Chapter 1
Analysis of Themes and Issues in Neurodevelopmental Disorders

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ABSTRACT

The study of neurodevelopmental disorders is beset with many issues and pitfalls. If its types are attempted to be explained at the molar developmental, environmental, and behavioral level, there is another explanation at the molecular brain or genetic level. The clinician can stumble into an error at any level while addressing these conditions. The origins and history of the neurodevelopmental model are followed in this chapter by sections on classification, theories, nature, types, and misperceptions. A lifespan approach, use of clinical reasoning, and decision making to sift critical signals from considerable noise during diagnosis are cautioned. The fears of making no diagnosis, patient’s perspective, evidence-based practice, and static versus dynamic diagnosis, cultural practices, and other related issues in Indian scene are addressed. Ongoing and unexplored areas like use of animal models, delay versus difference approach, and contemporary parenting practices are explained with a status report on available treatments and engagements to be undertaken in future.

INTRODUCTION

The typical story is about a single child born to a highly paid career-driven professional couple in their mid-thirties. They are married from the different language and cultural backgrounds. There is often a short stint abroad during the first two years of their child’s life with a huge mismatch between their native languages or culture to the foreign one. Often friendless in the foreign soil, save their weekend partying companions of Indian origin, they would have employed a babysitter to look after the child during the day. The toddler is kept engaged by the babysitter for feeding, dressing, watching television, or fiddling the latest versions of electronic gadgets. Opportunities for peer play outside their apartment are restricted if not absent. Either there is fear of infection or there are no similar aged kids from the
same ethnic background. Armed with this baggage of skewed and under-stimulated early childhood history, the child is back to India on a vacation only to discover his same-aged cousins are toilet trained, speaking fluently, or about to leave for a preschool. The grandparents, often belonging to a language different from the child’s mother, struggle to communicate with their grandchild given the different accent and poor English.

Shocked and surprised by the developmental lag in their child, the parents rush to seek a series of consultations. The professionals, on their part, consulting from their closed air-conditioned chambers instruct the parent to set the child free for that momentary observation. When left free, the ever hand-held child rushes around in excitement of the new environment. He does not respond to the doctor’s call for restraint much to the chagrin and felt shame or insult by the parents. Meanwhile, the doctor has already decided on the diagnosis for the child as ‘autism’ or ‘attention deficit hyperactivity disorder’. He prescribes medicines with tips on restricted diet, vitamin supplements, scans, EEG investigations, and yoga. Meanwhile, discussions begin at home to retain the child with grandparents in India while the working parents get back abroad with a promise to relocate at least one of them by resigning their job. The grandparents are left to begin the second journey of care giving the grandson. Having lost touch with such skills over the decades, a local helper is recruited. The child develops behavior issues which are perforce yielded, handled inconsistently, and attributed to his primary condition. The local preschools give admission to the toddler only to soon realise that he is lacking in social, play, communication and motor activities although ‘gifted’ in handling gadgetry. Thereafter, the tussle for rejection by the school and the plea for retention by the guardians begin.

The neurodevelopment framework is based on a synthesis of research from neuroscience, molecular or developmental genetics, neuroimaging, cognitive psychology, child and adolescent development, and related fields concerned about brain functions. It is to do with how these functions affect behavior and even their illness, disease, or disorder manifestations. Rapid advances in these disciplines over the last 2-3 decades have influenced the conceptualization of neurodevelopmental disorders (NDD). With a characteristic developmental perspective, the signs and symptoms of NDD are sought to be understood within the context of the brain growth trajectory. It uses the phenomena like gene mutations, unfolding genetic architecture, myelination, the influence of environment on genes (called epigenetics), and DNA methylation as core concerns to explain the molecular basis of NDD. This model posits that the illness is the end stage of the abnormal neurodevelopmental process that began years before the onset of the illness. For example, developmental insults as early as the first trimester can lead to the activation of pathologic neural circuits during adolescence leading to the emergence of positive or negative symptoms as schizophrenia (Fatemi & Folsom, 2009). Beginning from embryonic mal-development, there is assumed cortical mal-development with insults hitting during two critical time points once at early brain development and once again during adolescence (Keshavan, 1999).

**ETIOLOGY**

Given below is a short list of causes attributed to NDD:

- Evidence from brain pathology (enlargement of cerebro-vascular system, changes in gray and white matters and abnormal laminar organization);