New Frontiers in Paediatric Neurology

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Citation: Rafay MF. New Frontiers in Paediatric Neurology [Online]. Annals ASH KM&DC 2018;23:.

Acute neurological presentations in children, in particular their varied aetiologies and challenging management, are the principal reasons for a chosen career in Paediatric Neurology. Childhood presentations with acute onset arm, leg and/or facial weakness encompasses a wide differential diagnosis. Historically, these children have been diagnosed as having "acute hemiplegia of childhood". During paediatric neurology training at a major hospital such as Hospital for Sick Children, Toronto, many children were diagnosed as having an ischaemic stroke, as in adults. Lack of knowledge and understanding regarding the occurrence of arterial ischaemic stroke (AIS) in children and the limited ability of CT scans to identify acute stroke were major contributors in the failure to recognise and diagnose AIS in children. During training, it is essential to work with experts related to the field of paediatric neurology e.g. paediatric stroke. Children with AIS have different aetiological and management considerations when compared with adults. Since the availability of Magnetic Resonance Imaging (MRI) techniques there is an improvement in the recognition and diagnosis of AIS in children. Newly emerging paediatric neurology subspecialty has grown enormously, with many centres across the world currently offering sub-speciality training. Over the last decade, an international network of paediatric stroke investigators has emerged with much interest in paediatric stroke research, the International Paediatric Stroke Study - IPSS.

Although uncommon in children, stroke is a major cause of long-term morbidity. In children, stroke ranks second, after brain tumours, among various childhood nervous system disorders. In developed countries, the annual incidence of childhood stroke ranges from 2.3 to 13 per 100,000 children per year[1-4]. Little data has been published from the developing and underdeveloped countries, including Pakistan. A review of published data indicates annual incidences ranging from 2.1 to 29.7 per 100,000 children per year for childhood stroke in developing and underdeveloped countries[5-9]. At least 60% of children with AIS have residual neurological deficits[2]. Although improved recognition and diagnosis has facilitated the care of children suffering from ischaemic stroke, timely accurate diagnosis continues to be a significant challenge[10]. Major challenges contributing to delays in stroke diagnosis include the infrequent nature of the disorder, poor awareness among health professionals and general public, and varied non-specific and subtle presentation symptoms in children. Presenting symptoms such as arm, leg and or facial weakness and speech problems, which in adults almost always indicate stroke diagnosis, are attributed to other more frequently noted neurological disorders in children, including ictal or postictal (Todd's) paralysis, focal seizure, complicated migraine and intracranial mass lesions (haemorrhage, demyelination, tumours, etc.), making it even more challenging to identify the disorder. A stark increase in the efforts to improve diagnosis and care of children presenting symptoms

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Date of Submission: 11th August 2017
Date of Acceptance: 5th March 2018

for stroke has been noted. Developed countries are moving forward in developing and implementing stroke screening and management protocols or "stroke codes" for paediatric patients, similar to adults[11]. Additionally, there is significant interest in conducting both clinical and bench research in this field.

Developing countries, however, have their own challenges. Paediatric neurology itself is not yet an established specialty in a majority of developing and underdeveloped countries, including Pakistan. Although efforts are underway, unfortunately these countries are currently at the stage where developed countries stood over two decades ago. Adequately trained medical staff is necessary for the optimal management of children with neurological disorders. Over half of paediatric patients present with neurological symptoms; including seizures, headache, encephalopathy, focal neurological deficits, abnormal movements and cognitive decline. Infectious and non-infectious meningoencephalitides and their associated complications, childhood epilepsies, intracranial mass lesions, migraine and neurodegenerative disorders are common neurological diagnoses in children. The current paediatric literature indicates geographic and ethnic differences in the presentation and aetiologies of certain neurological disorders[12]. Furthermore, some neurological disorders, mostly genetic and infectious, are frequently, or exclusively, seen in certain underdeveloped regions. Data from these countries will contribute immensely to the epidemiology of childhood neurological disorders. It is, therefore, imperative to gather efforts and interest in developing this important subspeciality in underdeveloped countries.

Over the last decade, Pakistan has taken small steps in recruiting and training paediatricians in the field of paediatric neurology. Notable organizations and individuals include the Aga Khan University Hospital, the only academic institute offering paediatric neurology sub-speciality training program in Karachi. In this regard, recently, a paediatric neurologist was awarded the Child Neurology Society 2016 Bernard D'Souza international fellowship award for his remarkable efforts[13]. As a result, he was able to attract the support of Child Neurology Society (CNS) and the International Child Neurology Association (ICNA) in facilitation of paediatric neurology training locally. Along with colleagues, we had recently organised a CNS/ICNA supported paediatric neurology symposium/workshop for both Karachi and Lahore in November 2017.

The establishment of a paediatric neurology subspeciality in Pakistan will immensely expand the region's ability to offer disease specific care for children with complex neurological disorders, which is currently in need of attention. Furthermore, this will allow numerous opportunities to conduct valuable systematic local research, thereby adding valuable information to existing paediatric neurology literature. Hence, data from underdeveloped countries will increase our ability to understand the epidemiology of many complex neurological disorders and will encourage physicians to facilitate the management of children suffering from these complex illnesses, based on their specific needs, across the world. For Pakistan, lack of qualified paediatric neurologists with the ability to appropriately train local paediatricians and generate financial resources for the development of a structured Paediatric Neurology program appear to be the current obstacles. Although Pakistan is lagging behind and has a long away to go, it has adequate child specialist manpower and resources to overcome the aforementioned obstacles. To facilitate establishment and maintenance of paediatric neurology as a subspeciality in Pakistan, the governing bodies of Pakistan's academic institutions must gather their efforts at a local as well as national level. Fortunately, International Child Neurology Association's recent interest in paediatric neurology teaching in Pakistan will be extremely helpful in facilitating this important endeavour. Many foreign trained Pakistani paediatric neurologists are willing to help and can be approached for their participation.

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