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ACUTE ISCHEMIC STROKE TREATMENT BARRIERS IN PAKISTAN

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Worldwide stroke is the second most common cause of death and the third most common cause of disability [(1).] No large-scale epidemiological studies are available to determine the true incidence of stroke in Pakistan. There is only one published stroke prevalence study which was conducted in a community residing in Karachi, the prevalence was 4.8%, however the results of the study should be interpreted with caution as a non-validated questionnaire was used. [(2).] Another community-based survey suggested as estimated 21.8% prevalence of stroke in an urban slum of Karachi [(3).] These studies although published in local journals but do not highlight the aspects of stroke treatment and prevalence. While the incidence is decreasing in high-income countries, it is increasing in low-income countries such as Pakistan, where there is not even a single established comprehensive stroke center with fully equipped facilities to do endovascular treatment of AIS. Medical advances in stroke treatment have greatly improved survival rates and disability from stroke during the last decade, these advances include cerebral angiographic techniques to remove the blood clot from brain vessels called Mechanical Thrombectomy. The quality of care and equipment available to stroke victims makes a world of difference. That is why the public needs to have access to the stroke center. Neurointerventional Radiology training and practice in Pakistan is still in early phases, being practiced in few leading hospitals of the country but no separate accredited postgraduate training program still available.

The routine practice in public and private hospitals in Pakistan is that of using stat dose of Aspirin in emergency (ER) at large with only a few handful of private centers

offering thrombolytic therapy with tPA (tissue plasminogen activator), no public hospital is offering this facility right at the moment. This too is found with a problem of long window periods before the patient reaches a proper stroke care center [(4).] Prehospital delay due to lack of stroke symptoms awareness, financial constraints, and lack of proper diagnostic facilities/infrastructure are the main barriers of thrombolysis therapy in Pakistan. Cheaper thrombolytic agent and proper infrastructure for utilization of thrombolytic therapy is the way to go in developing countries like Pakistan. [(5)]

In 2014, a pilot project was started in largest public hospital of Lahore to deal with AIS under the supervision of trained neuro interventionalist having 20 years' experience. The department of Diagnostic and interventional Neuroradiology and first acute stroke center is located in the heart of Lahore accessible from enormous routes so patients can reach urgently.

The Neuroradiological Society of Pakistan (NRSP) is a non-profit medical association that works to develop and support standards for the teaching and practice of neuroradiologists and neuro interventionalists. It was established in 2016 as a sub-society of the Radiological Society of Pakistan. In December 2014, in an international workshop which was conducted by joint efforts of local experts and international experts, the first catheter-based treatment of ischemic stroke was performed. During this workshop, two cases of acute ischemic stroke were treated with mechanical thrombectomy for first time in the history of the country and a stroke care program was established.

After these two successful cases, the first independent case of acute ischemic stroke treatment was done with mechanical thrombectomy in January 2015, in the same institution with limited resources. The treatment was a huge success. Since then we have treated over 100 cases of mechanical thrombectomy Though resources are limited, we still have promising results.

In August 2019, "First experience of mechanical thrombectomy outcome without bridging technique-A 3-year retrospective analysis" was published in an international journal. [(6).] The initial results of 35 treated AIS patients were compiled in that article. The results were published by same group of local and international experts.

The first NIR fellowship was started in 2019 in collaboration with Alexandria University hospital, Egypt. This is a 1-year fellowship programme, and 4 fellows

were recruited as first batch. So far there is no accredited fellowship program by the CPSP. After we started Mechanical Thrombectomy treatment, various other centers also started Stroke units in karachi and islamabad but they need complete infrastructure , proper trained physicians and governmental support in the form of hardware to further take a giant leap.

There are several challenges we are facing which are hurdles in the progression of neuro intervention as a specialty in the country. An important issue faced by us is the cost of the procedures as patients must pay out of their own pockets due to a lack of health insurance policy at a mass level. Furthermore, due to the nonavailability of local manufacturers, hardware is a problem and the cost escalations have to be borne by the patient which in turn adversely affects the number of procedures that can be performed. Despite these problems, there is increase in the number of patients.

Nevertheless, we pursue our efforts in establishing tertiary stroke care facilities and make public, government, and colleagues aware of Mechanical Thrombectomy. In doing so, we have become the part of MT2020 which is a global metric-driven, umbrella campaign to reduce death and disability associated with large vessel occlusion ischemic stroke by accelerating access to mechanical thrombectomy. MT2020 is mission thrombectomy which was launched by the US-based Society of Vascular and Interventional Neurology and over 100 countries are involved globally in MT2020. [7]

There are over 14 million patients that suffer from acute ischemic stroke annually. Nearly 6 million of those could potentially be treated by mechanical thrombectomy (MT) – but only about 140,000 are treated with MT, and nearly 70% of these procedures happen in the US and Western Europe. There are currently no studies available about the proposed number of populations presented with LVO in our country. According to a study carried out by Ansar Rai et al [8]. in USA, estimates an LVO incidence of 24 per 100 000 person-years. A current estimated annual thrombectomy rate of three procedures per 100 000 people indicates significant potential increase in the volume of endovascular procedures. If we apply the same statistical analysis to our population 31/ 100,000 are LVO cases which require mechanical thrombectomy and this ends up into total of 63527 proposed MT in Pakistan accordingly.

We need to motivate our government to take drastic steps to make this happen in LMICs like Pakistan and we need to Integrate the disparate knowledge of barriers to MT access worldwide .These goals can be achieved by unifying multiple efforts by local and specialty societies to accelerate MT access globally

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Sohail Akhtar; data collection, data analysis, manuscript writing, manuscript review