The Causes And Effects Of Cerebral Palsy In Young Children

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Cerebral palsy (CP) is an umbrella term for a collection of condition resulting in lifelong motor disability. Cerebral Palsy is very, if not the most, common motor disability in childhood. It refers to a collection of neurological conditions that impact the brain as well as the coordination and movement of the muscles. Cerebral Palsy, if categorized by the area of the damage in the brain, can be divided into five types. The five types of CP are Spastic CP, Dyskinetic CP, Ataxic CP, Flaccid (hypotonic) CP, and Mixed CP. The causes of cerebral palsy in young children include perinatal stroke, thyroid disease, meconium and asphyxia, while the effects include movement, oromotor dysfunction, and comorbid conditions.

To begin with, cerebral palsy in young children is caused by many different factors such as perinatal stroke, postnatal stroke and prenatal stroke. Prenatal stroke and postnatal stroke are not formulated in birth; however, perinatal stoke forms from Placental complications which consists of abruption and choroiditis, an inflammation of the choroid of the eye. In addition, perinatal stroke occurs at the time of birth, usually around the 28th week until the 7th day of birth. All perinatal strokes are related to different injuries in the blood vessels. In addition, the main two perinatal strokes are ischemic strokes and hemorrhagic strokes, and this happens when a blocked artery cut off blood to an area of the brain. Hemorrhagic stroke occurs when a blood vessel can leak or burst so the blood spills into the brain tissue or the surroundings of the brain, and this occurs at the age of 0 to 3 years. According to Dunbar, Mary and Adam Kirton (“Perinatal Stroke”), perinatal stroke can be defined in various ways, however, it is basically a specific group to focal cerebrovascular injuries that forms early in brain development.

There are six subtitles of perinatal stoke. The first three subtitles happen mostly at the first days of life such as arterial ischemic injures, neonatal haemorrhagic stroke and cerebral sinovenous thrombosis. In addition, perinatal ischemic stroke, presumed perinatal hemorrhagic stroke, and in utero periventricular venous infraction are the three perinatal strokes that happens at the first year or later is usually with motor asymmetry. Additionally, the consequences of the injuries could include cerebral palsy, epilepsy, and cognitive and behavioral challenges. The most common cases that are common are hemiparetic cerebral palsy or congenital hemiplegia that are due to perinatal stroke. Furthermore, the connection between perinatal stroke and cerebral palsy is that it's the number one cause and the leading cause of brain damage that leads to cerebral palsy and lifelong disabilities, such as traumatic brain injury.

Secondly, thyroid disease is a butterfly-shaped gland located in the front of the neck. It produces hormones that play a key role in regulating blood pressure, body temperature, heart rate, metabolism, the reaction of the body to other hormones, and pregnancy. In addition, the three main sets of causes, firstly premature infants with transient hypothroximia increases the risks of CP, secondly, iodine deficiency that occurs when the body doesn't receive enough iodine, can lead to growth and developmental abnormalities. In addition, this conditions occurs in about 35-40% of young children worldwide. Lastly, Grave's disease is an immune system disorder that results in the overproduction of thyroid hormones and it is the most common cause of thyroid disease in young children. According to the NHS (2023), "Graves' disease is a common cause of an overactive thyroid, as it is "an autoimmune condition where the immune system produces antibodies that cause the thyroid to produce too much thyroid hormone (about 4 in every 5 people with an overactive thyroid have Grave's disease)." Finally, the two most common types of thyroid disease are hypo and hyperthyroidism. Hyperthyroidism is an overactive thyroid which means it produces too much thyroid

hormone and some of the symptoms are muscle weakness, fast heart rate at the age of toddler (1-3 years old). Additionally, Hypothyroidism is an underactive thyroid which means it does not produce enough thyroid hormone and some of the features are dry skin, cold sensitivity, and weight loss. Finally, hypothyroidism is more common than hyperthyroidism. Even though the two conditions have different signs and symptoms, and they sometimes overlap. Furthermore, goiter is an irregular growth of the thyroid disease, and this happens in both types of thyroid disease.

Finally, meconium and asphyxia in young children is one of the most common causes of cerebral palsy. Meconium is when the amniotic fluid (is a yellowish liquid that surrounds the unborn baby which is known as the fetus during pregnancy). This blocks small airways and prevents a baby from breathing properly causing respiratory distress. If this occurs, some babies may need the help of mechanical breathing machines. A baby who has inhaled meconium may also develop an infection. However, asphyxia simply means lack of oxygen and blood flow to the brain. This happens before, during and right after birth. Children and babies are the most likely to have meconium as they are the ones that are born past their due date, the mother has a health problem such as diabetes, high blood pressure, the mother used to smoke or used drug during pregnancy. In addition, the signs of asphyxia are low heart rate, problems with the umbilical cord during pregnancy and poor blood circulation. According to Pamteliadis (2018), severe meconium aspiration is defined by several factors. These include meconium-stained amniotic fluid before delivery, presence of meconium below patient's vocal cords during time of birth, signs of respiratory (breathing) difficulty, and aspiration pneumonitis shown through radiology. Children suffering from dangerous disease may show signs of pulmonary hypertension, circulatory failure, hypoxia, require immediate artificial ventilation or an extracorporeal membrane oxygenation, or ECMO, and infections and or complications in the pneumothorax. Finally, 41% of babies born with severe meconium

aspiration syndrome may acquire some small neurological irregularities, while 7% of them may have cerebral palsy. The other 14% may have severe global developmental consequences. Finally, meconium comes before asphyxia and they both technically have the symptoms as they both mainly happen at the same age.

Cerebral palsy (CP) encompasses a spectrum of neurological conditions that hinders the patient's mobility, balance, and posture due to damage to the developing brain that controls these functions, which serves as the first effect. Its effects vary in type and severity, influencing posture, mobility, balance, and movement differently among individuals. (CP) manifests through difficulties in walking, running, or climbing stairs, often necessitating mobility aids such as walkers, wheelchairs, or braces to help them get around. The type of mobility device that is needed will depend on the individual's specific needs and abilities. According to the article by Vitrikas et al. "Cerebral Palsy: An Overview", (2020), There are four categories for the movement abnormalities linked to cerebral palsy: mixed/other, dyskinesia, ataxia, and spasticity. Secondary issues such as hip pain or dislocation, balance issues, hand dysfunction, and equines deformity can arise from cerebral palsy movement abnormalities. Once cerebral palsy has been identified, its severity and response to therapy can be assessed using a tool like the Gross Motor Function Classification System. Cerebral palsy patients frequently have non-movement-related issues that require ongoing care well into adulthood. A wide spectrum of anomalies is included in the diverse clinical characteristics of cerebral palsy. Although they mostly include mobility difficulties, they can also involve a variety of anomalies such as poor balance and sensory deficiencies. Several tools can be used to assess cerebral palsy severity and treatment response once the diagnosis has been made. The Gross Motor Function Classification System is the most popular evidence-based instrument (GMFCS). The GMFCS is an age-based instrument that assesses

gross motor function in several domains, such as mobility, posture, and balance, and assigns a severity level to each of those domains. The Gross Motor Function Classification System (GMFCS) is a five-level classification system that describes the severity of CP based on a person's gross motor function. GMFCS can be used by healthcare professionals to develop treatment plans, track a person's progress over time, and communicate the level of function to others involved in the person's care. The breakdown of each level is as follows: Level I: walks independently, Level II: walks with limitations indoors, Level III: uses handheld device to walk most of the time, Level IV: uses wheelchair outdoors, may walk short distances indoors, Level V: relies on wheelchair for mobility.

The development of precise and synchronized oromotor movements provides the foundation for feeding and speech. Oro motor dysfunction (OMD) is defined as an impairment in the range, rate, strength, and fine coordination of the jaw, lips, tongue, and cheeks, which plays as the second effect. IT can disrupt the natural development of these crucial skills. OMD in children with cerebral palsy (CP) may result from weakness, rigidity, in-coordination, or involuntary movements of the oral musculature. OMD is considered a common symptom of CP. Yet its precise prevalence in this population remains relatively unclear. It is often difficult to compare findings across studies because of varying definitions of OMD. OMD often co-exists with drooling and disorders of speech and feeding, and its prevalence can vary according to the method used to identify abnormal functioning. For example, the prevalence of OMD ranges between 22% (associated with drooling), 36% (associated with motor speech impairment), and 99% (associated with dysphagia). OMD occurs in all types of CP and across the spectrum of severity. It is, however, reportedly more common in children diagnosed with dystonia or athetoid CP (also known as dyskinetic CP). Furthermore, OMD is most prevalent in children demonstrating greater limb involvement, and severe gross motor impairment. According to Handler, Henning, and Rosenberg Llc

(2020), oral motor functioning problems may arise in a child diagnosed with cerebral palsy.

We employ a complex network of muscles in our neck, face, throat, and other areas of our bodies to speak. The area of the brain that regulates speech can be impacted by cerebral palsy. A youngster suffering from cerebral palsy may experience difficulties putting words together or utilizing the right ones. A child may occasionally find it difficult to express themselves. Later in life, social issues may result from this. The association between OMD and gross motor impairment is thought to be due to the greater degree of brain damage associated with severe CP. Motor disturbances resulting from CP may extend to involve the lips, tongue, and jaw. Children having all CP types often demonstrate jaw instability resulting in reduced precision and independence of tongue and lip movements. Impaired trunk and head stabilities due to abnormal muscle tone or movements are likely to affect jaw stabilization. Additionally, abnormal tongue function is often indicated by limited range of movement and reduced strength. Abnormal tone may affect the entire tongue or, in children with unilateral CP, only one side. Excessive tone will result in the tongue resting in a retracted position. In children with severe CP, tongue movements are often not independent of those of the jaw. Finally, abnormal tone in the upper and lower lip muscles affects the range of lip movements. Restricted lip closure, rounding, and retraction often affect the production of speech sounds.

In the definition of cerebral palsy (CP), increasingly greater emphasis has been placed on the role of accompanying impairments which is the third effect that individuals face who are suffering from (CP) such as (disturbances of sensation, perception, cognition, visual impairment, Intellectual impairment) in the ability to function in daily life. According to Fluss and Lidzba (2020), “Cerebral palsy is often associated with a range of cognitive impairments that are crucial to identify during early school years” A child with CP may present several

other associated neurosensorial impairments. More than half of the patients also have additional clinical problems, affecting activity and participation. The occurrence of accompanying impairments increases with gross motor severity, while some impairments are specific for the type of lesion and clinical CP type. For example, Intellectual impairment is the most frequently associated impairment encountered among children with CP. It is prevalent in 30–40% particularly when referring to severe intellectual impairment (with an IQ level below 50) and rises to 60–70% when considering mild intellectual impairment or any specific learning disabilities. The second most frequently associated impairment is epilepsy which may appear early in life or not until school age. Many studies report that about 30% of people with CP have active epilepsy varying in type depending on the type of brain anomaly. The third most frequent associated impairment is visual impairment which can be a squint and/or a loss of visual acuity. Several studies report that about 15% of children with CP have a severe visual impairment.

The causes of cerebral palsy in young children include perinatal stroke, thyroid disease, meconium, and asphyxia, while the effects include movement, oro-motor dysfunction, and comorbid conditions. There is no cure for cerebral palsy, however the patient should be accommodated by a treatment plan which encompasses a multidisciplinary team to help maintain the patient’s condition.

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