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Original Research Article

Current Status of Essential & Emergency Neurosurgical care in India

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Abstract:

Traumatic brain injuries (TBIs) are a leading cause of morbidity, mortality, disability and socioeconomic losses in India. Road traffic injuries are the leading cause (60%) of TBIs followed by falls (20%-25%) and violence (10%). About 5,04,123 RTAs occurred in 2015 in India with 1,46,135 deaths, averaging to about 1374 accidents daily and about 400 deaths/day. These data makes us the leaders in the world in RTAs. On the other hand, comparing this with developed world, in Sweden only single death occurred due to RTA in 2015, which is hard to believe.

It is not as if the development of trauma care in India has significantly lagged compared to global standards. Over the years, the number of Trauma Centers has increased with adequately equipped units distributed in different corners of the country based in and around major cities. But there is uneven distribution of emergency and essential neurosurgical care with even basic trauma care missing from small towns and rural areas. Even in big cities, slum dwellers and poor population lack accessibility to quality neurosurgical care.

We hereby discuss the current status of trauma care and various hurdles faced in providing emergency & essential neurosurgical care at the grassroots (Rural) as well as at the higher urban (Metropolitan) levels.

Keywords: Trauma Care, Health Care, Emergency Neurosurgery.

Introduction

Healthcare system in India

Health care in India is mainly provided by-

- Public sector
- PPP (private public partnership) model
- Private sector in the form of corporate hospitals or personal private clinics.

Health care system in rural India

Public sector

India has got a well-structured public health system in the rural area where 70 % of population lives. From the pre independence era, a network of comprehensive healthcare delivery system has been present in rural India. Despite being a well-structured system, it lacks the infrastructure and manpower grossly. In 2005, there was 12% deficiency of subcentres in India. Similarly, there was deficiency of 16% in primary health centre (PHC) and 50 % in community health centre (CHC)[18]. There is only one doctor per 1,700 citizens in India while the World Health Organisation stipulates a minimum ratio of 1:1,000. India will take at least 17 more years before it can reach the World Health Organization's (WHO) recommended norm of one doctor per 1,000 people India.[22] There is major shortfall of manpower at rural level. Many posts of specialists are vacant, with greater the qualification required for the post more is the need gap.[17] Doctors who are posted in the rural areas do not want to work there due to overall infrastructural inadequacy and lack of incentives [17].

Referral system is also poor. In this scenario, it is hard to believe that quality emergency and essential neurosurgery could be available at rural areas.

Private sector

Due to lack of adequate infrastructure and manpower at public health care facilities, private sector is booming as a dominant force in all sectors of health care services. As big corporate hospitals and good private clinics are mainly located in cities, rural population has not got accessibility to quality trauma and neurosurgical care. As there is poor connectivity with cities they cannot reach their in time in case of emergency. A very large proportion of the rural health care providers in the private sector are not qualified. They are often illegal medical practitioners or under-qualified for the task at hand [17]. As a large section of rural population is illiterate and unaware they go to these

practitioners in case of emergency. Referral system is also not so developed in rural areas.

Health care system in urban India

Public sector

Urban India has high concentration of quality health care providers, despite it, not everyone has easy access to health care. Secondary level health care is provided at the district hospitals and tertiary care is at the teaching and nonteaching hospitals at the cities. District hospitals often lack trained staff, adequate infrastructure, and supply of consumables. One study estimated that 37% of doctors in India (63% in rural and 20% in urban areas) had inadequate or no medical training [14].

Tertiary care teaching hospitals provide a reasonable level of emergency trauma care, but neurosurgical care is not present in all of them. Triage is very important in trauma care, but triage is rarely practiced, as there are no dedicated trauma surgeons at hospitals and very few designated trauma centers in India [9]. Some other problems are enumerated here.

- With ambiguity of responsibility amongst specialists, clinical decisions are often delayed, and poly-trauma cases are vulnerable to suboptimal team management [14]
- Problem of overcrowding in OPDs
- Long waiting list for surgeries
- Due to traffic and poor ambulance system, people have poor accessibility to emergency tertiary health care.

Urban poor and slum residents generally have poor access to high quality care. Despite being, in close proximity to high quality government clinics they prefer small private clinics, reason being ease of access [19].

Private sector

Private hospitals are equipped with modern devices and quality care, but they offer services at a price that sometimes hinders people from getting care [17]. There is also uneven distribution of private hospitals with good trauma and emergency neurosurgery care. Big corporate hospitals are located in tier one and tier two cities only.

At district and sub-district levels we have got small private hospitals and small clinics only, with not so well-developed trauma and emergency neurosurgery care. There are many challenges with private hospitals (smaller ones) [20].

- Accountability
- Sustainability
- No supervision and monitoring system
- No cooperation and coordination among them.
- They avoid medico -legal cases and emergencies

PPP model

The concept of public–private partnership (PPP) blends best of both worlds, where government and private enterprises successfully work together for primary health care delivery in India. One of the most successful PPP models in India is EMRI. Emergency Management and Research Institute (EMRI) provides prehospital emergency care free of cost with the creation of a single emergency toll free number, '108' with a network of hospitals, launched on August 15, 2005, in Hyderabad. GVK EMRI is currently operational in 15 States and 2 Union Territories i.e. Andhra Pradesh, Telangana, Gujarat, Uttarakhand, Goa, Tamil Nadu, Karnataka, Assam, Meghalaya, Madhya Pradesh, Himachal Pradesh, Chhattisgarh, Uttar Pradesh, Rajasthan and 2 Union Territories, Dadra & Nagar Haveli and Daman & Diu. They are cooperating to stabilize the patient free of charge [4]. Various other successful public private partnership experiences in India are [21]-

- Yeshasvini Health scheme in Karnataka
- Arogya Raksha Scheme in Andhra Pradesh
- Telemedicine initiative by Narayana Hrudayalaya in Karnataka
- Contracting in Sawai Man Singh Hospital, Jaipur
- Rajiv Gandhi Super-specialty Hospital, Raichur, Karnataka
- The Uttaranchal Mobile Hospital and Research Center (UMHRC)

Pre-hospital care in India

Pre-hospital care is not so well developed in India. Emergency medical services (EMS) are new to India even in the metropolitan cities. There was fragmented distribution of ambulance services in India till recent times, which were not able fulfill the demand of such a huge population. According to a study, almost a third of patients succumb to death prior to hospital and only one–fifth receive any medical care within an hour in the absence of proper ambulance care [4]. Ambulances are often used more for inter hospital transports & non-emergency calls, these are often little more than transport vehicles [13].

The present prehospital care set-up is largely geared for handling medical emergencies, and not traumas. There are no dedicated medical staffs trained in trauma care. In one study it was found that First- aid was provided by trained person (doctors/paramedics) in 60% cases only and in rest 40% cases first aid was provided by general public/police man without any formal training to attend trauma cases.[9]To compound the delay, all the injury victims have to be registered as a police case before or during management. This leads to delay in treatment of trauma patients.

Current Status of neurosurgeons and trauma personnel

There is polarization of the distribution of neurosurgeons in the country. More than 90% neurosurgeons live in metropolitans or tier-1 and tier-2 cities, with only 2.67% living in rural areas covering a population of 84.59 million.[7]

Those present, too does not want to work in government setups, as a senior consultant neurosurgeon in a private corporate hospital makes at least ten times more money than a full-time dedicated professor of neurosurgery in a teaching hospital. Hence many neurosurgeons after acquiring professional experience prefer to work in larger corporate centers or join private hospitals [10]. Also, there is abundant clinical material in a government hospital but there are no facilities for research, documentation and publication [4].

Indian Universities only train 387 new postgraduates annually in neurology and neurosurgery leading to large scarcity of neurosurgeons with heavy load on existing ones. Thus they have little time for their academics and research [7].

Formal training in trauma care is neither offered nor obligatory in India. Doctors posted in the casualty departments often rotate from various specialties such as surgery, orthopedics, and medicine and have little commitment to trauma care. Presently the nurse physician ratio in the country is 1.5:1 as against international norm of 3:1[22]. Thus, there is severe shortage of neurosurgeons and trauma personnel in India.

Government initiatives in improvement in trauma care

US has the highest health spending in the world – equivalent to 17.9% of its gross domestic product (GDP) whereas India spends 4.1% of GDP on healthcare, which is much lesser than developed countries[22]. But government of India has taken huge steps in improvement of trauma care.

- At present, around 25 health insurances are running in rural India which are attached to microfinance institutions. Karuna trust and Yeshasvini trust in Karnataka, Bhamashah Swasthya Bima Yojana, Rajasthan, Deen Dayal Antyodaya Upchar Yojna in Madhya Pradesh and healing field health insurance in Andhra Pradesh are few initiative of state governments towards health insurance.
- At government hospitals, government is giving drugs at a subsidised rate, so that poor population can afford quality care at affordable price.
- Traffic rules are strengthened. Awareness programs are launched to improve traffic awareness.
- The government has started the process of creating uniformity in Emergency Ambulance Services across India. Along with EMRI, A PPP model, 108 service is running across India.
- As we all know there is scarcity of specialists and superspecialists doctors in India. Government has increased age of retirement of doctors in teaching institutes.
- The Ministry of Health and Family Welfare, Government of India has taken up plan to establish trauma care centers along the national highways to provide medical care and referrals to equipped healthcare facilities to deliver improved care for injury victims[4]
- Jai Prakash Narayan Apex Trauma Center (JPNATC) at the All India Institute of Medical Sciences (AIIMS) in New Delhi is set as a quality trauma care facility which will act as a model for other institutions providing trauma care in country.[6]

Current limitations in emergency and essential neurosurgery care at rural and urban level

Table 1:

S.No.	Problem	Rural	Urban
1.	Infrastructure	• Severely deficient with lack of equipment, poor or absence of repairs, improper functioning. • Lack of complementary facilities such as 24-hour running water, electricity back-ups, and so on.	• Better than rural. • But most centres lack proper maintainence of equipments and repair. • In infrastructure we lag behind developed countries at even tertiary level.
2.	Manpower	Shortfall of manpower due to vacant posts and Absenteeism. Only few Specialists and superspecialists.	Vacant posts and deficient manpower are problem at urban level too. Mainly due to inadequate number of specialist and superspecialist in country.
3.	Awareness of Health	Due to poverty and lack of	Awareness present in only

		education, no awareness of health.	educated ones. Slum dwellers lack awareness towards health.
4.	Affordability	□ Poor population so less affordability. □ Cannot access quality private health service, if needed and prefer unqualified practitioner over government setup due to ease of access.	□ Affordability better due to better paying capacity □ Slum dwellers and poor migrants cannot afford quality health care as in rural population
5.	Access to facility	□ Those who can afford do not get good health care service near them due to unavaibility. □ Poor referral system	□ Overburdened OPDs in government setup □ Long waiting list for surgery
6.	Law enforcement	□ Traffic rules and legislations not followed at all.	□ Insufficient enforcement of laws. □ Poor avaibility of paedestrian roads
7.	Transport system	□ Poorly developed public and private transport system. □ Poor road connectivity leading to delay in transporting emergency cases to tertiary centres.	□ Overcrowded roads □ Transport system not so developed at urban outreach area
8.	Telecommunication	Not so developed at rural level. Also, there is unavailability of suitable health personnel for telemedicine to function at rural level. So, telemedicine is just like a dream at present	Telecommunication system developed. Main problems in developing telemedicine are poor patient satisfaction, and inadequate government will.
9.	Government funding	Inadequate funding	Most of government funding are there at improving secondary and tertiary health care.

Discussion

Knowing the pitfalls in healthcare, steps should be taken from government and policy makers to improve the emergency and essential neurosurgical care in India. Around 0.9% of GDP (gross domestic product) is spent on health sector in India which is inadequate considering the huge demand of such a large population [18]. Government funding needs to be increased. We cannot expect to have a dramatic change in number of trauma centres overnight, but there can be upgradation of infrastructure in existing ones. There should be strengthening of pre-hospital emergency care and a single emergency number should be created countrywide. All personnel involved in prehospital care must understand the critical needs of the injured patients. There should be utmost priority to make doctors and paramedics competent with well-trained prehospital services. There is an immediate need to strengthen the MD/DNB programs in Emergency Medicine and also carefully develop advanced MCh/DNB (Sub Speciality/Super Speciality) programs in trauma surgery.

There should be separate training of trauma care for General Surgeons and Orthopaedic Surgeons during and after their specializations. Post graduate programs in General Surgery should incorporate sufficient exposure to acute Neurosurgery. This will help train the general surgeons to care for head injury patients if and when they are working in resource challenged settings and there is an unavailability of Neurosurgeons[4].

In hospitals where there are no trauma surgeons, neurosurgeons should train non-neurosurgeons in case selection for the emergency interventions so that emergency surgeries like extradural hematomas, chronic subdural hematomas, intracranial pressure (ICP) monitoring, external ventricular drainage, etc can be safely done, when needed. It is crucial to set up standard operating protocols wherever possible, as there is a diverse mix of clinical and para-clinical teams that interact in the ED.

India is a country with vast unmet medical needs. e-Health has the potential to improve the quality of

health care and reach the unreached. In a situation where there is paucity of qualified neurosurgeons, the best optimal solution is distance healthcare (Telemedicine). Unfortunately, Telemedicine has been able to cater only 0.1% of the population in 16 years. e-Health should be promoted by the policy makers[6]. Strengthening of m-health (mobile health) should be done by formalization of WhatsApp and other mobile apps.

By improving our system with better reporting and documentation of cases, we will be able to make a better plan to decrease the incidence of TBI and their timely appropriate multimodality approaches to achieve better outcome of these cases within our limited resources. Political determination with continuing efforts from the community can help control injury related and essential neurosurgical problems.

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