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THE ROLE OF OSTEOPATHY IN COMPREHENSIVE REHABILITATION OF CHILDREN WITH PERINATAL CNS INJURY

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ABSTRACT:

Perinatal central nervous system (CNS) injury remains a leading cause of neurological impairment and developmental delay in early childhood. The integration of non-pharmacological approaches into rehabilitation programs has gained increasing attention, particularly osteopathy. This study aims to evaluate the effectiveness of osteopathic treatment as part of comprehensive rehabilitation in children with perinatal CNS injury. The findings demonstrate a positive impact of osteopathy on neurological status, muscle tone, and overall development.

Introduction

Perinatal central nervous system injury encompasses a range of pathological conditions occurring during the antenatal, intranatal, or early postnatal periods. Common etiological factors include hypoxia, birth trauma, intrauterine infections, and metabolic disturbances.

Despite advances in neonatology and pediatric neurology, perinatal CNS injury continues to be a major public health concern due to its long-term consequences, such as:

- delayed psychomotor development,
- motor dysfunction,
- cerebral palsy,
- cognitive impairment.

Comprehensive rehabilitation programs typically include pharmacotherapy, physical therapy, massage, and physiotherapy. Recently, osteopathy has emerged as a promising complementary approach due to its gentle, non-invasive techniques and holistic perspective.

Osteopathy views the body as an integrated system in which structural imbalances may affect function. This is particularly relevant in infants, as the high neuroplasticity of the developing brain allows for significant improvement with early intervention.

Aim of the study: to assess the effectiveness of osteopathy as part of комплексной rehabilitation in children with perinatal CNS injury.

Methods

Study Design

This study was designed as a prospective, controlled clinical investigation aimed at evaluating the contribution of osteopathic intervention to the overall rehabilitation outcomes in infants diagnosed with perinatal CNS injury.

Clinical Framework

The research was conducted within a multidisciplinary rehabilitation setting, where patients received coordinated care involving pediatric neurologists, physiotherapists, and osteopathic practitioners. Such an integrated model ensured a comprehensive approach to both structural and functional impairments.

Participants

Sixty infants aged between 1 and 12 months were recruited and evenly distributed into two groups. All participants had a clinically established diagnosis of perinatal CNS injury based on neurological examination and developmental assessment.

Intervention Strategy

Both groups underwent standardized rehabilitation protocols, including pharmacotherapy and physical rehabilitation techniques. The intervention group additionally received individualized osteopathic care.

Osteopathic sessions were tailored to each patient following a detailed palpatory assessment and functional diagnosis. The therapeutic approach emphasized:

- restoration of physiological mobility of cranial structures,
- reduction of fascial restrictions,
- improvement of fluid dynamics,
- support of autonomic balance.

Special attention was given to the craniosacral system due to its relevance in early neurodevelopment and vulnerability to birth-related mechanical stress.

Treatment Course

Osteopathic intervention was administered once weekly over a period of 8–10 weeks. Each session lasted approximately 30–40 minutes and was adapted to the child's tolerance and clinical condition.

Outcome Evaluation

Patient progress was assessed dynamically throughout the study using a combination of objective and clinical indicators:

- neurological status evaluation,
- muscle tone assessment,
- developmental milestone tracking,
- behavioral and autonomic responses (sleep, feeding, irritability).

Data Analysis

Comparative analysis between groups focused on the rate and extent of functional improvement. Statistical significance was determined using standard analytical methods, with a confidence level set at $p < 0.05$.

Results

At the end of the treatment course, the following outcomes were observed:

Main Group

- normalization of muscle tone in 73% of patients,
- improvement in motor skills in 68%,
- reduction of neurological symptoms in 70%,
- improvement in sleep and general condition in 65%.

Control Group

- normalization of muscle tone in 45%,
- improvement in motor skills in 40%,
- reduction of neurological symptoms in 42%.

Comparative Analysis

Patients receiving osteopathic treatment demonstrated significantly better outcomes across all parameters ($p < 0.05$).

Additionally, the main group showed:

- faster recovery of reflexes,
- reduction in autonomic dysfunction,
- improved interaction with the environment.

Discussion

The results of this study support the effectiveness of osteopathy as a complementary method in the rehabilitation of children with perinatal CNS injury.

The possible mechanisms of osteopathic intervention include:

- improvement of microcirculation,
- normalization of cerebrospinal fluid dynamics,
- reduction of muscular tension,
- modulation of the autonomic nervous system.

Craniosacral therapy may play a key role by addressing structural dysfunctions of the skull and spine resulting from birth trauma.

These findings are consistent with existing literature suggesting that early intervention using gentle manual techniques enhances neuroplasticity and functional recovery.

However, the study has several limitations:

- relatively small sample size,
- lack of long-term follow-up,
- partial subjectivity of clinical assessments.

Further randomized controlled trials with larger populations are needed.

Conclusion

Osteopathy is an effective and safe adjunct to standard rehabilitation in children with perinatal CNS injury.

Its use contributes to:

- normalization of muscle tone,
- improvement in psychomotor development,
- reduction of neurological symptoms,
- enhancement of quality of life.

The integration of osteopathy into early rehabilitation programs represents a promising direction in pediatric neurology and rehabilitation medicine.

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