

Subspecialization, a Cause of Concern for Neurosurgeons in Pakistan, an Opinion Piece and Open Discussion

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Specialization is a process of becoming an expert. In medicine, it was a long and gruelling journey that medical graduates embarked upon in their chosen field with pride and enthusiasm to become leaders. The specialists seen as the culmination of years of hard work and the marker of prestige. In the old days this distinction was very apparent between the barber surgeons who had little to no formal education and trained as an apprentice and the physicians, who had a university education, went on to become fellows of one of the Royal Colleges and were treated as experts. Eventually, as knowledge expanded, 65 specialities fragmented from medicine and surgery and as of today 31 subspecialties are recognized by the general medical council in the UK.¹

Neurosurgery which was traditionally considered a very niche subspecialty of surgery and the smallest of all the surgical subspecialties has exploded into a myriad of branches of its own that have boomed in the last 3 decades, including endoscopy, complex spine, skull base surgery, functional neurosurgery and cerebrovascular +/- endovascular. This evolution in my observation had tremendous purview in the advancement of the speciality and improvement in the mortality of neurosurgical patients. After visiting the neurosurgical faculty in Lahore at major centres, I am inclined to say, that however the process of subspecialisation has become more political and in being so it poses threats to the Pakistani neurosurgical community and the patient population as a whole. It poses a risk to both patients and to neurosurgeons in Pakistan.

Pakistan is very unique, despite being a developing country, its government funded neurosurgical units are giants, and they are giants by virtue of their funding, their resources and their capacity. Allama Iqbal Medical College and Punjab Institute of Neuroscience in Lahore and Jinnah Post Graduate Medical Centre in Karachi are the premier

institutes for neurosurgery and some of the busiest neurosurgical departments in the world. We can lend their success to the esteemed faculty that works there. These centres are armed with equipment that is not found in the armamentarium of some neurosurgical suites even in most developed countries.

There were 150 qualified neurosurgeons in Pakistan in 2007,² this number is now estimated to have been more than doubled. The estimated population of Pakistan is around 212 million, this means that there is around 1 neurosurgeon per 0.7 million to 1.4 million people. The worldwide ratio is 1 neurosurgeon per 0.23 million and 1 neurosurgeon per just 81,000 people in North America.³ This sharp contrast has important implications. The honourable faculty widespread in Pakistan is the result of the effect this unique environment had upon them in their training. The gruelling 120 hour work week coupled with the exceptionally high patient volume in a career that spanned learning conventional surgical techniques to adopting newer methods such as endoscopy, minimal invasive spinal surgery and deep brain stimulation led to their success.

Risk to the Neurosurgeon

The next generation of neurosurgical residents are working in an environment where resources are skewed to a limited number of quaternary centres in major cities, these centres which should be providing 'super subspecialised' treatment to people out of their catchment are relied upon to provide general neurosurgical care not only for their own population but those further afield; something that should be provided by the neurosurgical departments in the so called 'peripheral' hospitals. The average work hour of current residents is 73 +/- 20 hours³ which is more than enough, given the high volume, to become proficient. The issue lies in the lack of standardization

in training and available facilities, particularly neurosurgery centres outside major cities have substandard equipment, lack basic resources such as access to textbooks, international neurosurgical journals and basic internet facility.^{4,5} Most centres lack microsurgical training suites, endoscopes and frameless neuronavigation.⁴ This is at worst a disservice not only to the neurosurgical trainees but the population of Pakistan.

The 'super subspecialist' is frail and history has proven this time and time again. H2 receptor antagonists decimated upper GI surgery, L-DOPA obliterated lesioning for tremor control in Parkinson's disease and more recently endovascular coiling shifted the paradigm in the treatment of aneurysms. My argument is that the future neurosurgeons of Pakistan need to be proficient in general neurosurgery whilst having sub speciality interests as I have noticed an impression within the residents that one must dedicate the majority of their practice in a subspecialty to excel in it. There is objective evidence to the contrary, one well controlled study demonstrated no difference in outcome of endovascular coiling carried out by a dedicated 'proceduralist' and between hybrid neurosurgeons who had a general neurosurgical practice but also carried out endovascular coiling⁶. Yet we all know about the 'super specialists' who advocate for cases within the realm of their subspecialty being exclusively operated on by them. They would approve restricting the practice of their general neurosurgical colleagues, but this ludicrous assertion must be proved and there is no objective evidence to support this notion. The most objective measure is, an outcome and there is no such literature that can back the claim touted. Neurosurgeons that have no post residency fellowship in a subspecialty and can objectively demonstrate their ability to be safe in performing such procedures should not have their practice restricted which I have seen being done unfortunately due to political reasons in many countries.

Risks to Patients

Pakistan needs to have a force of competent general neurosurgeons, for its population as the pathology we encounter in large numbers requires a generalist not a subspecialist. The main pathology in Pakistan is and foreseeably will be traumatic brain injury, unfortunately the community has turned a blind eye to such patients due to a perception of poor outcomes despite tremendous advances in the field of neurotraumatology, most neurosurgeons move away

from the management of neuro trauma patients once qualifying and the care of these patients is led predominately by residents. I have even heard of surgeons performing decompressive craniectomies without indication so as to not be bothered by ICP changes in the days to come whilst they operate on their private elective patients. In addition to TBI, much pathology present in an emergency setting and the persons most equipped to deal with them are the general neurosurgeons, not the 'super specialists' assuming the latter is available and not busy writing guidelines, revising manuscripts or preparing his/her next presentation. These aforementioned qualities are perceived to be hallmarks of a superior surgeon, but this is an axiom that is fallacious, unfortunately disagreeing with it may be seen as heresy. Given the glaring disparity between the neurosurgical centres my fear is that the future generation of neurosurgeons will be either that who is only equipped to excel in one subspecialty of neurosurgery or general neurosurgeons who are not adequately trained to practice general neurosurgery to a safe standard, independently.

Future Outlook

The subspecialist in today's era, especially in Pakistan is at risk of being made redundant by factors out of his/her control; spinal surgery and pain management for example have been poached by orthopaedics and anaesthetists, particularly in the private section. Neurosurgeons who intend to dedicate their whole career in these areas can be driven out of practice and if they have not maintained competency in general neurosurgery, it may mean having to retrain. Despite being a speciality known for its assertiveness and leadership, the community does not pay heed to this aforementioned issue due to their arrogance and assume any service that is neurosurgery led will be naturally superior. The current wave of subspecialization is driven by a mechanical mentality of 'bigger is better'.

It is worth mentioning the impact endovascular coiling has had upon neurosurgery within the UK. At the time of writing there is political pressure, which prevents neurosurgeons from practicing endovascular coiling in the UK. Some have gone further afield to learn the skill, but face problems with regards to referrals and reaccreditation when practicing in the UK. The change in paradigm has again impacted the most junior members of the profession. At my own parent institute: Department of Neurosurgery, Institute of Neurosciences, Queen Elizabeth University

Hospital Glasgow, University of Glasgow 2015 paper highlighted that before the International Subarachnoid Aneurysm Trial (ISAT), the unit received 150 aneurysms a year,⁷ a healthy number to train registrars and maintain proficiency. However, in 2015, total aneurysms operated were 25. These were challenging lesions that were unsuitable for coiling. This volume is not suitable to train the residents and neurosurgeon trained in today's environment where exposure to clipping is limited, will have poor results for such patients if they were managing these cases. It asserts my earlier reasoning for the need to be trained in general neurosurgical procedures and having the resources to do so particularly in our peripheral centres. In Pakistan the clips can be rapidly obtained, especially as time is of the essence in treating aneurysms, whereas coils are extortionately expensive and usually not acquired on time in public hospitals due to the need to first acquiring funds from charitable bodies. We risk not being able to provide the quality of care we owe to our patients outside of a select few centres because as older neurosurgeons retire or pass away the newer residents are not trained adequately in clipping; coiling is mostly interventional radiology led, when coiling fails the neurosurgeon has to clean the mess. This will be a problem for the next generation of neurosurgeons. Clipping aneurysms, which was once the hallmark of a neurosurgeon's manual dexterity is a skill that is unfortunately being eroded.

In the long term, this speciality may be so fragmented that consultants might only attend workshops and meetings related to their subspecialty, general meetings will decline and larger units will split rotas based on subspecialty which will adversely affect the neurosurgical patients in Pakistan as they do not always fall into a discrete category. This opinion piece is not against subspecialization or subspecialists rather a reminder of its implications on young neurosurgeons aspiring to limit their practice to one or two disciplines in Pakistan as they risk falling into the more satirical definition of a specialist; 'someone who knows more and more about less and less until they know everything about nothing'. Neurosurgery is the smallest surgical speciality it has always struggled to establish its place, it had done so through the decisive, driven and single minded individuals whom the field attracted naturally. Subspecialisation will split members of this small community and this may impact the political influence neurosurgeons have had to protect themselves from external threats which were combatted as a united society.

It is incumbent on the Pakistan Society of Neurosurgeons to support its members by having a system where general neurosurgeons and subspecialists work synergistically to provide the best care. Perhaps super subspecialists should only work in quaternary centres and maintain some level of general neurosurgical skill by assisting their fellow colleagues in cases or the society could recommend procedures all neurosurgeons should incorporate into their practice. We must upgrade the neurosurgical departments in the peripheral hospitals to the standard we have in major cities, these units have the responsibility of caring for those who are the most socioeconomically deprived. I would welcome an open debate from members of the community and their outlook in to what we can do to support each other.

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