



THE ROLE OF PHARMACOPUNCTURE IN THE CORRECTION OF NEUROLOGICAL DISORDERS IN CHILDREN WITH CEREBRAL PALSY USING LIPOSOM FORTE.

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Abstract: Cerebral palsy (CP) is accompanied by persistent motor and cognitive impairments, requiring a comprehensive approach to rehabilitation. Pharmacopuncture is considered a promising method combining the benefits of acupuncture and local administration of biologically active substances. Its effectiveness in reducing spasticity, improving motor function, and normalizing neuromuscular responses in children with neuromotor disorders has been described in the literature. Liposom Forte, with its neurometabolic and neuroprotective effects, could theoretically enhance the effects of pharmacopuncture by improving the nutrition and function of the central nervous system. However, current data indicate a lack of clinical studies confirming the safety and efficacy of the combined use of Liposom Forte and pharma puncture in children with cerebral palsy. This emphasizes the need for further randomized trials to support the use of this combined technique in pediatric practice.

Keywords: pharma puncture, reflexology, Liposom Forte, cerebral palsy.

Introduction

Cerebral palsy (CP) is a group of chronic movement disorders caused by perinatal or prenatal damage to the central nervous system. These disorders are often accompanied by spasticity, contractures, and cognitive and perceptual impairments, requiring comprehensive rehabilitation. Traditional methods include physiotherapy, exercise therapy, medication, and botulinum toxin [2,4].

Pharmacopuncture is a method of administering medicinal substances to acupuncture points, combining the stimulation of traditional medicine points with pharmacotherapeutic effects. In the context of CP, pharmacopuncture may represent a promising adjunctive treatment for neurological disorders through its gentle, localized effects on the nervous system [4,5]. Liposom Forte is a liposomal nootropic drug often considered in neurology as an adjunctive treatment for cerebral metabolic disorders, particularly neuroendocrine disorders. However, its use in children, particularly in combination with pharmacopuncture, is poorly described in the literature, making this review particularly relevant [15].

Review Methodology

The review analyzed key publications and studies in the following areas:

*General effectiveness of pharmacopuncture for neurological disorders, particularly in children and in rehabilitation settings.

*Specific use of pharmacopuncture in patients with cerebral palsy.



*Clinical and preclinical data on Liposom Forte, its pharmacological properties, safety, and potential mechanisms of action.

*Compatibility of pharmacopuncture and Liposom Forte: existing data, gaps, and prospects [19,20].

Key findings of the literature review

1. Effectiveness of pharmacopuncture for neurological disorders.

There is clinical data on the use of pharmacopuncture in the rehabilitation of neuromotor disorders in children. In a study in Uzbekistan, patients (5–15 years) with neuromotor system disorders received complex rehabilitation + pharmacopuncture, and after the course of treatment, improvement in contractures, spasticity, muscle wasting and other parameters was noted [22,25].

General guidelines for pharmacopuncture emphasize that the method is based on the administration of medications directly into biologically active points, which ensures a targeted effect with minimal systemic effects.

In clinical practice, pharmacopuncture is also used for muscular and skeletal disorders, such as dorsopathies, demonstrating its therapeutic reliability and tolerability [3,5].

2. The use of pharmacopuncture directly in children with cerebral palsy.

Rostacheva et al. describe original reflexology techniques (including pharmacopuncture) for cerebral palsy. In their review, the technique of injections into active points showed the best results when combined with traditional acupuncture therapy [7,8]. At the Institute (according to MosmedClinic), stimulating pharmacopuncture with the administration of "organ preparations" was used to improve motor, perceptual, and speech functions in children with various forms of cerebral palsy, including spastic diplegia [15,17].

Rostacheva's review noted that a combined approach (pharmacopuncture + acupuncture) allows for reduced drug dosages, which is especially important in the pediatric population [2,3].

3. Properties and clinical use of Liposom Forte.

According to the instructions, Liposom Forte is an adjuvant treatment for metabolic cerebral disorders associated with neuroendocrine disorders. Pharmacokinetic data show that after parenteral administration, the drug molecules are stable in the blood and are able to reach brain cells.

However, the instructions state that the use of Liposom Forte is not recommended for children due to a lack of data on safety and efficacy in pediatrics. There are reports of Liposom Forte's use in neurology. For example, in Kazakhstan, the Department of Nervous Diseases studied its effectiveness in neurological disorders. A study in patients with closed traumatic brain injury (Zhabyk bas-mi zharakty) demonstrated that the use of Liposom Forte promotes a rapid reduction in mnestic (memory) impairment [21, 23].



An Uzbek neurological article discusses the importance of "neurobiomarkers" (GFAP, S100 proteins, serotonin and dopamine receptors) in children with CNS lesions and mentions Liposom Forte in the context of outpatient or combination therapy [39, 40].

Discussion

This review demonstrates that pharmacopuncture is a promising adjunctive method for the rehabilitation of children with cerebral palsy. The combined use of pharmacopuncture and traditional methods (acupuncture, physiotherapy) has been shown to improve motor function, reduce spasticity and contractures, and potentially improve cognitive parameters.

However, integrating Liposom Forte into pharmacopuncture raises significant scientific and clinical challenges:

Lack of pediatric safety and efficacy data. According to the manufacturer's instructions and pharmacy sources, the drug is not recommended for use in children due to a lack of sufficient clinical trials.

Limited number of studies, especially randomized controlled trials. There are virtually no published studies in the literature specifically using pharmacopuncture with Liposom Forte in children with cerebral palsy (based on public databases).

Unclear mechanisms of action for this combined approach. Although there are preclinical data and pharmacokinetics, the exact pathways by which the liposomal drug interacts with neuronal and met Ethical and regulatory issues. The implementation of experimental treatment regimens in children requires strict monitoring, adherence to clinical protocols, and parental/guardian consent. However, there are several scientific prerequisites for further research:

Potential of liposomal delivery systems: Liposomes can improve drug penetration across the blood-brain barrier, specifically delivering active substances to nerve tissue.

The role of biomarkers (e.g., GFAP, S100) in monitoring therapy effectiveness: As demonstrated by neurobiomarker analysis, the impact of therapy on CNS damage and recovery can be objectively assessed.

The integration of Oriental medicine and pharmacology through pharmacopuncture offers the opportunity to reduce drug dosages, minimize side effects, and improve localized action, which is particularly important in the treatment of chronic neurological conditions [39,40].abolic mechanisms remain poorly understood.

The Role of Pharmacopuncture in the Rehabilitation of Cerebral Palsy

Cerebral palsy is incurable, so it requires restorative treatment and rehabilitation. However, timely and appropriate rehabilitation can lead to significant improvements in lost functions. The rehabilitation program depends on the severity, nature, and primary location of the symptoms, as well as the presence of associated symptoms: hearing, speech, vision, behavioral, and intellectual impairments [46,47]. Pharmacopuncture can be a component of the rehabilitation complex. Its effect is mediated by the summation and potentiation of puncture and the drug, whose deposition



at biologically active points (BAPs) causes prolonged stimulation with long-term maintenance of neuroreflexive and humoral responses [6,7].

Pharmacopuncture is a method of injecting various medications into reflexology points to achieve a therapeutic effect in various medical conditions. Technically, the procedure involves subcutaneous or intradermal administration of the medication into acupuncture points at a dose of 0.2-0.3 ml per locus. The therapeutic course is 7-10 days [8,9].

Due to the presence of side effects and contraindications in the treatment of children with cerebral palsy, the use of "Liposome Forte" has become relevant.

Clinically proven effects of this medication:

*nootropic effect

*mnemotropic effect

*adaptogenic effect

*anti-asthenic effect

*psychostimulant effect

*antidepressant effect. Furthermore, Liposome Forte contains 5 phospholipid fractions, which stimulate regeneration and proliferation processes in neurons, improve brain metabolism, participate in the synthesis of neurotransmitters, activate bioreceptors, and enhance cognitive function. Based on these data, the use of Liposome Forte as a pharmacopuncture may be justified in the comprehensive rehabilitation of patients undergoing restorative treatment for cerebral palsy.

Medicinal reflexology (pharmacopuncture) is performed strictly according to the following rules:

- the treatment is carried out according to a standard protocol, by stimulating a combination of local, segmental points with the administered medication;
- the medication can be administered as one or two drugs in a "cocktail" format, sequentially, with an interval of 1-2 hours;
- if multiple injections are ineffective, it is worth replacing them with another medication;

Absolute contraindications to pharma puncture include acute illnesses, especially those of infectious origin, fever, worsening epilepsy, allergic reactions to administered medications, and neoplasms.

The method of local reflex administration of medications exists in several modifications, distinguished by differences in definition:

mesopuncture - multiple injections of medications into the area of the corresponding metamere. Neural therapy - includes the injection of anesthetics into the locus dolendi, pathological foci, ganglia, and periosteum;



Homeosiniatry - encompasses the concept of "homeopathy" and the administration of homeopathic remedies;

Biopuncture - the administration of homeopathic and herbal medicines [27, 28, 29].

The 60 children with cerebral palsy (32 girls and 26 boys) under observation at the Republican Children's Psychoneurological Hospital named after U.K. Kurbanov, aged 3 to 18 years (average age 5-12 years), were divided into two groups. In the 1st, along with standard measures, the drug liposome forte was administered intramuscularly, in the 2nd - at reflexology points, i.e. by pharmacopuncture for a 10-day course. Spastic form of cerebral palsy was detected in 55% of patients, hemiplegic form - 28.5%, hyperkinetic form - 16.6%. Of those examined, 82% complained of limited and stiff movements in the limbs, mental retardation, limited fine motor skills; 12% - speech impairment such as spastic dysarthria; 6% - forced movements of the head, neck, and torso. Liposome Forte, a drug with a potent nootropic effect, was administered subcutaneously into the biologically active point using an insulin syringe at a dose of 0.2 ml per session, without dilution with saline or anesthetics. Therapy was administered three times per week for a total of 10 days.

Treatment monitoring was performed through neurological assessment, including independent motor skills using the GMFCS (Level 5, 2007), cognitive function using the MMSE (1975), fine motor assessment using the Dyspraxia-Dysgnosia Test, hip X-rays, and electroencephalography (EEG) to detect changes in brain function. Post-treatment analysis confirmed the significant benefit of pharmacopuncture, particularly in terms of changes in several parameters. For example, based on the time to achieve a stable effect, this method was 1.5 times more effective than the comparison method. This difference was reflected in improved overall motor activity, decreased spasticity and muscle tone, reduced stiffness and forced movement, increased range of active and passive limb movements, and normalized speech.

Conclusions and Recommendations

The role of pharmacopuncture in the rehabilitation of cerebral palsy is confirmed as an effective adjunctive method, especially when combined with other therapeutic approaches. Randomized clinical trials are needed, including control groups, long-term follow-up, objective biomarkers (neurobiomarkers), motor function, and cognitive parameters. Ethical protocols for such studies should be developed to ensure the safety of children, compliance with regulatory requirements, and informed parental consent. An interdisciplinary approach—bringing together specialists in reflexology, pediatrics, neurology, and pharmacology—is recommended to optimize the treatment regimen.

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