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Case Study

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A CASE STUDY ON CEREBRAL PALSY

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ABSTRACT
Cerebral palsy is a common cause of occurrence of disability in children. Cerebral palsy brings together a group of diseases that can cause significant changes in posture and motor skills, and can lead to loss of motor autonomy in varying proportions. Spastic cerebral palsy is the most common type of cerebral palsy. The muscles of people with spastic cerebral palsy feel stiff and their movements may look stiff and jerky. Spasticity is a form of hypertonia, or increased muscle tone. This results in stiff muscles which can make movement difficult or even impossible. Spastic cerebral palsy occurs as a result of brain damage, usually before or during birth, or sometimes within the first years of a child's life. It's a disorder that affects coordination and control of motor function. This causes the child to be delayed in reaching normal developmental milestones, and that is when it becomes more evident. Spastic cerebral palsy may be classified as quadriplegic, diplegic, or hemiplegic, according to how and where it affects the body. Oral anticonvulsants and muscle relaxants are commonly used as first-line treatments for CP such as diazepam, dantrolene, baclofen, tizanidine. Awareness of clinician regarding diagnosis and accurate treatment can reduce the disease burden.

KEYWORDS: Central Nervous System, Cerebral palsy, Spasticity, Quadriplegia.

INTRODUCTION
Cerebral palsy (CP) is a heterogenous permanent neurological disorder caused by nonprogressive damage to the developing brain. We all know that brain controls all the functions of our body like muscle movement. Cerebral palsy (CP) occurs as a result of an insult to the developing brain which may be due to birth asphyxia, trauma, infection, or prematurity in the antenatal, perinatal, or postnatal period. It is characterized by varying degrees of motor, sensory, and intellectual impairment. CP clinically manifests as spastic, dyskinetic, ataxic, and mixed type according to the involvement of brain. Additional developmental disabilities such as mental retardation, epilepsy, visual, hearing, speech, cognitive, behavioral abnormalities, and chronic systemic diseases may be present in these patients. Here, we have discussed case of spastic CP. In this disorder, injury or malformation occurs in the growing central nervous system that affects the development ofmotor function and bodyposture before, during, or shortly after birth. The term "Cerebral" refers to the brain and "Palsy" means lack of control inmuscles. The problem associated with CP in children involves muscle weakness, shakiness, balance problems, and slow response, with symptoms ranging from mild to severe. In the case of mild CP, the child may be heavy handed in one arm to some extent, and this problem may be barely noticeable, whereas in severe CP, the child may have difficulties in performing daily activities and maintaining movement, posture, and neuromuscular control, resulting in epilepsy, osteoporosis, and dysphagia. The prevalence of CP occurs in 2.5% per 1000 live births globally, and this abnormality varies with its involvement distribution like hemiplegia and diplegia, and changes with age and surgery.[1] Depending on the nature of the disorder, three dominant forms of cerebral paralysis can be distinguished: spastic, dyskinetic and ataxic. Depending on the anatomical distribution of the deficit, they are classified in monoplegia, diplegia, hemiplegia, and quadriplegia.[2]

Quadriplegic cerebral palsy: It is the most severe form and includes all four limbs; upper limbs are more severely affected than the lower limbs, related with acute hypoxic intrapartum asphyxia. Excessive cystic degeneration of the brain,which is polycystic

encephalomalacia, polyporencephalon, and developmental abnormalities (such as polymicrogyria and schizencephaly), is often revealed by neuroimaging. Very few voluntary movements are observed. Pseudobulbar signs are detected in most children with recurrent aspiration of food material and difficulty in swallowing. Optic atrophy and seizures are also observed in half of the patients. Severe intellectual abnormality is reported in most of the cases.[1]

Destructive damage to neurons in the pyramidal system determines conditioned reflex motor acts deficits. The voluntary conditional reflex movement is the most affected, especially if a high degree of complexity and finesse, such as the use of the hand, is required. The pyramidal system damage does not only permanently abolish the motor conditioned reflexes acts but also some innate reflex motor activities. Thus, cutaneous abdominal reflexes and cremasteric reflexes are affected to the abolition in the pyramidal system lesions. Spasticity is one of the dominants of the clinical picture in quadriplegia, and is due to an exaggeration of the tonic and phasic muscle stretch reflex. After a certain time, muscle stiffness may also occur amid this spasticity, seriously aggravating the pre-existing functional deficit. In turn, muscle contracture can be a preliminary stage and a cause that can lead to irreversible muscle retractions.[2]

Patient decisions to follow the recommended treatment are likely to be influenced by their beliefs about medicines as well as their beliefs about the illness that the medication is intended to treat or prevent. It has become a matter of general agreement that medical knowledge alone cannot, and indeed does not, influence people's health. An equally important partner is the state of basic education and public knowledge about the disease that influence health and therapeutic outcome and finally helps the patient to take the advice seriously rendered by a doctor. Necessary information about the treatment and other aspects can be understood only when the patients are educated well. Pharmacists can play an important role in achieving positive therapeutic outcomes by motivating patients to adhere to the treatment.[3]

CASE REPORT

We report 14 year old female patient hospitalized in the paediatrics department with a history of spastic quadriplegia with mental retardation with significant birth history of delayed crying, nasal bleeding six months back and repeated admission due to respiratory tract infection. She was being on treatment with sodium valporate 500mg since 2 years. The patient presented to the hospital with complaints of fever, cough and running nose since 1 week.

Physical examination revealed bilateral wheeze over the infraclavicular area.

During laboratory investigations, abnormal findings included anemia with **Haemoglobin** at 8.9gm/dl,(12-15gm/dl), **Ionic calcium** at 3.9mg/dl(4.4-5.4mg/dl), **CRP** at 6 (less than 2.8mg/L), **Blood urea** at 62mg/dl (13-45mg/dl).

The results of **USG Abdomen** also revealed the cystitis, Bilateral pyelonephrosis with possibility of pyelonephritis. **Abnormal EEG** suggestive of generalized seizure activity and Multiple spiral **CT scan of head** shows multiple hypo dense foci. The results of peripheral smear also revealed microcytic hypochromic anemia.

Patient started on **Inj. Sodium valporate** 100mg/ml for intravenously for seizures, **Inj.Ceftriaxone** 1g/50ml for secondary infection, **Inj. Ondansetron** 2cc intravenously for vomiting, **Duolin nebulisation** every six hours for cough and wheezing, **Syrup chlorpheniramine** 5ml for cough, **Tab. Trihexyphenidyl** 1mg for abnormal movements, Syrup **calcimax-P** 10ml to treat conditions caused by low calcium levels, **Inj. Ranitidine** 50mg for gastro intestinal disturbances. On day 3 they stopped Inj. Ceftriaxone due to leucopenia and Inj. Sodium valporate, **syp. Chlorpheniramine** and started **Inj.metronidazole** 2amp for secondary infection**., Inj. Levetriacetam** 170mg intravenously for epilepsy, **Syp. Ibuprofen** 5ml for pain and fever, On day 6 they stopped Inj. Levetriacetam and changed to tab.leveriacetam 250mg, tab. Sodium valporate 500mg for seizure episodes, **Syrup bevon** 5ml as vitamin and mineral supplements. There was clear symptomatic improvement of he symptoms observed. Patient was discharged after 10 days and advised for review after 1 week.

DISCUSSION

Although genetic abnormalities, perinatal anoxia, infection, and trauma have been proposed as etiologic factors in CP, no clear simple cause has been identified till now. However, a notable feature of CP is that infants generally have very low birth weight. Periventricular lesions can be identified on magnetic resonance imaging in upto 90% of children born prematurely who go on to develop the clinical signs of CP in the postnatal period. Other hypotheses in term infants include antenatal infection, thyroid disease, and neuronal migration disorders. Postnatal causes include meningitis, viral encephalitis, hydrocephalus, and trauma. In the present case, history suggests that the cause of CP may be genetic or perinatal hypoxia of the developing brain. Clinical manifestations usually relate to the areas of brain affected. This patient had spastic CP with clasp knife rigidity and severe mental retardation which might be because of injury to the cerebrum. Visual and hearing defects are present in 40% of CP patients. Epilepsy occurs in 47% of patients with CP and is most common in spastic quadriplegia. All medications, particularly those for convulsions and spasticity, should be continued in the perioperative period to avoid problems with acute

withdrawal and worsening of seizure control. These patients may have chronic respiratory problems because of gastroesophageal reflux, recurrent pneumonias, pulmonary aspiration, and chronic lung disease. Hence, optimization with the help of proper antibiotics, physiotherapy, and nebulization preoperatively can reduce the chances of intra‐ and post‐operative respiratory complications.

Children with CP are often underweight. Our patient weighed 15 kg which was very less for her age. Tracheal tube size selection should be based on their age not on weight as this usually provides the most appropriate fit. The endotracheal intubation was done with cricoids pressure in this patient, as these patients are prone to gastroesophageal reflux and aspiration, so we avoided the use of supraglottic airway devices (such as laryngeal mask, I‐gel) and used more safer technique.

To improves muscle strength, joint movement, and tolerance to muscular movements. Traditional physiotherapy is a routinely used interdisciplinary treatment approach for school going children as it fulfills the requirement of cooperation and active participation of these children with CP. Progressive resistance training program can help in progressively improving muscular strength. For improving joint mobility, a range of motion exercises are carried out by physical therapists. Static and gentle stretches are performed on the patient joint for preventing joint contractions. Such stretches performed within a pain-free joint range of movement. A group of healthcare providers, including physical therapist, orthopedic surgeons, and orthotist, helps in designing and implementing exercises, which improves posture, balance control, gait, and mobility. Several muscle relaxants used in the cases of CP, but their use is limited because of the side effects caused by them like lethargy, impaired cognitive skills, and others when given orally. They also have poor bioavailability because of their low lipid solubility.

The treatment given were, **Inj. Sodium valporate** 100mg/ml for intravenously for seizures, **Inj. Ceftriaxone** 1g/50ml for secondary infection, **Inj. Ondansetron** 2cc intravenously for vomiting, **Duolin nebulisation** every six hours for cough and wheezing, **Syrup chlorpheniramine** 5ml for cough, **Tab. Trihexyphenidyl** 1mg for abnormal movements, Syrup **calcimax-P** 10ml to treat conditions caused by low calcium levels, **Inj. Ranitidine** 50mg for gastro intestinal disturbances. On day 3 they stopped Inj. Ceftriaxone due to leucopenia and Inj. Sodium valporate, **syp. Chlorpheniramine** and started **Inj.metronidazole** 2amp for secondary infection**., Inj. Levetriacetam** 170mg intravenously for epilepsy, **Syp. Ibuprofen** 5ml for pain and fever, On day 6 they stopped Inj. Levetriacetam and changed to tab.leveriacetam 250mg, tab. Sodium valporate 500mg for seizure. Counseling has provided to bystander regarding disease, cause of disease, further life style modifications and how to maintain good mental health to avoid same kind episodes in future.

CONCLUSION

CP is a group of non progressive disorders affecting body movement and posture. This condition is permanent and occurs during fetal development or infancy. Different treatment options are available for patients with CP. In this review paper, we summarize the case of spastic cerebral palsy reported in our hospital. The individualization of the rehabilitation program and the family involvement are essential in the functionality of the favorable development of the gross motor and the manual ability in children with spastic quadriplegia. Then patient started to responds with medication and progressively reduced symptoms. Patient and more over her family should aware about her condition for avoiding same kind episodes in future.

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