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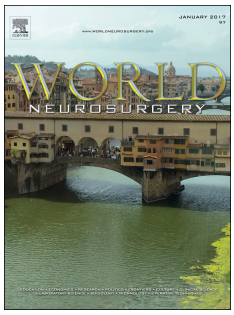

Neurosurgery in Countries with Limited Resources

Basant K. Misra

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There has been spectacular progress in neurosurgery in the world in the last four to five decades. While the development of neurosurgery and its availability to its citizens is more or less uniform in the high-income group (HIG) countries the major problem in middle and low-income group (MIG &LIG) countries is the lopsided distribution of the trained neurosurgeons and neurosurgical facilities. In my capacity as the President of the continental society, Asian Australsian Society of Neurological Surgery, AASNS, I had done a survey in 2017. While the ratio of neurosurgeons in the population in the developed nations like Japan, Australia and Singapore was more than sufficient, it was very inadequate and less than 1 neurosurgeon per million population in South Asian countries and also in China. Again, regional imbalance was reported from almost all the MIG & LIG countries. There is no doubt there are enough instances of the highest standards in neurosurgery and research from MIG & LIG countries.[1-4] Yet, in spite of the great advances in the field of neurosurgery there are major problems[5]: -

(a) variability of the quality of care across institutions,
(b) no defined minimum standard of care,
(c) long distance patient has to travel for treatment,
(d) inadequate follow-up and
(e) inadequate neuro-rehabilitation facility

For example, almost two thirds of Indian population reside in the rural area which has very few neurosurgeons. A study of all neurologists and neurosurgeons revealed that approximately 30% of the specialists reside in the big metros, capitals of states and Tier 2 cities each. Only 17.12% reside in the Tier 3 cities and 2.67% only reside in the rural areas, where the majority of Indians live. In fact, of the 550 districts in the country, only 200 have neurosurgeons. Innovative methods are being devised to tackle this problem. It has been found that it is technologically easier to develop telemedicine infrastructure than to develop neurosurgical infrastructure and manpower. The Health Department of the Government has linked 150 medical colleges with a high speed optical fiber network and is linking them to rural areas. So, remote tele-consultation is possible to triage patients and only transfer to referral centers those who need advanced neurosurgical work.

The increasing cost of neurosurgical care as well as the infrastructure cost has become a problem in resource limited countries. Poverty is still widespread and insurance coverage is very dismal, so affordability becomes an issue. One of the methods to ease some of the problems is optimal use of resources. It is thus desirable not to duplicate facilities and have a three-tier system.

(i) peripheral center,
(ii) standard neurosurgical care center and
(iii) tertiary referral center

It could thus be possible for everybody to have access to emergency neurosurgery at peripheral centers e.g., evacuation of extradural hematoma. Complex neurosurgical procedures can be referred to standard neurosurgical facilities e.g., excision of a complex brain tumor or clipping of an aneurysm. Patients requiring multidisciplinary