

# Editorial

## Neurodevelopmental disorders in children

Neurodevelopmental disorders, which are a major cause of morbidity in children, are increasingly recognized to cause great suffering for patients and their families as well as huge societal expenses.<sup>1</sup> The prevalence of childhood neurodevelopmental disorders poses a serious public health issue. These illnesses cover a broad spectrum of clinical entities with various etiologies and pathophysiology. Considering their complex etiologies and pathogenesis, there are arguments both in favor of and against the clinical utility of a pediatric approach that combines neurodevelopmental disorders like intellectual and language disorders with neurobehavioral disorders like attention deficit hyperactivity disorder (ADHD), neuro disabilities like cerebral palsy, epilepsy, autism spectrum disorder (ASD), and sensory processing disorders.<sup>2</sup>

Central nervous system development is impaired in neurodevelopmental disorders. Motor dysfunction, sensory audiovisual problems, or learning difficulties with verbal or nonverbal communication are all signs of developmental brain dysfunction. There is no fixed single cause of these delays or impairments, but a variety of factors may contribute to it by creating windows of opportunity for harmful impacts on normal neurodevelopment.<sup>3</sup> According to the WHO Classification of Function (2001), reversible “mild” grades of activity limits are referred to as “neurodevelopmental impairments” (NDIs), whereas irreversible “moderate” and “severe” impairments are referred to as “neurodevelopmental disabilities/disorders” (NDDs).<sup>4</sup>

The following six domains- gross motor, fine motor, vision, hearing, expressive/language, and cognition with behavior are typically used to categorize the neurodevelopmental functions of children. Although not a functional domain, seizures are frequently regarded as a sign of neurological dysfunction and may also be included. It was calculated that there were roughly 150 million disabled children under the age of 18 in the world.<sup>5</sup> In Bangladesh, estimates of the percentage of children with disabilities range from less than 1.41% of the overall population to 17.5%.<sup>6</sup> It is quite clear that despite several efforts to promote

health, the prevalence of NDD cases among our children is fluctuating and increasing.

Neurodevelopmental disorders are a group of complex multifactorial disorders with significant overlapping of symptoms that arise during the developmental period. Following is the broad classification of NDD in DSM 5 (The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition)<sup>7</sup>:

- Intellectual Disabilities
- Communication disorders (e.g., Speech, language)
- Autism spectrum disorder
- Attention-deficit/hyperactivity disorder
- Specific learning disorder
- Motor disorders
- Other specified neurodevelopmental disorder
- Unspecified neurodevelopmental disorder.

### Cause and consequences

The multitude of neurodevelopmental disorders spans a wide range of associated symptoms and severity, resulting in different degrees of mental, emotional, physical, and economic consequences for individuals, and in turn families, social groups, and society. Factors that can influence neurodevelopment in the preconception period are mostly genetic factors and other parental factors like parental age, maternal health, etc.<sup>7</sup> The factors that interfere during the gestational and perinatal periods can be intrinsic (feto-maternal factors) or extrinsic (e.g., infections, inflammations, toxins, trauma). These factors often trigger gene expression by different processes.<sup>7</sup>

In Bangladesh, although there are still no authentic statistics on the extent of the disabled and autistic population in Bangladesh, it is generally agreed that about 10% of the population is affected in one way or the other.<sup>8</sup> Among many types of disabilities, the number of physically disabled people constitutes about 2-5% of our population. According to this bench figure, it is estimated that there are millions of physically disabled people in Bangladesh today. To meet these challenges, Bangabandhu Sheikh Mujib Medical University started a ‘Child Development and Neurology

Service' as OPD in September 1999. In July 2010 PM Sheikh Hasina inaugurated the Centre for Neurodevelopment and Autism in Children (CNAC). CNAC is now known as the Institute of Pediatric Neurology and Autism (IPNA). Fifteen Child Development Centers(CDCs) were established in major government hospitals across Bangladesh and have recorded 208,866 patient visits.<sup>8</sup> At ICMH Saleh Child Development and Disability Centre (SCDDMC) manage children with a wide range of developmental problems like motor delay, mental retardation, speech delay, visual and hearing impairment, convulsion, etc. There is a strong team including a child neurologist, developmental specialist, and psychologist working with these developmentally backward children. The cases are followed up subsequently through this center.

Early identification of possible perinatal factors and providing a safe perinatal period can give a positive impact on the prevention of NDD in children.

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