

# Emergence and Future of Telemedicine in Traumatic Brain Injuries in India

Mihika Sinha<sup>1</sup>

<sup>1</sup> Kasturba Medical College, Manglore, Karnataka, India

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Address for correspondence Mihika Sinha, Kasturba Medical College, Manglore, Karnataka, India  
(e-mail: mihikasinha94@yahoo.in; sinhavd@yahoo.com).

India is a subcontinent where more than 70% of the population stays in rural areas in comparison to the health specialists who are majorly concentrated in the urban sectors leaving the rural medical centers inadequate to serve the huge population.

It is a known fact that there is a perennial shortage of specialists all over the country which are largely concentrated in the urban areas, on top of this the increased migration of doctors to urban medical centers are adding to the major deficiency of providing the basic healthcare in the rural sectors. Hence, it stands as an ideal setting for telemedicine.<sup>1</sup>

There is a need of a major link between the primary health centers in the rural areas and large medical referral hospitals which would help in reducing the morbidity and mortality rates of the country. Combining the application of information technology in the health sector saw the emergence of telemedicine.

Telemedicine is the application of clinical medicine via telephone, internet, or other networks for the purpose of consultation and on occasions even carrying out certain medical procedures. Its wide spectrum of uses includes a simple conversation between two health specialists discussing a case to as complex as video-conferencing to execute a real-time consultation in two different countries.

It is here that telemedicine can be used to bridge the vast difference in the healthcare facilities especially to the geographically distant areas with medical centers so that less trained on-site personnel can provide the necessary health services with long distance help.

Telemedicine in neurosurgical trauma aims at enabling less trained onsite medical personnel, placed in geographically distant and medically deprived areas, with information, advice, and guidance for proper management of patient. In case of emergencies, it facilitates transfer of victim and manages life-threatening conditions achieved by connecting with specialized centers through satellite.<sup>2</sup> Telemedicine was started at Apollo Aragonda hospital in Andhra Pradesh in the year 2000 in India. Now, there are approximately 500 telemedicine centers linked with 50 specialist hospitals across the country.<sup>3</sup>

Advancement in telecommunication, information science, and technology in our country provides an opportunity to exchange knowledge and skill across centers which are deprived of medical facilities and link them to the medical centers of excellence.

The transmissions could help doctors consult with each other concerning a diagnosis and also provide teaching assistance to nurses and other paramedical staff in remote locations. Telemedicine holds its application in almost all the fields especially in trauma and emergencies, radiology, anesthesia, dermatology, psychiatry, neurology and trauma, critical care, etc.

Other applications include patient education, home-monitoring, continuing medical education, and for training purposes. It can also be useful in providing the resources otherwise not available in the physician's vicinity, top expert advice, and the latest in the diagnostic equipment.

It enables providers to transmit digital images such as X-ray films and magnetic resonance imaging for quick diagnosis which would also avoid unnecessary transfers thus decreasing the morbidity and mortality rates of the nation. In case of trauma and emergencies, time between accident and hospital admission can be decreased with the use of this emerging entity.

In various global experiences of telemedicine in neurotrauma, there have been promising results. Right from early diagnosis, triaging, starting definite treatment, and management, there has been significant improvement in outcome. Even trauma surgery interval has reduced and hence the outcome. Unnecessary transportation have been avoided.<sup>4</sup>

Despite its vast spectrum of uses, there are several barriers to its development. Our country still lacks the infrastructure required to nurture and maintain the execution of its working which requires qualified specialists, adequate learning materials, and advanced technology which are inadequate in a nation like ours where there are financial constraints. Major problems like referrals being too busy, lack of the follow-up for patients admitted, and security and privacy with regard to legal and regulatory measures hold back the progress and development of the same.

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To counteract the faultier in our system which threatens the application and growth of telemedicine in India, set of guidelines need to be set and constantly refined needed for its permanent integration in our health care system especially in a country like ours which still faces social, financial, and political barriers for its development. It will come out of its trial phase to its real application only when it is made cost-effective and more sustainable. In the era of decreasing medical budget, telemedicine has the potential to become a tool to ensure equity of healthcare among the deprived areas in our country.

An innovative proposal of virtual rural posting as incentive for postgraduate admissions, promotions, increments, etc., can help remote areas with right diagnosis, access to primary level management, and decision of centers for properly coping with the given status.<sup>5</sup>

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