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Research Article

New Therapies for the Treatment of Ataxic Cerebral Palsy Caused by Kernicterus

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Abstract

Background: Early during life, excessive hyperbilirubinemia results in accumulation of bilirubin in the grey matter of the brain causing neurotoxicity with damage of neurons by apoptosis and necrosis leading to irreversible brain damage called kernicterus and bilirubin encephalopathy. Clinical manifestations of kernicterus include ataxic form of cerebral palsy. We have previously reported the novel use of cerebrolysin and citicoline in the treatment of a girl with kernicterus who experience improvement without the occurrence of side effects. The aim of this paper is to describe the beneficial use of cerebrolysin and citicoline a boy with ataxic form of cerebral palsy caused by kernicterus.

Patients and Methods: The treatment of a two-year old boy with ataxic cerebral palsy caused by kernicterus associated with delayed speech is described. Before treatment, the boy had difficulty in sitting without support for more than few seconds and was holding the chair to keep his position. He could stand holding furniture and could stand alone for seconds but was unable to take any further step without support. The boy was treated with intramuscular cerebrolysin 3 ml every other day (15 doses), and intramuscular citicoline 3 ml (375 mg) every other day.

Results: After treatment, the boy was able to sit without support for long time and could stand without holding anything for long time.

Conclusion: The use of intramuscular cerebrolysin and citicoline was associated with some improvement and was found to be beneficial without the occurrence of any side effects.

Keywords: *Ataxic Cerebral Palsy; Kernicterus; Treatment; Cerebrolysin; Citicoline*

Introduction

Kernicterus is a neurological disorder resulting from neonatal and early infancy bilirubin neurotoxicity. Early during life, excessive hyperbilirubinemia results in accumulation of bilirubin in the grey matter of the brain causing neurotoxicity with damage of neurons by apoptosis and necrosis leading to irreversible brain damage, and a variety of chronic neurological abnormalities and dysfunctions. Clinical manifestations of kernicterus may include severe motor disability with inability to walk. We have previously reported the novel use of cerebrolysin and citicoline in the treatment of a girl with kernicterus who experience improvement without the occurrence of side effects

[1,2]. The aim of this paper is to describe the beneficial use of cerebrolysin and citicoline in a boy with ataxic cerebral palsy caused by kernicterus.

Patients and Methods

A.M was first seen at about the age of two years because of ataxic gait and delayed speech. The mother thought that he had started sitting at the age of 14 months and had started trying to stand and walk holding furniture after the age of 20 months. He was not controlling bowel yet and was unable use spoon. The mother thought that he can understand what is being said and trying to express his needs. He developed neonatal hyperbilirubinemia because of Rh incompatibility and was treated with two exchange transfusions and phototherapy. At the clinic, he had difficulty in sitting without support for more than few seconds and was holding the chair to keep his position (Figure 1A). He could stand holding furniture and could stand alone for seconds but was unable to take any further step without support (Figure 1B). He accepted to take a pen to copy a straight line, but he could draw only short curved lines (Figure 1C). The boy was treated with intramuscular cerebrolysin 3ml every other day (15 doses) and intramuscular citicoline 3 ml (375 mg) every other day.

Figure 1A: *At the clinic, the patient had difficulty in sitting without support for more than few seconds and was holding the chair to keep his position.*

Figure 1B: *The boy could stand holding furniture and could alone for seconds, but was unable to take any further step without support.*

Figure 1C: *The boy accepted to take a pen to copy a straight line, but he could draw only short curved lines.*

The protocol for this research was approved by the scientific committee of Iraq headquarter of Copernicus Scientists International Panel and conforms to the provisions laid out in the Declaration of Helsinki (as revised in Edinburgh 2000).

Results

After treatment, the boy was able to sit without support for long time (Figure 2A). He could stand without holding anything for long time (Figure 2B).

Figure 2A: *After treatment, the boy was able to sit without support for long time.*

Figure 2B: *After treatment, the boy could stand without holding for long time.*

Discussion

Cerebrolysin is a safe mixture of active brain neuro-peptides having well-known neuroreparative properties that can contribute in improving brain functions in a variety of neurologic conditions. Cerebrolysin contains free amino acids (85%) and 15% biologically active low molecular weight amino acid sequences which include low molecular weight neuro-peptides [1-15]: 1-Brain-derived neurotrophic factor. 2-Glial cell line-derived neurotrophic factor. 3-Nerve growth factor. 4-Ciliary neurotrophic factor.

Cerebrolysin has been increasingly used in the treatment of a variety of childhood neurological and psychiatric disorders including brain atrophy, cerebral palsy, kernicterus, and agenesis of the corpus callosum, idiopathic mental retardation, pediatric juvenile spinal muscular atrophy, Charcot Marie Tooth disease, myelomeningocele autism, and Rett syndrome [1-15].

Citicoline is the generic name of cytidine 5-diphosphocholine (CDP-choline, cytidine diphosphate choline) when used as an exogenous sodium salt. Cytidine diphosphate choline is a mononucleotide made of ribose, pyrophosphate, cytosine and choline. It is a water-soluble naturally occurring substance that is generally grouped with the B vitamins. It is also considered a form of the essential nutrient choline. Citicoline is a safe substance with generally minor side effects which may include digestive intolerance after oral administration.Citicoline has become available throughout the world and recently it has become available in the United States as a dietary supplement [10].

Like cerebrolysin, citicoline been increasingly used with benefit in treatment of childhood neuro-psychiatric disorders including mental retardation [4,16], pervasive developmental disorders including Rett syndrome [11,13], brain atrophy [3], and spastic cerebral palsy [5,6].

Conclusion

The use of intramuscular cerebrolysin and citicoline was associated with some improvement and was found to be beneficial without the occurrence of any side effects.

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