Clinics in Surgery

Editorial
Published: 22 Nov, 2017

Telemedicine in the Management of Head Trauma

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Editorial

The term "Telemedicine" encompasses the entire spectrum of technology, armamentarium and processes that are required to enable history taking, conduct a clinical examination, perform investigations and manage a patient, with the consultant and the patient physically at different locations. It presupposes the availability of a Personal Computer (PC)/laptop/tablet/smart phone, a good video conferencing system/digital camera, adequate connectivity, and software to capture, store, transfer, visualize data, and enable the teleconsultant at the remote end to view reports and digitally manipulate images. Peripheral medical devices, for example, a blood pressure apparatus or an ophthalmoscope need to be connected to the internet to enable remote monitoring. The role of telemedicine lies in rendering the concept of "distance" and "terrain" meaningless. Once the "virtual" presence of a specialist is acknowledged, a patient can access resources existing in a tertiary referral centre without the constraints imposed by distance. It is easier to set up a telecommunication infrastructure in suburban and rural areas than to make specialists available there. In developing countries, most citizens do not have immediate access to an appropriate specialist. In a publication in March 2015 [1] the author conclusively demonstrated that 935 million Indians lived in areas where there was not a single neurosurgeon (or neurologist). Neurological expertise is not available in several areas of the world. A 20% of the US population does not have access to immediate neurological services. Establishing telemedicine would in part resolve the "man power" shortage problem. Deploying telemedicine would partly resolve the acute shortage of surgical specialists. Patients often travel far, at a considerable expense, when local treatment would have sufficed with tele-consultation. Head injuries are universally a public health hazard. In India a fatality occurs every four minutes, making head injury the sixth commonest cause of death. Only about 1800 neurosurgeons are available for a population of 1300 million. Only 200 new neurosurgeons qualify every year from 60 teaching programmers. There are less than 15 state of the art neuro trauma critical care units and 700 million living in rural India have no direct access to neurological care.

Telemedicine is particularly useful in neurotrauma by helping institute therapeutic measures before transfer and reducing unnecessary transfers. The author, in the last 17 years, remotely evaluated 335 patients with head trauma. Several serious head injuries were successfully managed. Patients were seen at peripheral telemedicine centers and also at their homes. Commercially available video conferencing systems were used. Laboratory reports and DICOM compatible images were uploaded at the remote end enabling digital manipulation by the tele-consultant. Tele-discussions of treatment options were conducted when transfer was recommended. Tele-consultation was used for subsequent follow-up. A general surgeon, tele-mentored by the author remotely, operated upon three cases of compound depressed skull fractures. Interestingly, there was a subsequent drop in neurosurgical tele-referrals from telemedicine-enabled centers. The doctor at this remote center had acquired the confidence to manage most cases of simple head trauma without the need for further tele-consulting. A study in France, revealed that tele-radiology had a positive impact on emergency neurosurgical care, reducing time to diagnosis, avoiding unnecessary transfers and initiating earlier pre-hospital management. The acceptance of tele-consultation by the rural patient, the suburban doctor and the suburban community was much better than expected. None of them were averse to a tele-consultation. The tele-consultants have also accepted virtual interaction with a patient. In a general, community hospital setting, less than 10% of head injuries require referral to highly specialized neuro intensive care units or surgery. Earlier, the family physician did not have the skills to manage head injuries or simple poly trauma cases. With immediate virtual access to specialists in tertiary care centers through telemedicine, this is no longer true.

References

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Received Date: *06 Sep 2017*
Accepted Date: *14 Nov 2017*
Published Date: *22 Nov 2017*

Citation:
Ganapathy K. Telemedicine in the Management of Head Trauma. Clin Surg. 2017; 2: 1755.