on trauma care.

**Evaluation and research**

In the wake of the gross disparity between accessibility and affordability of trauma care; quality assurance is a major casualty. In the absence of a lead agency and with a poor information system, evaluation and research on trauma systems is a difficult proposition. Monitoring of the performance of the system and its individual components, and any quality-improvement programme, is far away. Very little work has been done to evaluate the working of trauma systems in India. CATS New Delhi and CMC Hospital, Vellore [6] have assessed some components of their systems.

**The future**

The future appears both daunting and challenging. It is estimated that from its present position of the ninth leading cause of deaths in India, trauma will move up to third position by 2020. It is also estimated that in the
developing countries over 6 million will die and 60 million will be injured, or disabled, in the next 10 years. India will have a large share in this, with an estimated economic loss of around 2% of GDP. To meet this challenge several efforts are required: resource creation, education, legislation, upgrading prehospital and hospital based care, public awareness and a change in the attitude of the policy-makers. The public health institutions will also benefit from adopting WHO Essential Trauma Care guidelines for trauma care, which is aimed at low cost improvements to the trauma care. There are already some ongoing efforts in that direction.

Although the overall picture in trauma care is not as dismal as it used to be three decades ago, ‘trauma care for all’ continues to remain a distant dream in India. Despite significant overall progress in many other fields, trauma systems in India continue to remain at a formative stage for various reasons. A concerted effort from all the parties involved, as well as the society, is the need of the hour.

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