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ABSTRACT

This paper investigated on cerebral palsy and communication disorders. Cerebral palsy (CP) is describe as one of neurological disorders that could arise from prenatal, perinatal and postnatal pathological changes or lesions of the central nervous system. Also, communication disorder is seen as a mental disorder, characterized by difficulties in speech or language severe which includes: expressive language disorder, mixed receptive-expressive language disorder and shattering. World Health Organisation in their report estimated that one million children who survive birth asphyxia live with chronic neurodevelopmental morbidities including C P, mental retardation, seizure disorders and learning disabilities. One of the most common childhood health problems associated with neurological disorders is developmental delay. Developmental delay is considered when a child fails to meet one or more developmental milestones related to motor, speech and language, social functioning, or daily living skills. Finally, the paper reviewed on the management of children with CP requires team approach. The paper concluded that sudden disability that causes activity limitation in infant brain can be attributed to non-progressive disturbances such as Cerebral palsy (CP). CP is a common cause of childhood disability as result of injury of immature brain. And thus, the paper recommends that since communication disorders are generally seen as problems that cannot be cured or solved, victimized children should never be thwarted or ostracized but should be loved and involved in everyday activity so as to eradicate the scornful thought and perception concerning the victims.

KEYWORDS: Cerebral Palsy, Communication Disorders, Child's Development and Developmental Milestone

Introduction

Cerebral palsy (CP) describes a group of permanent disorders of the development of movement and posture, causing activity limitation, which is attributed to non- progressive disturbances that occurred in the immature or developing fetal or infant brain. It is also defined as “a group of non- progressive but often changing motor impairment syndromes secondary to lesions or anomalies of brain arising in early stages of development” (Miller, 2007). Although the damage is non- progressive, the clinical picture changes as the undamaged nervous system develops and the child grows, thus the neurologic features of CP often change or progress over time (Johnson, 2004).

This definition allows for heterogeneous clinical manifestations (“a group of ... disorders”) and emphasizes that impaired movement and posture due to a disturbance in the brain is the invariant clinical manifestation (Rosenbaum et al, 2007). The International classification of functioning, Disability and Health (ICF) defines activity as the ‘execution of a task or action by an individual’ and activity limitation as difficulties an individual may experience in executing activities. For the child with CP, this can include tasks such as sitting, crawling, walking, running and climbing stairs (WHO, 2001). These early tasks engaged by infants encourage social interaction and environmental exploring which is the foundation of communication and language development. CP is a common cause of childhood disability. Other conditions are spina bifida, anterior poliomyelitis, peripheral nerve lesions and post viral polyneuropathies (Thomson et al, 1999).

The brain is one of the extremely complex organs in the human body. It receives, processes, and send out messages to other body organs and body tissues for appropriate responses. The body tissues are different muscles and other components received control from the signals from the brain. This makes it possible for us to speak, sit, stand, walk, run or carry out other body functions. The spinal cord is a connection between the brain and the other parts of the body. The two, the brain and the spinal cord make up the central nervous system. While the nerves distributed throughout the body from the central nervous system forms the peripheral nervous system. The nervous system makes it possible for communication between the brain and spinal cord to the rest of body, the processes that involve encoding, production, transmission, organize, reception and decoding of messages within and between all the body systems.

The brain is divided into different areas and parts that control the processing of information before sending out to the different parts of the body. Specifically, the left cerebral hemisphere contains the centres that have to do with processing of speech, hearing, verbal, memory and language, most especially in most right handed persons. The two areas that are mainly concern with these responsibilities are Broca’s area which located in the frontal lobe is for speech production while Wernicke’s area which located in temporal lobe is associated with speech comprehension.

Communication is the transference or transmission of information from one party to another through the use of symbols within the frame of reference of both parties. Unoh (1990) defines communication as a human phenomenon, a transactional process of exchanging and negotiating meaning to establish and maintain relationships (p.39). Both the source and receiver are constantly having impact on each other through symbolic behavior. Communication is presumed to provide satisfaction to the communicators. It is an activity that serves important function in our lives and society in general. However, it is not just enough to communicate but to communicate effectively. Effective communication occurs when what is originally intended by the sender is well understood by the receiver and vice versa because communication is a two-way process. Communication is successful when both sender and receiver have understood what was said as originally intended. Anything that distorts the effective communication flow is called communication disorders. Communication disorders are language, speech and hearing difficulties. Cerebral palsy, simply means paralysis of any part of the brain (as result of injury of immature brain), the children with this health challenge have a number of developmental disorders which range from physical, mental and communication disorders in different forms, depending on the affected areas of the brain. These disorders may be expressive, receptive or mixed (both), it may be in a certain degree or extent which means mild, moderate or severe.

Communication disorders are generally seen by the Nigerian society as problems that cannot be cured or solved and has to be lived with. This thought and perception has affected the children with cerebral palsy that have communication disorders adversely. This perceived hopeless situation affects a good number of these children whose cases and conditions deteriorate daily when no form of interventions is given. Cerebral palsy is one of the most common childhood of health problems associated with neurological disorders which causes developmental delay because of brain damage problem. Previous studies in communication science and communication disorders in different parts of developed world, most especially in the United States of America for instance reported that the American Speech Language and Hearing Association (ASHA) was formed as far back as 1926 with the ultimate objective of helping adults and children overcome communication disorders. This is achieved through screening, consultation, diagnosis, evaluation as well as multidisciplinary management approaches in line with best practices (Minifie 1994, p.15). According to Yul-Ifode (2011), “significant positive changes can be made in terms of remedy if educational and behavioural therapies are effective through early detection (p.50). Hence, the impact and effect of Speech therapists in contributing to the management of cerebral palsy children who are asymptomatic to delay in speech and with one form of communication disorders cannot be over emphasized.

Communication Disorders

Communication disorder is defined as mental disorders, characterized by difficulties in speech or language severe enough to be a problem, academically, socially or occupationally, included are expressive language disorder, mixed receptive-expressive language disorder and shattering (Dorland’s Illustrated Medical Dictionary 2004, p.28). A U.S speech language pathologist Charles Van Ripper defines Communication Disorder a “perceived deviation from normal hearing, speech or language that interferes with communication or calls adverse attention to the person possessing it, or causes him or her to be self-conscious or maladjusted” (Silverman 2003, p.5). Silverman (2003) posits that “communication disorder is an attribute of a way a person talks or listens that is considered by the person and /or others to be abnormal. This shows that communicative disorders must be noticeable abnormality in speech observed by a professional or one with judgements respected by the person in question which interferes or hinders with communication.

Silverman (2003) gave the detailed summary of definition of communication disorders in a diagrammatic way as shown below:

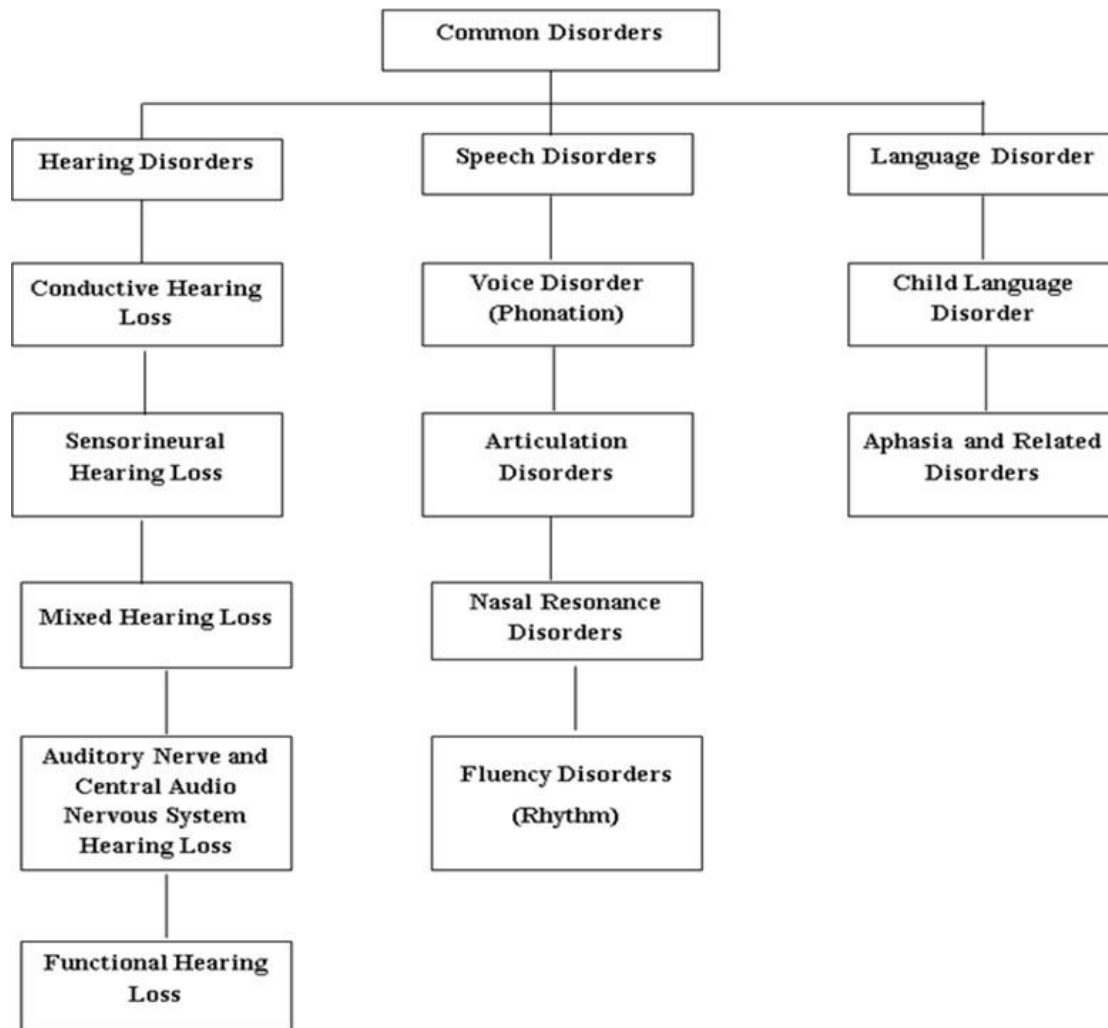


Fig. 1 Adapted from Silverman 2003, p.21

From the above, it is deduced that communication disorders are defect or abnormalities which partially or totally interrupt the process of production, reception and comprehension of human communication.

Increase in the incidence of cerebral palsy in Nigeria is perceived to be due to inadequate health facilities, illiteracy and lack of compliance with medical advices which invariably lead to assault to immature brain and its consequences, communication disorders are one of these problems.

The objectives of this study is to discuss the communication disorders as parts of the health challenge the children with cerebral palsy and should be addressed in order alleviate their sufferings.

Cerebral Palsy

C P is one of neurological disorders that could arise from prenatal, perinatal and postnatal pathological changes or lesions of the central nervous system (Edwards, 2002). In Nigeria, birth asphyxia, severe neonatal jaundice and prematurity appears to be the most important factors associated with C P (Azubuike and Nkanginieme, 2007).

According to World Health Organisation, an estimated one million children who survive birth asphyxia live with chronic neurodevelopmental morbidities including C P, mental retardation, seizure disorders and learning disabilities (WHO, 2005). CP like other neurological conditions are associated with motor impairments including muscle weakness, abnormal muscle tone, decreased joint range of motion, and decreased balance and coordination benefit from physiotherapy (Peters et al, 2008). Neurological conditions arise from pathological changes or lesions of the peripheral and central nervous system(CNS) that often lead to impaired movement and abnormal muscle tone (Edwards, 2001). Cerebral palsy, Spina bifida, Hydrocephalus, Infantile Hemiparesis, Down syndrome, Meningitis, and microcephalus is common paediatric neurological conditions in the University of Port Harcourt Teaching Hospital (UPTH) (UPTH, Physiotherapy Departmental annual report, 2016). One of the most common childhood health problems associated with neurological disorders is developmental delay which includes communication disorders.

Owoleke E. N. (2020), Shames et al (1994) describes the activity of speech as the coordination of neuromuscular movements of the organs of speech (muscles of the tongue, lips, jaw, and vocal tract). These organs are needed to produce a strings of sounds, it is stated that people use a synergy of complex activities of the nerves, brain, muscles and other body organs such as lungs, trachea, glottis, pharynx, mouth, and / or nose). In cerebral palsy, these body organs are directly or indirectly affected as a result of outcomes of injury to the immature brain compromises the control and the coordination of these organs. According to Owoleke (2020) both levels of speech, that is phonetic and phonologic are controlled and coordinated by the aforementioned body organs. In cerebral palsy, these body organs neuromuscular activities are sometime somehow impaired which may invariably result to difficulties in different communication disorders.

One of the most common childhood health problems associated with neurological disorders is developmental delay. CP is a common neurological disorder of childhood with significant neurological complications and associated comorbidities (Franks-Briggs and Alikor, 2011).

For emphasis, children with these neurological conditions benefit from Physiotherapy (Michaud, 2004). Pediatric neurological conditions still constitute health problems in developing countries (Hussain et al, 1991). The etiology of CP is very diverse and multifactorial; the causes are congenital, genetic, inflammatory, infectious, anoxic, traumatic and metabolic. Incidence reports that a developmental delay caused by neurological disorders occurs in children under age five, with the incidence increasing from 12.84% to 15.04% over the past 12 years (Boyle et al, 2011). Data collected in physiotherapy Department, UPTH from 2006- 2016 medical records shows that CP constitutes 40% of all the paediatric cases. The incidence of CP has not declined, this explained by increased survival of premature and very- low birth- weight infants and a rise in the number of multiple births.

The reported prevalence rate of CP per pregnancy for singles is 0.2%, for twins 1.5%, for triplets 8.0% and for quadruplets 43% (Yokoyama et al, 1995).

C.p is classified into two major categories, namely physiological and anatomical classifications. According to McCarthy, (1991); Styer –Acevedo, (1994) and Miller, (2007) classified C.p into five types based on areas of the brain affected by the injury. Namely, Spastic c.p (cerebral cortex – premotor area), Athetoid/ Dykinetic c.p (Basal ganglia), Dystonic C.P (globus pallidus), Crebhere atheord CP (audate nucleus), Ataxic (cerebellum – pyramidal), Hypotonic C.p (cerebral cortex – motor area) and Mixed C.p (Diffuse). While anatomical classification by Miller (2007), also grouped into six according to the limbs

affection. Namely, Hmiplegia (four limbs (one sided), Diplegia (four limbs, legs more), Quadriplegia (four limbs, the trunk, neck and face), Triplegia (two legs and one arm), Monoplegia (one limb rare) and Double hemiplegia (four limbs, arms more).

According to Pennington L.et al, (2020) stated that almost half of the children with cerebral palsy have problems in conversation of any kind. Some have dysarthria, which hinders intelligent verbal discussions, and others may not be able to communicate at all (complete dumbness). This disorder is greater among the children with dyskinetic than spastic and hypotoc c.p. This study also show that Magnetic resonance imaging studies demonstrated the lesions in cortical/subcortical regions and basal ganglia have greater risk of poor speech and communication performance in childhood are both positively associated with oromotor function, gross and fine motor function and non – verbal cognition. Therefore, there is a proof that language development appears highly correlated with non – verbal cognition. This is the reason why the children with cerebral palsy do well when they receive the combined services of the entire medical rehabilitation team, namely, Physiotherapists, occupational therapists, audiologists and speech therapists.

Child’s Development

For one to understand the challenges of the children with cerebral palsy, one must understand vividly the normal child development milestone. Development is the process whereby a young baby explores and learns and grows into adulthood. Individual skills are built up and combined to produce ever more sophisticated achievements (such as walking, talking, playing, thinking and communicating). Development is a difficult concept and many theories exist to explain how development occurs. Infancy and childhood are dynamic periods of growth and change. Neurodevelopmental and physical growth proceed in a sequential and predictable pattern that is intrinsically determined.

Skills progress from cephalic to caudal; from proximal to distal; and from generalized, stimulus-based reflexes to specific, goal-oriented reactions that become increasingly precise. Children’s development is very orderly in their ways; they actually behave and develop according to laws that can be explored, discovered, confirmed, reconfirmed, and celebrated.” By convention, these neurodevelopmental “laws” or sequences often are described in terms of the traditional developmental milestones. Developmental milestone can be defined as a set of functional skills or age-specific tasks that most children can do at a certain age range (Shepherd 1995).

Below are Normal Child Developmental Stages

Age(months)	Milestones
1	Lifts head
3	Good head control, follows, laughs, smiles
5	Reaches and grasps objects
6	Propped sitting
8	Independent sitting, equilibrium reflex
9	Gets to sitting position, present parachute reflex
10	Pulls to stand, cruises
12-14	Walks, first words

18	Removes clothes, Uses spoon
24	Uses two word phrases, throws over hand
30	Knows full name, puts on clothing
36	Jumps pedal tricycle
48	Hops, plays with others

Developmental Milestone is a Tool for Assessment of Children with Cerebral Palsy

Developmental Milestones provide a framework for observing and monitoring a child over time. According to the Bobath and Bobath (1984), the motor problems of cerebral palsy arise fundamentally from central nervous system (CNS) dysfunction which interferes with the development of normal postural control against gravity and impedes normal motor development. A thorough understanding of the normal or typical sequence of development in all domains (gross motor, fine motor, problem-solving, receptive language, expressive language, and social-emotional) allows the clinician to formulate a correct overall impression of a child's true developmental status.

Developmental Delay

Assessment of developmental milestones and the relative meaning of delays are not always clear. Some clinicians may consider a delay to simply represent a developmental lag and others may view the delay as central nervous system pathology that may resolve or subsequently manifest differently with aging of the Central Nervous System (CNS). Developmental delay is considered when a child fails to meet one or more developmental milestones related to motor, speech and language, social functioning, or daily living skills (Shevelet et. al., 2005). Developmental delay is defined as a significant developmental difficulty achieving specific milestones when compared with same age peers (Riou, 2009). Developmental delay occurs when a child exhibits a significant delay in the acquisition of milestones or skills, in one or more domains of development (i.e. gross motor, fine motor, speech/language, cognitive, personal/social, or activities of daily living).

CP Causes Developmental Delay

CP is a neurological disorder that distorts infancy and childhood dynamic periods of growth and change. Motor development is seen to depend upon various factors that may reside in the infant or in the Environment (Heriza 1991). Therefore, the goal of management of cerebral palsy is not to cure or to achieve normalcy but to increase functionality, improve capabilities, and sustain health in terms of locomotion, cognitive development, social interaction, communication development and independence as possible as the abilities of the children with cerebral palsy permit. The best clinical outcomes result from early and intensive management.

The Management of Children with CP Requires Team Approach

Optimal treatment in children requires a team approach. A modern team approach focuses on total patient development, not just on improvement of a single symptom. Effective care for children with neurological conditions is often involved in a multidisciplinary team approach with a cordial understanding between pediatricians and physiotherapists (Michaud, 2004). There are numbers of health professionals capable of given one form of assistance or the other to alleviate the problems of communication disorders in cerebral palsied children and

related medical cases. They are audiologists, speech- language pathologists, Speech – language support groups. Also, the health professionals involve in the management of each child with cerebral palsy depends on the present and anticipated needs of the particular child, therefore the team varies from one child to another.

Treatment programs encompass physical and behavioural therapy, pharmacologic and surgical treatments, mechanical aids, and management of associated medical conditions. In physical, occupational, speech, and behavioural therapies, the goals include enhancing patient and caregiver interactions while providing family support (Taylor, 2005). The Physical therapy for the children with CP begins from thorough Clinical assessment. Both subjective and objective assessment must be details and very comprehensive. The results of the overall assessment are the pointers to the goals of Physical therapy and the special needs of the children with CP. CP is easier to diagnose in more severely affected children. In these children, a diagnosis can often be made within the first months of life. About 43% of CP cases are diagnosed within this time frame; about 70% are diagnosed by the end of their first year

The Bases for Diagnosis of CP

The diagnosis of cerebral palsy is based on a clinical assessment, and not on laboratory testing or neuroimaging. In clinical practice, the diagnosis of cerebral palsy is typically based on observations or parent reports of attained motor milestones, such as sitting, pulling to stand, and walking, and evaluation of posture, reflexes, and muscle tone.

Early Signs Suggestive of CP

More mildly affected children may not have a confirmed diagnosis until as late as age 3 or 4 months. Abnormal behavior - Excessive docility or irritability, Poor eye contact, Poor sleep, Oromotor problem, Frequent vomiting, Poor sucking, Tongue retraction, Persistent bite, Grimace, Poor mobility, poor head control, Hand preference before 2 years of age, Abnormal tone.

Physical Therapy

Infancy (first stage – birth to 3years), Family education, Handling and care (Positioning, feeding and carrying techniques), Promote infant and parent interaction, Encourage development of functional skills and play, Promote sensory motor development (body image and awareness), Establish head and neck control, Attain and maintain upright position, Improve Proprioceptive and vestibular function, Visual and Language development (biofeedback), Preschool, Increase force generation (strengthening), Reduce Spasticity using positioning, stretches, ROM exercises, Rhythmic rotations, Splinting/ serial casting, botox injection, Increase mobility and flexibility, Prevent deformity using taping techniques, orthotics and night splints, positioning, Improve ambulatory capacity- weight bearing, promote dissociation, use of walkers, body weight support treadmill training, Improve play (Surbala, 2013)

Early referrals of CP cases to physical therapists will promote early intervention that eventually lead to tremendous improvements that will result into prevention of some physical and neuromuscular complications. Also, all other team member who has a vital role to play should be encourage to attend to the CP's child needs.

Early Intervention

Early Intervention is defined by Stephens and Tauber (2001) in two parts, Early refers to clinicians and other team members that manage CP cases is very important in the most critical period of a child's development between birth and three years of age. Intervention refers to programme implementation designed to maintain or enhance the child's development in natural environments and as a member of a family.

Early Interventions Physical Therapy

Numerous studies have identified the importance of early intervention and many benefits have been reported, Ayres (1979), Gulnerick (1998), Farel et al, (2003). Some are less irritable stressed behaviour (Oghi et al, 2004). Display increase in fine, gross motor, sensory, visual and self-help skills (Oghi et al, 2004). This provides foundation for skill acquisition, cognitive and social development and communication (Bottos et al, 1995), to Prevent secondary neurological, psychological and musculoskeletal complications that will lead to further developmental delay (carr& Shepperd 1998). Information provision, resources and support to parents (Palisano et al, 2004)

Areas of Early Intervention

Importance of Positioning, Training of Head control, Rolling, Trunk control, Sitting, Crawling, Walking, Upper extremity function, Respiration and Speech, Feeding, Visual perception, Social development, Cognitive development.

Pediatric Physical Therapy Activities

Play therapy; every activities should be carried out through playing with these children, You must create atmosphere of friendship and acceptability, The Physical therapy pediatric gymnasium must be attractive with different types of toys, balls, wedges and Playing gargets The play toys and gargets must be functional and target to develop specific skill.

Conclusion

The study concluded that the brain is the extremely complex organs in the human body. It receives, processes, and sends out messages to other body organs and body tissues for appropriate responses. Sudden disability that causes activity limitation in infant brain can be attributed to non-progressive disturbances such as Cerebral palsy (CP). CP is a common cause of childhood disability as result of injury of immature brain. Anything that distorts the effective communication flow is called communication disorders and Cerebral palsy is known to be a chief paralysis of any part of the brain. A child with this health challenge have a number of developmental disorders which range from physical, mental and communication disorders in different forms, depending on the affected areas of the brain.

Recommendation

Since it's certain that communication disorders are generally seen as problems that cannot be cured or solved, victimized children should never be thwarted or ostracized but should be loved and involved in everyday activity so as to eradicate the scornful thought and perception concerning the victims.

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