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Review Paper

Cerebral Palsy in Children: A Clinical Review

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ABSTRACT

The concept of health as a balance between a person and the environment, the unity of soul and body. The Diagnostic and Statistical Manual of Mental Disorders (DSM) is the standard language used in the United States by physicians, researchers, and public health officials to communicate about mental disorders. Cerebral palsy (CP) is a neurological illness characterized by aberrant tone, posture, and movement. It is clinically categorized into four types based on the primary motor syndrome: spastic hemiplegia, spastic diplegia, spastic quadriplegia, and extra pyramidal or dyskinetic. The rate of CP is 2-3 per 1,000 live births. Prematurity and low birth-weight are key risk factors for CP; however, several other variables, including as maternal illnesses and multiple gestation, have been linked to an increased risk of CP. Treatment is a difficult problem, just as the clinical presentation and risk factors for CP. Rehabilitation facilities and schools should explore educating parents/caregivers to focus on their children's educational needs, promoting thoughts on the efficacy of practicing autonomy promotion tactics with their child, and encouraging their involvement.

Keywords: *Cerebral Palsy, Classification, Co-Morbidities, Extra Pyramidal, Epilepsy, Motor Type, Risk Factors, Spastic Hemiplegia, Spastic Quadriplegia*

"Healthy citizens are the greatest asset any country can have." – Winston Churchill.

Wellbeing

Well-being is a meaningful positive outcome for people and many sections of the society since it indicates that people believe their lives are going well. Good living situations (e.g., housing, employment) are key to wellbeing (44, 45). Well-being includes global appraisals of life satisfaction as well sentiments ranging from pessimism to joy. It comprises the presence of positive feelings and moods (e.g., contentment, happy), the absence of negative emotions (e.g., depression, anxiety), satisfaction with one's life, accomplishment, and positive functioning (5,138, 61). Well-being may be defined as a positive attitude toward life and a positive experience (40, 159). Physical well-being (e.g., feeling highly well and full of energy) is also seen as crucial to total well-being for public health considerations. Many of researchers have investigated various facets of well-being, including the following: physical well-being, economic well-being, social well-being,

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development and activity, emotional well-being, psychological well-being, life satisfaction, domain specific satisfaction and engaging activities and work (46, 56, 83, 80, 60, 41, 79, 47).

Health

Wholeness is a representation of the holistic view of health. In order to express the scope of one's individual potentialities within one's living environment, one must be in a condition of relative health in which they are able to operate effectively physically, psychologically, socially, and spiritually. Each person is situated on a continuum that varies from wellness and optimal functioning in all facets of life at one end to disease that results in dying at the other, as both health and illness are dynamic processes (87,152). Health merely means the absence of disease. According to the Ottawa Charter from the First International Conference on Health Promotion, held in Ottawa, Canada, in 1986, health is formed in the context of daily life and environment, in which people live, love, work, and play(110,125,153).The purpose of health promotion is to combine a strategy for managing socioeconomic determinants with the determination and commitment to motivate and encourage individuals and communities to take an active role in their health and to adopt healthy lifestyles (WHO, 1986).

The current understanding of health became official when the World Health Organization (WHO) included a definition of health in its Constitution when it was founded in 1948. Dr. Andrija Tampar, a famous Croatia academic in the field of social medicine and public health and one of the WHO's founding members, offered the concept. According to this widely accepted definition, "health is a condition of complete physical, mental, and social well-being and not only the absence of disease or disability" (WHO, 1948).

With the establishment of the WHO Global Strategy "Health for All by the Year 2000" in 1977, an indirect acceptance of a pragmatic understanding of health - the ability to lead a socially and economically productive life - was made (WHO, 1998). Health experiences are more subjective and ambiguous than disease ones, making the former far harder to examine.

Models of Health

The medical model regards the body as a machine that must be repaired when it breaks. It focuses on treating specific physical ailments, does not address mental or social issues properly, and, because it is preoccupied with curing health issues, de-emphasizes prevention. This logically leads to gauging health in terms of disease or death rates. As a result, health is defined as the absence of sickness combined with high levels of function. A (rather wordy) example would be: A (rather wordy) example would be: “anatomic, physiological, and psychological integrity; ability to perform personally valued family, work, and community duties; ability to deal with physical, biological, psychological, and social stress" (148).

The holistic model of health was exemplified by the 1947 WHO definition” condition of complete physical, mental and social well-being and not only the absence of disease or infirmity,"

This paradigm expanded the scope of the medical model and also included the concept of positive health (although the WHO did not originally use that term). The WHO definition was long thought to be unmeasurable because concepts such as well-being were deemed too ambiguous. This was less because no one could devise methods to quantify them (in fact, psychologists had), and more because doing so required subjective judgments’ that clashed

dramatically with the objective indications supported by the medical model. His arguments about what role patients should play in determining their own health represented traditional (paternalistic) and more contemporary (patient-centered) medical approaches. When applied to a population, the holistic model would either total relevant individual indicators or record measurements of overall population well-being.

The wellness model was championed by the WHO health promotion initiative.
A WHO discussion document from 1984 recommended shifting from viewing health as a state to a dynamic model that portrayed it as a process or a force in the 1986 Ottawa Charter for Health Promotion emphasized this and based on the definition of health, "the ability of an individual or community to fulfill objectives and meet needs, as well as alter or cope with their surroundings. Health is a resource for daily life, not a goal in and of itself; it is a positive term that promotes social and personal resources, as well as physical capacities (*Health promotion: a discussion document*. Copenhagen, WHO, 1984).

Some definitions of health focus on resiliency (for example, "the ability of individuals, families, groups, and communities to cope well in the face of considerable adversity or risk", when applied to population health, the concept could include characteristics such as the population's ability to adjust to change, such as shifting economic realities or natural calamities (154).
An ecological definition is "a situation in which people and other living species with which they interact may coexist indefinitely." (Last, *Dictionary of epidemiology*. IEA, 1995).

Social model
This type of model arose from the disability rights movement's strong support for the social model of disability. It evolved in response to the traditional medical model. The social model of health looks at all of the elements that influence health, including social, cultural, political, and environmental aspects. It is commonly known that both stress and low self-esteem can be harmful to one's health. Low levels of autonomy and self-esteem are more likely to be associated with poor health; CDHN believes that communities are aware that a variety of factors are affecting their health. We also believe that communities may and should play an active role in finding, planning, creating, and implementing solutions to health problems and disparities (104).

Bio-psychosocial model
Bio-psychosocial model was developed by psychiatrist George Engel in 1977; it recognizes that numerous factors influencing health. It pays "explicit attention to humanness". It regards health as both a scientific construct and a social phenomenon. The model examines biological elements that influence health, such as age, sickness, gender, and so on, individual beliefs and perceptions are two psychological aspects to consider. The social: the presence or lack of relationships in the community "When our interpersonal relationships are severed, we suffer, and when they are repaired, we find solace" (51).

Salutogenic model: Antonovsky, a sociologist, developed and focuses on how and why we stay well. This model contributes to a better understanding of the link between stressors, coping and health.

Ecosystem model: Humanity is a part of and one among many in an environment that is changing due to human activity: land use, climate change, population increase, resource depletion, pollution, urbanization, biodiversity loss, and other local and global processes all

disrupt the biosphere's natural self-regulation. These changes are detrimental to humans, domestic animals, wildlife, the oceans, and the forests. The critical response must be to rethink our interactions with the rest of nature (95).

DSM

The Diagnostic and Statistical Manual of Mental Disorders (DSM) is the standard language used by physicians, researchers, and public health officials in the United States to convey about mental disorders. The fifth revision (DSM-5) (APA, 2013) of the DSM was published in May 2013, representing the first fundamental redesign of diagnostic criteria and classification since the DSM-IV in 1994 (APA, 1994).

Historically, the World Health Organization (WHO) had its own mental disorder categorization system in Chapter V of the International Classification of Diseases (ICD), which was primarily used for compensation and collecting national and international health data. However, following a 1982 international conference on mental disorder classification in Copenhagen (Jablensky, 1980) , there was widespread agreement for the ICD to adopt more detailed diagnostic criteria to identify mental diseases that adhered to the DSM-III 1980 paradigm (APA, 1980). A decade of collaboration occurred between the American Psychiatric Association (APA) writers of the DSM-IV and the World Health Organization (WHO) developers of the ICD-10, which was aided by a cooperative agreement between the National Institute of Mental Health and the WHO.

Although the official ICD-10 (WHO, 1992) only provides a brief description of each disorder, the WHO Division of Mental Health came to an agreement with the APA to publish Diagnostic Criteria for Research (WHO, 1993) and more general Clinical Descriptions and Diagnostic Guidelines (WHO, 1993) as part of the ICD-10 Classification of Mental and Behavioral Disorders. Having similar but distinct research criteria resulted in a significant international convergence of clinical practice communication and research on mental disorders - despite the apparent minor differences in research diagnostic criteria producing some differences in prevalence rates and correlates of mental disorders (5, 58). Based on this expertise, the most recent DSM-5 and ICD-11 development processes provided an additional opportunity to not only advance the field in terms of diagnostic utility and validity, but also to increase compatibility with ICD-11 clinical guidelines and the global psychiatric community at large.

DSM 5

DSM-5 Table of Contents

Neurodevelopmental Disorders	**Sexual Dysfunctions**
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Intellectual disability	Erectile Disorder
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Attention-Deficit/Hyperactivity Disorder	Dysfunction
ADHD	
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Motor disorders	
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Stereotypic Movement Disorder	

Tic Disorders Tourette's Disorder Persistent (Chronic) Motor or Vocal Tic Disorder Provisional Tic Disorder Other Neurodevelopmental Disorders Other specified Neurodevelopmental Disorder Unspecified Neurodevelopmental Disorder	
Schizophrenia Spectrum and Other Psychotic Disorders Schizotypal (Personality) Disorder Delusional Disorder Brief Psychotic Disorder Schizophreniform Disorder Schizophrenia Schizoaffective Disorder Substance/Medication-Induced Psychotic Disorder Psychotic Disorder Due to Another Medical Condition **Catatonia** Catatonia Associated with Another Mental Disorder Catatonia Disorder Due to Another Medical Cond. Unspecified Catatonia	**Gender Dysphoria** Gender Dysphoria
Bipolar and Related Disorders Bipolar I Disorder Bipolar II Disorder Cyclothymic Disorder Substance/Medication-Induced Bipolar and Related Bipolar and Related Disorder Due to Another Medical	**Disruptive, Impulse-Control, and Conduct Disorders** Oppositional Defiant Disorder Intermittent Explosive Disorder Conduct Disorder Antisocial Personality Disorder Pyromania Kleptomania
Depressive Disorders Disruptive Mood Dysregulation Disorder Major Depressive Disorder, Single & Recurrent Episodes Persistent Depressive Disorder (Dysthymia) Premenstrual Dysphoric Disorder Substance/Medication Induced Depressive Disorder Depressive Disorder Due to Another Medical Cond.	**Substance-Related and Addictive Disorders** **Substance-Related Disorders** Substance Use Disorders Substance-Induced Disorders Substance Intoxication and Withdrawal Substance/Medication-Induced Mental Disorders Alcohol-Related Disorders Caffeine-Related Disorders Cannabis-Related Disorders Hallucinogen-Related Disorders Inhalant-Related Disorders Opioid-Related Disorders Sedative-, Hypnotic-, or Anxiolytic-Related Disorders Stimulant-Related Disorders Tobacco-Related Disorders Other (or Unknown) Substance-Related Disorder Non-Substance-Related Disorders Gambling Disorder
Anxiety Disorders Separation Anxiety Disorder Selective Mutism Specific Phobia Social Anxiety Disorder (Social Phobia) Panic Disorder Panic Attack (Specifier) Agoraphobia Generalized Anxiety Disorder Substance/Medication Induced Anxiety Disorder	**Neurocognitive Disorders** Delirium **Major and Mild Neurocognitive (NC) Disorders** Major/Mild Neurocognitive Disorders Major/Mild NC Disorder Due to Alzheimer's Disease Major/Mild Frontotemporal NC Disorder Major/Mild NC Disorder With Lewy Bodies Major/Mild Vascular NC Disorder

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Trauma-and Stresssor-Related Disorders Reactive Attachment Disorder Disinhibited Social Engagement Disorder Posttraumatic Stress Disorder Acute Stress Disorder Adjustment Disorders	**Other Mental Disorders** Other Specified Mental Disorder Due to Another Medical Condition Unspecified Mental Disorder Due to Another Medical Condition
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Somatic Symptom and Related Disorders Somatic Symptom Disorder Illness Anxiety Disorder Conversion Disorder Psychological Factors Affecting Other Medical Conditions Factitious Disorder	Other Conditions That May Be a Focus of Clinical Attention
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Breathing-Related Sleep Disorders Obstructive Sleep Apnea Hypopnea	

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Neurodevelopment Disorders (NDDs)

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association, 2013) included a brand-new diagnostic category known as neurodevelopmental disorders (NDDs), that are a group of disorders that commonly begin in childhood and can be ailments that last a lifetime. This new approach is fully committed to including NDDs in a heterogeneous and dimensional group, abandoning the categorical classifications of the DSM 4th Edition Text Revision (DSM-IV-TR; American Psychiatric Association, 2004) and the International Statistical Classification of Diseases and Related Health Problems (ISCD-RHP) (ICD-10; World Health Organization, 1992). The upcoming ICD version (ICD-11) is expected to align its criteria with those of the DSM-5 (2013).

As previously stated, NDDs include disorders that manifest in almost all developmental domains in a general way, such as intellectual disability (ID), as well as those that affect more specific domains, such as attention-deficit/hyperactivity disorder (ADHD), autistic spectrum disorder (ASD), communication disorders (CD), specific learning disorder (SLD, including difficulties in reading, writing, and mathematics), and motor disorders (MDs, such as Tics, Tourette's and stereotypic disorders). Visual impairment, epilepsy, neuromotor disability (including cerebral palsy), hearing impairment, speech and language problems, ASD, and ID are all prevalent of NDDs (7).

Cerebral Palsy

Cerebral palsy (CP) is a category of non-progressive brain and nervous system illnesses. It has an effect on the child's movement, visual, learning, and cognitive processes (73). It can happen before, during, or during the first year of childbirth and occurs as a result of brain damage and anomalies, which can manifest two years after birth (53). It arises in some children as a result of cerebral hypoxia, and premature infants are more likely to acquire CP (107,123). The reported incidence of CP is 1.5 to 2.5 per 1000 childbirth, and these rates were increased between 1960 and 1980. Data now show that 0.5 per 1000 childbirths occur (52). Diplegic CP has a 95% survival probability compared to 75% for quadriplegic youngsters up to the age of 30. Mild to severe mental retardation survival rates have been reported as 65% and 90%, respectively, until the age of 38 years, with an overall survival rate of 90% till the age of 20 years (147).

CP is the second most prevalent condition that causes disabilities in child growth, behind mental retardation, but it also affects adults due to a lack of appropriate training among primary care physicians and specialists for treating children with developmental abnormalities (122). The symptoms of CP differ depending on the presentation; it can range from mild to severe, affecting one side or the entire body (8). Increased study is being

conducted to better understand the hormonal, infectious, and genetic aspects that contribute to premature births of babies delivered by the mother (111,141).
The prevalence of CP in all live births ranges from 1.5 to 3 per 1,000 live births, with differences across rich and low to moderate income nations and geographic locations. Many toddlers and children's defective neuromotor findings resolve within the first few years of life, especially during the first 2-5 years of life, when the stated prevalence of CP is highest, despite of this prematurity and low birth weight are major risk factors for CP, a variety of other factors are also related with or may enhance the risk of CP and many of observational studies estimate that half of the children who acquire CP were born at term with no identifiable risk factors (93,29,62,113,150,69,102,75,76,86). However, CP proved to be more widespread in low- and middle-income nations than in high-income countries, with this CP prevalence ranging from 3.6 to 2.9 cases per 1000 children in Uganda and Egypt, respectively, 1.8 to 2.3 occurrences per 1000 children in the United States, Europe, and Australia (81, 134, 48).

In India, the prevalence of CP has been predicted to be 3 cases per 1000 live births; however, India is a developing country, the actual figure may be greater than the probable one, as recent statistical data shows that there are approximately 25 lakh CP children in India (76). Following the abolition of polio, cerebral palsy has become one of the leading causes of childhood disability (37). CP is a chronic neurological condition that affects the family in both psychological and social ways, putting a significant strain on the National Health System. The treatment and rehabilitation of CP require the collaboration of medical and rehabilitation teams (12,139). Several studies have shown that prenatal and perinatal events cause around 75% of all occurrences of CP. Furthermore, some risk factors, including as prematurity, low birth weight, birth asphyxia, neonatal jaundice, epilepsy, maternal infections, perinatal adverse events, placental anomalies, multiple gestations, and so on, play an important part in the development of CP. Prenatal risk factors appear to account for roughly 75% of all CP instances, while newborn and neonatal period risk factors account for 10% to 18% of all CP cases (149, 148,105, 59).

Four functional classification systems are utilized in people with CP to provide a systematic approach of assessing the individual's support and therapy needs. The Gross Motor Function Classification System (GMFCS) is used to describe gross motor function, particularly the ability to walk, in children aged 2 to 18. GMFCS refers to both self-initiated movements and movements aided by equipment such as walkers, crutches, canes, or wheelchairs. The Manual Ability Classification System (MACS) describes the typical usage of both hands and upper extremities in children aged 4 to 18. The Communication Function Classification System (CFCS) is used to describe people with CP's ability to communicate in daily life (sending or receiving messages). The CFCS considers all modes of communication, including vocalisations, physical signs, eye gaze, graphics, communication boards, and voice producing equipment. The Eating and Drinking Ability Classification System (EDACS) is used to describe the eating and drinking function in children aged 3 and up. The EDACS evaluates eating and drinking safety (risk of aspiration or choking) as well as eating and drinking efficiency (the amount food lost and the time taken to eat) (119, 49, 136, and 68,142,126).

CP is distinguished by variation in risk factors, underlying particular etiology, clinical symptoms, severity of functional limits, associated and secondary problems, treatment options, and progression of the condition across the individual's lifetime and the case for considering CP as a spectrum disease rather than a distinct unitary clinical state (Patel et al.,

2010, Stavsky et al., 2017 & Novak et al.,2017). Factors linked to a higher risk of CP Congenital brain abnormalities Genetic susceptibility Hypoxic-ischemic encephalopathy stroke in utero or perinatal stroke In vitro fertilization or the use of assisted reproductive technology Kernicterus low birth-weight, clotting problems in mothers Infections transmitted from mother to foetus Multiple pregnancies seizures in infants neonatal sepsis or meningitis postnatal meningitis TBI after birth obesity prior to pregnancy preterm birth cerebral palsy (Shevell, 2019).

History

As early as the 1800s, when the first cases of CP were described, William Little. William Little argued for the earliest feasible diagnosis in order to encourage beneficial treatment of the illnesses when diagnosed in the early stages" made the case for early diagnosis in order to "encourage successful treatment of illnesses when diagnosed in the early stages (93). In the mid-twentieth century, Dr. Jean Macnamara, an Australian female voice, questioned if CP was being diagnosed as early as possible: "Are we doing everything necessary to ensure that a kid with cerebral palsy is recognised in the first few months of life? We should require that medical students be given capabilities to diagnose cerebral palsy in babies, and that health visitors be educated how to spot the indicators before deformity develops" (96). Until the 1970s, the concept of early CP diagnosis in toddlers was not thoroughly investigated (50). The concept of the "unseen handicap" (1) or "latent or quiet" phase (Novak et al., 2017) predominated at this time in history. At the time, it was thought that CP symptoms could not be detected in the first 12 months of life. Indeed, it was well acknowledged and emphasized to professionals that CP might and should not be adequately diagnosed until the age of 3-5 years. During the 1970s and 1980s, the term risk and risk factors for CP was developed to determine which infants should be monitored through the neurologically "silent" phase. The urge for early diagnosis and access to early intervention was raised once more. "It is now universally accepted that the earliest possible diagnosis and treatment are essential in order to prevent, or at least minimize, the handicapping effects of a disability and to make the most of the assets a child possesses, it may be important to identify children who are at substantial risk of CP as early as possible, because therapeutic intervention may offer the best chance of achieving maximal benefit (1, 50). In the 1970s, abnormally maintained primitive reflexes were thought to be a valuable clinical sign for CP (31, 97). Also, cranial ultrasound (CUS) began to be utilized in newborn intensive care units to diagnose brain lesions (121, 38). Since the 1980s, researchers have been studying how neuroimaging modalities, such as magnetic resonance imaging (MRI), might be used to predict CP (De Vries, 2014). The American Academy of Neurology recommended MRI as a diagnostic technique for CP in 2004 (8). The introduction of the general movements assessment (GMA), an examination of an infant's spontaneous movement, was arguably the most significant step in the accuracy of predicting CP and in changing the assumption that newborns with CP are neurologically silent in the first few months of life (131,132,47). The GMA was initially characterised in the 1990s, after decades of progress in understanding of early spontaneous movements (133). The Hammersmith Infant Neurological Test (HINE), a standardised neurological examination, was also designed in the 1990s (67). The seminal article Cerebral Palsy—Don't Delay, published in 2011, began to bring these techniques together into one body of knowledge. GRADE (66) evaluated clinical approaches to get an early diagnosis of CP in this paper (98)

Classifications motor types of cerebral palsy are (Graham et al., 2016):

- Spastic diplegic: The patient has stiffness and motor problems that mostly impact the legs rather than the arms.

- Spastic hemiplegic: The patient has stiffness and motor problems on one side of the body; the arms are frequently more engaged than the legs.
- Spastic quadriplegic: The patient has spasticity and motor problems affecting all four extremities; the upper extremities are frequently more involved than the legs.
- Dyskinetic/hyperkinetic (choreoathetoid): The patient experiences excessive, involuntary movements that include quick, dance-like muscle contractions and sluggish writhing movements.
- Dystonic: Involuntary, continuous muscle contractions cause twisting and repeated movements in the patient.
- Ataxic: The patient is unsteady and uncoordinated, and they are frequently hypotonic.

Etiology

Cerebral palsy is caused by abnormal brain development or injury to the foetal or infant brain. The non-progressive ("static") brain insult/injury that causes CP can occur during the prenatal, perinatal, or postnatal periods. Individual patient aetiology is frequently complex and Prematurity increases the chance of cerebral palsy. Prematurity complications that can lead to cerebral palsy include (Nelson, 2008) (100):

Prenatal Causes: Congenital brain defects, Intrauterine infections, Intrauterine stroke and chromosomal abnormalities

Perinatal Causes: Hypoxic-ischemic insults, Infections of the central nervous system (CNS), Stroke and Kernicterus

Postnatal Causes: Trauma, both accidental and unintentional, CNS infections, Stroke and Anoxic insults

Periventricular leukomalacia

Intraventricular hemorrhage

Periventricular infarcts

Multiple gestation, intrauterine growth restriction, maternal substance misuse, preeclampsia, chorioamnionitis, aberrant placental pathology, meconium aspiration, neonatal hypoglycemia, and genetic predisposition are all risk factors for cerebral palsy (McMichael et al., 2015 & McMichael et al., 2018).

REVIEW OF LITERATURE

Early diagnosis to optimise long term functional outcomes on the basis of positively modulating their impact on neuroplasticity. CP is possible based on a combination of findings from medical history, neuroimaging, and standardised individually administered neurological and motor assessment tools (Novak et al., 2017). Cerebral palsy is connected with a number of co morbidities, including visual impairment, epilepsy, cognitive impairment, sensory abnormalities, communication, perception, and behavioural disorders (21). Comorbidities are key drivers of outcome and quality of life in many children with cerebral palsy (Shevel, 2009). The Reference and Training Manual of the Surveillance of Cerebral Palsy in Europe (SCPE) divides cerebral palsy into three groups based on motor deficit: spastic type, dyskinetic, or ataxic, with dyskinesia being further broken down into choreoathetosis and dystonia, it is important to note that many children have mixed presentations (26). It is becoming more and more clear that numerous risk factors might interact to cause CP and Its multifaceted, heterogeneous origin is marked by damage to the developing brain, it's common for no clear cause to be detected (MacLennan et al., 2015). During the prenatal, natal, and postnatal phases, numerous risk factors are discovered, such as multiple births, intrauterine infection, preterm, perinatal stroke, birth hypoxia, perinatal

infection, placental pathology, and congenital deformities (104,102,14). Movement abnormalities such as rigidity, hypotonia, dystonia (such as athetosis), or a combination of these can coexist with clinical patterns (39). It was extremely challenging to get precise diagnosis processes for diplegia, quadriplegia, and hemiplegia for clinical processing. In a study conducted in France by Bleck, the distribution of clinical patterns was determined, and the results showed that 40% of children had quadriplegia, 17% had diplegia, and 21% had hemiplegia (15).

For the most part, clinical results were used to choose CP as the child's spasticity treatment strategy. Some of the characteristics that were necessary for the treatment of musculoskeletal problems included spasticity, muscle stiffness, muscular contracture, dynamic and static joint deformities, torsional deformities, and impaired motor control. One of the fundamental treatments for spasticity was the use of a continuum of modalities throughout infancy; the majority of youngsters appeared to receive treatment using a mix of modalities. The effectiveness of moderate medication doses used orally for the treatment of spasticity was examined. It was determined that the intramuscular injection of botulinum toxin was utilised to treating focal spasticity. If the injection was combined with physiotherapy and orthotics, its impact might be enhanced (137, 64 and117).

Most of the children with CP received physiotherapy, occupational therapy, and/or speech therapy. There is insufficient research to back up or contradict their use in the treatment of CP (61, 22-23). Physiotherapy and occupational therapy provided the greatest benefits and were crucial components of successful medical and surgical intervention (Palmer et al., 1988). Muscle strengthening has been linked to increased function in children with cerebral palsy (35). Strength training has been promoted as a means of improving fitness and increasing children's engagement in a variety of recreational and occupational activities. Physiotherapy and occupational therapy approaches encompass a diverse set of techniques and schools, including basic neurodevelopmental therapy procedures (16) and constraint-induced movement (27).

The main clinical pattern and motor deficits of patients, as well as the presence of risk factors and whether there is a relationship to the kind of cerebral palsy. Caregiver interviews, a study of medical records, and a direct physical examination were used to assess cerebral palsy risk factors and motor deficits. A total of 1000 children with cerebral palsy were enrolled. The subjects were 64.4% male, with a median age of 2.5 years. he risk factors for cerebral palsy were prenatal (21%), natal and post-natal (30.5%), postneonatal (17.1%), and unidentified (31.4%). Antenatal CNS malformation (26.6%), maternal diabetes (17.6%), protracted rupture of membrane (11.9%), maternal haemorrhage (10.4%), and pre-eclampsia (4.7%). As hypoxic ischemic encephalopathy (28.5%), infection (16.3%), hyperbilirubinemia (12.7%), cerebrovascular accidents (8.8%), meconium aspiration (6.2%), and cerebral haemorrhage. CNS infection (34.5%), cerebrovascular accidents (28.6%), sepsis (23.9%), and intracranial haemorrhage (8.7%). Cerebral palsy has several aetiologies and risk factors (Elmagid & Magdy, 2021). CP is caused by a damage to the foetal or neonatal brain, postneonatal onset CP has been identified. Postneonatal CP is caused by a brain damage after birth but before the age of five National Institute for Health and Care Excellence (UK), (107, 101 and 74)

Current State of Early Diagnosis of CP Globally

Despite long-standing calls for early CP diagnosis, diagnosis still occurs very late. Currently, in Australia, only 21% of newborns are diagnosed before 6 months of age, and

52% are diagnosed after one year of age (Australian Cerebral Palsy Register Report 2018). Early detection enables access to CP-specific early therapy. We recognise that there is currently no cure for CP and that false hope should not be spread, but we believe that additional research is needed to uncover paradigm-shifting treatments. Preventative treatments have been found and applied in the recent decade, with significant population effects. These population trends suggest that adjustments in preventative neonatal care are effective and that additional research is warranted. In the future, there may be further evidence of the protective effects of neuroprotective and neurodegenerative treatments, including stem cell treatments (57). Early diagnosis also allows for proper psychological help for parents. It has been claimed that most parents suspect CP before receiving a diagnosis (10), and all parents in one qualitative study regarded early detection useful (24). Empirical data shows that parental therapies (such as Acceptance and Commitment Therapy) promote psychological adjustment in parents of older children (160). Its efficacy is now being proven in parents of infants under the age of two. It is expected that early support for parents of infants with CP will be protective because home-based parent support after preterm birth conferred reduced rates of parental anxiety (odds ratio (OR): 0.28, 95% CI 0.11-0.71) and depression (OR: 0.27, 95% CI 0.08-0.93). It is widely established (136, 98 and 11). It is still believed that CP is a clinical description rather than an etiologic diagnosis. (99). As a result, no biomarkers for the diagnosis of CP exist, which has long been a hurdle to early diagnosis. An international clinical guideline on methods for the early, accurate identification of CP was issued in 2017 (Novak, 2017). CP can frequently be effectively diagnosed at the age of six months, and even as early as three months corrected age, by combining diagnostic techniques with high predictive validity and clinical reasoning. A diagnosis at the age of six months is substantially younger than the reported typical age of diagnosis in high-income nations, which is 12-24 months. (1) GMA (sensitivity 98% (95% CI 74%-100%); specificity 91% (95% CI 83%-93%) at fidgety age (21), (2) MRI at term equivalent age (sensitivity 86%-100%, specificity 89%-97% and (3) HINE (sensitivity at 3 months 96%, specificity 85%) (135). The usage of CUS in a Danish population has been demonstrated to be one factor that reduces the age of diagnosis (8.4 months with CUS versus 13.2 months without CUS, p 0.001) (63). Accurate diagnosis using evidence-based techniques is still achievable beyond five months of age, when the GMA cannot be consistently scored, and evidence-based diagnostic paths exist (Novak, 2017). This approach is critical because half of children with CP do not have neonatal identifiable concerns such as preterm and frequently miss the window in which GMA can be completed. (98). One constraint to early diagnosis is the fear of giving a false positive diagnosis in the case of a normal result or another explanation. At 5 years of age, less than 5% of suspected cases are identified as not having CP, per the population data (Australian Cerebral Palsy Register Report 2018). If a toddler fits the parameters of CP, the diagnosis of CP can and should be made in conjunction with other diagnoses (99,145). Nelson first presented the notion of "outgrowing CP" in the 1980s (Nelson et al., 1982). A lack of perinatal adverse events (odds ratio (OR) 4.1, 95% CI 1.6-10.7) and normal MRI findings (OR 7.8, 95% CI3.8-16.1) have been described as more likely to occur in infants who do not match criteria for CP at age 5 years after a previous diagnosis (28).

Treatment of cp

The neurophysiological and orthopaedic systems have been enhanced by various motor learning approaches (43).

Muscle education and braces

W.M. Phelps, an orthopedic surgeon in Baltimore, USA, was a cerebral palsy pioneer who promoted physiotherapists, occupational therapists, and speech therapists to build cerebral palsy habilitation teams (128,144). The following were the key points of his therapeutic strategy:
Diagnostic classification that is specific. Specific treatment strategies were based on each child's form of cerebral palsy. Phelps identified five categories. Massage and passive, aggressive, and resistant movements are examples. Damiano (2007) cites Phelps when she verifies the value of resisted motion for strengthening, citing her studies (35, 36). The relaxation techniques used included deliberate 'letting go' of the body and its parts, as well as tensing and relaxing body parts (89).

Progressive pattern movements
Temple Fay, a neurosurgeon in Philadelphia, suggested that children be taught motion in the order that it evolved. Human ontogenetic development as a recapitulation of evolutionary development (in the evolution of the species). In general, he proposed progressing from reptilian rolling to amphibian creeping, then to mammalian reciprocal motion 'on all fours' and finally to primate erects walking. Because these early movements of progression were performed with a rudimentary nervous system, they can be performed in the human in the absence of a normal cerebral cortex to activate malfunctioning areas of the body. Fay also mentioned 'unlocking reflexes' that help with hypertonus. He created progressive pattern motions based on these principles (54, 55).

Proprioceptive neuromuscular facilitations (PNF)
Margaret Knott and Dorothy Voss, he developed a series of movement facilitation techniques for reducing hypertonus, strengthening, coordination, and enhancing joint range of motion Movement patterns based on patterns identified during functional tasks such as dressing, walking, playing tennis, golf, or football. These patterns are spiral (rotational) and diagonal, with a muscle group synergy or chain. Isolated muscle teaching was not used since a movement pattern could activate a muscle group within a chain of muscles. The movement patterns are not the' mass movements' found after brain trauma, but rather functionally generated patterns. They are made up of the following simultaneously active components in the hips, knees, and feet, or in the shoulders, elbows, wrists, and hands: 1. flexion or extension 2. abduction or adduction 3. Internal or exterior rotation (77, 82,155).

Neurodevelopmental treatment (NDT) (Bobath approach)
Karl Bobath, a neuropsychiatrist, and Berta Bobath, a physiotherapist, based their assessment and therapy on the idea that the primary difficulty in cerebral palsy is a lack of inhibition of reflex patterns of posture and movement (17,18,19). The Bobaths related these unusual patterns with inappropriate tone caused by tonic reflex overactivity. To counteract 'the abnormal patterns of released postural reflex activity and at the same time facilitate normal reactions by special techniques of handling,' tonic reflexes such as the tonic labyrinthine reflex, symmetrical tonic neck reflexes, and asymmetrical tonic neck reflexes had to be inhibited. Neurodevelopmental treatment (NDT) was less successful than a comprehensive developmental programme (118). The 'preponderance of results did not give any advantage to NDT over the alternatives to which it was compared' in their NDT review for the American Academy for Cerebral Palsy and Developmental Medicine (AACPDM) (23). Brown and Burns (2001) reviewed 147 papers, just 17 of which met scientific requirements. Today, the Bobath method or NDT is practised differently in different countries, portions of countries, and centres. Physiotherapists have had to make changes based on clinical experience and critical feedback from others. As scientific understanding

of the brain and nervous system grows, a number of therapists and other workers have questioned the Bobath method's assumptions and concepts (91,65,71,33).

Reflex creeping and other reflex reactions

Vaclav Vojta, a neurologist who worked in Czechoslovakia and Germany, based his method on the writings of Temple Fay and Kabat-Zinn (156-158). He employed a list of postural reflexes as a measure of diagnosis and results, which Norén and Franzén did not accept (1982). Reflex creeping and rolling are present in infants but persist in cerebral palsy. They can be utilised and modified by hand for postural development and associated movements.

DISCUSSION

Since William Little's initial description of CP in 1867, there have been requests in the literature for the earliest identification of CP in order to obtain early diagnostic specialised treatments. A published worldwide clinical practise guideline provides clear pathways to evidence-based tools for precise early diagnosis. With coordinated multinational initiatives targeted at lowering the age of diagnosis, this situa tion is probably going to alter now that we are in a new age. To avoid placing children at a disadvantage by depriving them of CP-specific early intervention options targeted at improving future outcomes, it will be helpful to identify obstacles that prevent doctors from being confident enough to make an early diagnosis of CP. It will be most effective to guide CP-specific early treatments and support parents by providing them with early and accurate predictive information about the future of their child if we are aware of the instruments that have the best evidence for the early classification of CP. The most frequent reason for motor impairments in newborns and toddlers is cerebral palsy (CP). Over the past few decades, there has been no change in the reported incidence of CP. Although nearly fifty percent of all children who acquire CP were born at term, weighed a normal amount at birth, and had no known risk factors. Prematurity and low birth weight is significant risk factors. Only a very small fraction of instances have a definite underlying aetiology that can be determined. The results of the history and physical examination are the key factors used to make the diagnosis of CP. Most CP patients grow up to be adults. The management of CP is best handled by a multidisciplinary team due to the numerous related conditions and complexity of the required assistance.

CONCLUSION

When it comes to description, classification, and therapy, cerebral palsy is a complex issue. Premature birth is a common risk factor for CP, so children who are at risk should receive specialised care and early developmental support. Diagnosed and monitored CP co morbidities include epilepsy and malnutrition in particular; effective management of CP co morbidities may benefit the development of CP children. Compared to children without CP, children with CP grew less. Preterm birth, low birth weight, birth asphyxia, and newborn seizures are perinatal risk factors that are significantly associated with the development of cerebral palsy in rural areas. According to the findings, improving newborn care services, educating medical and paramedical workers involved in neonatal care, and performing correct resuscitation will all help avoid the development of CP. Further evidence from our study points to the critical importance of both government and non-governmental organizations in the fight against the onset of cerebral palsy.

Suggestions

Rehabilitation clinics, as well as schools, should consider offering training to fulfill the educational needs of parents/caregivers. A close association between therapists' tactics used with children with CP and those employed at home by parents/caregivers is believed to help children grow more autonomous (Pereira et al.,). Furthermore, this training could encourage

parents/caregivers to think on their parenting techniques and SE, as well as emphasize the practicality of implementing these strategies with their toddler and stimulate their involvement.

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