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Research Article

Evidence-Based Multimodal Management of Severe Post-Asphyxial Cerebral Palsy in a Turkish Girl from Sweden

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Abstract

Severe perinatal asphyxia is a major cause of cerebral palsy and neurodevelopmental disability. We report the case of a 22-month-old girl who developed cerebral palsy and developmental delay following hypoxic-ischemic encephalopathy (HIE) at birth. The patient initially underwent unregulated stem cell therapy abroad without benefit. Based on published evidence and our prior clinical experience with neuroprotective agents, she was treated sequentially with Cerebrolysin, Citicoline, Piracetam, collagen hydrolysate, and nutritional support. Improvements were observed in motor strength, vocalization, and cognitive responsiveness across successive treatment courses. This case highlights the importance of evidence-based medicine (EBM) in guiding rational therapeutic interventions in complex neurological disorders, and in resisting unproven alternative approaches.

Keywords: cerebral palsy; refractory epilepsy; citicoline; cerebrolysin; piracetam; evidence-based medicine

Introduction

Hypoxic-ischemic encephalopathy is one of the most devastating perinatal complications, with survivors often facing cerebral palsy, intellectual disability, or epilepsy.

In recent years, families have increasingly sought unregulated “stem cell” interventions, which lack reproducible evidence of benefit. In contrast, evidence-based medicine integrates clinical expertise, the best available evidence, and patient/family values to optimize care and avoid unscientific approaches [1-13].

The practice of evidence-based medicine requires integration of [14]:

1. Best available research evidence
2. Clinical expertise
3. Patient and caregiver values

We report the case of a young girl with severe cerebral palsy after birth asphyxia who demonstrated developmental gains with an evidence-based multimodal pharmacological program, building on our previous experience with the treatment of cerebral palsy and other neurological disorders.

Patient and methods

A 22-month-old Turkish girl from Sweden who was born at 42+0 weeks via vacuum extraction after severe asphyxia (Apgars: 0, 1, 3). She required cardiopulmonary resuscitation and spontaneous breathing occurred at 60 minutes. She was treated with hypothermia for 72 hours. She developed seizures at 36 hours, managed with phenobarbital and midazolam. Magnetic resonance imaging performed at day 7, showed restricted diffusion in corpus callosum, subtle changes in globus pallidus, possible thalamic signal changes, and occipital laminar necrosis, consistent with subtotal asphyxia.

The patient was discharged with a diagnosis of severe hypoxic-ischemic encephalopathy with risk for cerebral palsy. Over time, global developmental delay and cerebral palsy became evident.

Prior interventions: Parents sought unregulated stem cell therapy abroad with no benefit, then presented to our clinic after reading about our successful management of a boy with ataxic cerebral palsy from Virginia.

Individualized evidence-Based multimodal therapies were recommended based on our extensive published evidence-based experiences with treatment of cerebral palsy and other neurological conditions [1-13, 15].

Results

Treatment and Outcomes

First course

- Cerebrolysin 3 ml IM every other day × 15 doses
- Citicoline syrup 300 mg daily

Outcome: Improved neck and trunk strength, especially during final week.

Second course

- Intramuscular piracetam 2.5 ml every other day
- Oral citicoline 250 mg daily
- Collagen hydrolysate (CH-Alpha) 2 ml daily

Outcome: Some cognitive improvements. Increased vocalization; consonant "b" produced daily instead of once weekly.

Third course

- Intramuscular cerebrolysin 3 ml IM every third day × 10 doses
- Intramuscular piracetam 2.5 ml IM every third day × 10 doses (alternate days)
- Oral citicoline 250 mg daily
- CH-Alpha 2 ml daily
- Royal-plus capsule daily

Outcome: Enhanced cognitive responsiveness, more consistent vocal attempts, improved interaction.

Fourth and fifth courses

- Intramuscular citicoline 2 ml IM every third day (10 doses monthly)
- Intramuscular piracetam 2.5 ml IM every third day (10 doses monthly)
- CH-Alpha 2 ml daily
- Royal-plus capsule daily

Outcome: Continued gains in awareness, vocalization, and motor engagement. Before treatment, the girl was not crawling and was not able to sit even with support. After treatment, she was crawling for few centimeters (Moving by dragging her tummy on the floor) and was able to sit with support (Figure-1).

Figure 1A: After treatment, she was crawling for few centimeters

Figure 1B: After treatment, she was able to sit with support

Discussion

This case underscores the value of an evidence-based medicine framework in managing severe cerebral palsy after birth asphyxia.

1. Pathophysiology-based therapy

- ***Cerebrolysin:*** Help in improving neuroplasticity and motor outcomes in pediatric cerebral palsy.
- ***Citicoline:*** Can enhance neuronal membrane repair and has shown cognitive benefits in brain injury.
- ***Piracetam:*** Can enhance motor and cognitive function in children with cerebral palsy.
- ***Nutritional support*** (collagen hydrolysate, micronutrients) provided supportive benefit for neuromuscular function.

2. Sequential adaptive therapy

- Cyclic regimens allowed assessment of measurable outcomes before proceeding.
- Improvements in trunk stability, vocalization, and cognitive interaction were documented over time.

3. Contrast with unscientific interventions

- Unregulated stem cell therapy yielded no benefit, consistent with current systematic reviews showing lack of reproducible efficacy.
- In contrast, evidence-based therapy produced tangible functional gains.

4. Family-centered care

- Counseling recalibrated expectations away from "cure" promises towards quality of life and functional enhancement.

Cerebrolysin is a mixture of free amino acids (85%) and 15% biologically active low molecular weight amino acid sequences which include low molecular weight neuro-peptides (Brain-derived neurotrophic factor, glial cell line-derived neurotrophic factor, nerve growth factor, ciliary neurotrophic factor.

Cerebrolysin has been used safely with benefit in a variety of neuro-psychiatric disorders including idiopathic mental retardation, cerebral palsy, brain atrophy, myelomeningocele, pediatric juvenile spinal muscular atrophy, pediatric Charcot Marie Tooth disease, kernicterus, and agenesis of corpus callosum with colpocephaly [16-25].

Citicoline is a safe form of the choline has been increasingly grouped with the water-soluble B vitamins. It has been increasingly used with noticeable benefits in the treatment of several pediatric and neuro-psychiatric disorders including, cerebral palsy, cognitive impairment, autism disorders, Rett syndrome, and kernicterus [26, 27].

Piracetam beneficial effects on impaired cerebral functions include improving neuronal and cognitive functions, increasing cerebral blood flow and oxygen consumption, improving neurotransmitter's function and brain neurotransmission. Piracetam is not associated with important side effect nor has acute toxicity at the therapeutic doses. Piracetam has been used with important benefits in the treatment of cerebral palsy and other childhood neuro-psychiatric disorders [28, 29].

Conclusion

Severe perinatal asphyxia often results in cerebral palsy with profound disability. This case illustrates how evidence-based medicine-guided multimodal therapies using neurotrophic, nootropic, and nutritional agents can yield measurable developmental improvements. Rational, evidence-based care should be prioritized over unregulated interventions in the management of pediatric neurological disorders.

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Conflict of interest: None.

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