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Pediatric Neurology in India: Challenges and Opportunities

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EDITORIAL

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Pediatric neurology as super-specialty branch of paediatrics is currently in its infancy in India. With a pediatric population that constitutes nearly 40% of 1200 million people of India; the requirement and growth potential for pediatric neurologist is huge. Pediatric neurology is an art combining localisation based on knowledge of anatomy and physiology for making a correct diagnosis and management learned from traditional neurology and combining it with the process of normal maturation and development knowledge acquired from pediatrics.[1] Neonatal neurology, neurodevelopmental disorders, learning and communicative disorders are important aspect of this discipline.

Most of neurological disorders of pediatrics are being managed by pediatricians or adult neurologist in India, who have hardly any expertise and experience in dealing with these children. The post graduate pediatric residents have limited exposure to pediatric neurology during their training period. Recently over last few decades there is formalisation of pediatric neurologist training in India with few apex institutes have started pediatric neurology training programmes and few centres have established fellow ship programmes. This had led to increasing number of young pediatric post graduate residents with super specialization in this field. There is growing awareness and interest in this field in country as evidenced by increasing number of symposiums, meetings, workshops exclusively dedicated to pediatric neurology. Despite this the state of pediatric neurology in India is far from satisfactory.[2]

Burden of neurological disorder in childhood age group is enormous. This high magnitude of neurological problem is contributed by high prevalence of chronic neurological disorders like cerebral palsy, epilepsy, febrile seizures, autism, ADHD, learning disability, intellectual disability, and headache. Similarly CNS infections, traumatic brain injury, stroke, neurocysticercosis are common acute conditions as well as leading to long term sequelae. True burden of chronic neurodevelopmental disorders is not known in country due to lack of disease specific registry, epidemiological study and most of the data comes from hospital based studies.

In a recent community based study showed prevalence of epilepsy is 6.2/1000 population of 1-18 years age in Northern India, with a treatment gap of 25%.[3] Another study about prevalence of neurological disorder (Global development delay, epilepsy, hearing, vision, motor impairment) in community estimated a prevalence of 27.5 per 1000 population in age group 6 months-2 years. Another study from Banglore revealed the prevelance of chronic neurological disorder in children was 2635 per 100,000 population..[4] Over all the most prevalent diseases are headache, epilepsy, mental retardation, febrile convulsion, cerebrovascular disorders and mental retardation.[5] INCLEN study estimated a 7.5-18% prevalence of neurodevelopmental disorder in 2-9 years age group.[6] Epilepsy, neurodevelopmental disorders, CNS infections, cerebral palsy are the most common problems and these figures translates into a huge burden on existing health care and child neurologist.

Developmental disorders, cerebral palsy, autism, ADHD, intellectual disability, epilepsy and neuromuscular disorders; these are the conditions where direct role of pediatric neurologist is there right from diagnosis, investigations and rehabilitation. Pediatric neurologist have to led a team of persons from different subspecialty like psychology, physiotherapy, occupational therapist, social worker, neuropthalmology and speech and hearing unit, special educators for comprehensive management of these chronic and lifelong disorders. Rehabilitation and ongoing care is at most important for these children as with increasing age as they pose different challenges. Along with collaboration with local paediatrician and adult neurologist long term care and transition has to be carefully organised.

Epilepsy is an important aspect of pediatric neurology as most epilepsieshave their onset in infancy. Febrile convulsions, symptomatic epilepsy with neurocysticercosis and secondary to hypoxic ischemic encephalopathy are the commonest etiology in our country.[3] Neurocysticercosis is widely recognized as the commonest cause of acquired

epilepsy in tropical countries[7] and is a major economic burden in our country.[8] The disease has been known for ages, yet many controversies surround its diagnosis and particularly its management. Other devastating epileptic encephalopathies like west syndrome, Lennox gastaut syndrome, neonatal epileptic encephalopathies have adverse effect on neurodevelopmental outcome. With large population the number of patients with drug refractory epilepsies is tremendous, and pediatric neurologist should take this opportunity for optimum management and organising research in country. Similarly burden of inborn error of metabolism, neural tube defects, and intellectual disabilities is huge and need lot of clinical expertise and advanced investigations.

Acute neurological disorders and neurological complications of systemic disorders are another major field of work for pediatric neurologist. This is especially important in developing countries where burden of CNS infection is very high. With large population living in various viral encephalitis endemic areas; numbers of pediatric patients with viral encephalitis are huge. Other group is patients with CNS bacterial infection and their complication as complicated meningitis, tubercular meningitis, brain abscess, subdural empyema who require immediate management in alliance with neurocritial care units. Pediatric neurologists along with intensive care units have to manage raised intracranial pressure, complication and guide therapy. With advances in diagnostic, neuroimaging facilities, neuro-immunology, microbiology now it is much more feasible to diagnose acute disseminated encephalomyelitis, viral encephalitis, autoimmune encephalitis, cerebrovascular diseases, metabolic disorders, paraneoplastic disorders in pediatric patients. Acute management, management of complications and long term care of these patients should go hand in hand with other pediatric superspecialties.[2]

With advancing neonatal intensive care units, the survival rates of low birth weight babies, premature and sickest babies are increasing, however neurological monitoring and neurodevelopmental outcomes have not increasing with same pace. Neuroprotective strategies oriented neonatal intensive care units require high degree of technical and clinical expertise, sophisticated neuroimaging and electrophysiological investigations.[9] Management of hypoxic ischemic encephalopathy and neonatal seizures are areas with tremendous advancement in neonatal neuro-protection; eg.therapeutic hypothermia, newer therapeutic agents and advanced neuroimaging protocols such as magnetic resonance spectroscopy, fractional anisotropy, electrophysiological monitoring, regional perfusion monitoring. Pediatric neurologists in collaboration with neonatologist have to adopt “brain protection strategy” and management of acute issues as well as long term follow up of these patients.

There are many unexplored research areas in pediatric neurology in our country. Instance, tuberculous meningitis being an important problem, needed to have adequately designed and powered randomized controlled trials to guide optimum antitubercular regime and duration. There is need to have genetic research in important neurological conditions like infantile epilepsy, autism and intellectual disability.

To summarize, pediatric neurology have been emerged as an important and flourishing super-speciality of pediatrics. Now there are many challenges and opportunities ahead and young pediatric neurologists should face the challenges and seize the opportunities.

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