



THE ROLE OF BIOACOUSTIC CORRECTION IN AFFECTIVE RESPIRATORY PAROXYSMS IN CHILDREN

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ABSTRACT

Affective respiratory paroxysms (ARPs) are sudden, involuntary breath-holding spells typically triggered by emotional stimuli in young children, often causing distress for both families and clinicians. Though generally benign, frequent episodes can lead to hypoxia, syncope, and behavioral disturbances. In recent years, non-pharmacological therapies, particularly bioacoustic correction (BAC), have emerged as promising interventions. This article explores the pathophysiology of ARPs, traditional treatment approaches, and the therapeutic potential of bioacoustic correction as a neuromodulatory method to restore autonomic balance and reduce episode frequency. Evidence from clinical studies and neurological theories supporting BAC use is discussed, with a focus on pediatric care.

РОЛЬ БИОАКУСТИЧЕСКОЙ КОРРЕКЦИИ В АФФЕКТИВНЫХ РЕСПИРАТОРНЫХ ПАРОКСИЗМАХ У ДЕТЕЙ

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Аффективные респираторные пароксизмы, биоакустическая коррекция, приступы задержки дыхания, детская неврология, вегетативная регуляция, немедикаментозная терапия.

ABSTRACT

Аффективные респираторные пароксизмы (АРП) — это внезапные произвольные приступы задержки дыхания, обычно вызываемые эмоциональными стимулами у маленьких детей, часто вызывающие стресс как у семей, так и у врачей. Хотя в целом они доброкачественные, частые эпизоды могут приводить к гипоксии, обморокам и поведенческим нарушениям. В последние годы нефармакологические методы лечения, в частности биоакустическая коррекция (БАК), стали многообещающими вмешательствами. В этой статье рассматривается патофизиология АРП, традиционные подходы к лечению и терапевтический потенциал биоакустической коррекции как нейромодуляторного метода для восстановления автономного баланса и снижения частоты эпизодов. Обсуждаются данные клинических исследований и неврологических теорий,



подтверждающие использование БАК, с акцентом на педиатрическую помощь. Ключевые слова: Аффективные респираторные пароксизмы, биоакустическая коррекция, приступы задержки дыхания, детская неврология, вегетативная регуляция, немедикаментозная терапия.

BOLALARDA AFFEKTIV RESPIRATOR PAROKSIZMLARDA BIOAKUSTIK KORREKTSIYASINING O'RNI

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ABSTRACT

Affektiv respirator paroksizmlar (ARP) nafasni ushlab turishning to'satdan beixtiyor xurujlari bo'lib, odatda yosh bolalarda hissiy stimullar bilan qo'zg'atiladi va ko'pincha oilalar va klinisyenlar uchun stressni keltirib chiqaradi. Odatda yaxshi bo'lsa-da, tez-tez epizodlar gipoksiya, hushidan ketish va xatti-harakatlarning buzilishiga olib kelishi mumkin. So'nggi yillarda farmakologik bo'lmagan davolash usullari, xususan, bioakustik tuzatish (BAC) istiqbolli choralar sifatida paydo bo'ldi. Ushbu maqolada vegetativ muvozanatni tiklash va epizodlar chastotasini kamaytirish uchun ARP patofiziologiyasi, an'anaviy davolash yondashuvlari va bioakustik tuzatishning terapevtik salohiyati neyromodulyator usuli sifatida ko'rib chiqiladi. Klinik tadqiqot ma'lumotlari va BACdan foydalanishni qo'llab-quvvatlovchi neurologik nazariyalar muhokama qilinadi, bunda pediatrik yordamga alohida e'tibor beriladi.

Introduction. Affective respiratory paroxysms (ARPs), also known as breath-holding spells (BHS), are characterized by episodic apnea in response to emotional stressors such as anger, frustration, or fear. ARPs typically occur in children between the ages of 6 months and 6 years, with an incidence rate of about 5% among healthy children (Di Mario, 2001). These episodes can manifest as cyanotic, pallid, or mixed types, often causing anxiety among caregivers due to the dramatic presentation of symptoms like loss of consciousness, convulsions, or muscle rigidity.

Despite their benign nature, ARPs can disrupt a child's emotional and neurological development if recurrent and severe. Traditional treatment approaches include reassurance, behavioral modification, and in rare cases, iron supplementation or anticonvulsants. However, recent advances in neurotherapy have led to the application of bioacoustic correction (BAC) — a method that utilizes the body's response to modulated sounds to regulate central nervous system (CNS) activity and autonomic balance. This article investigates the physiological mechanism of ARPs and the emerging role of BAC in mitigating their impact.

Main Part. 1. Understanding Affective Respiratory Paroxysms

1.1. Clinical Classification



Cyanotic Type: The most common type, often triggered by crying. The child exhales, stops breathing, turns blue, and may briefly lose consciousness.

Pallid Type: Less frequent, usually following a sudden fright or pain, leading to bradycardia and loss of consciousness without preceding crying.

Mixed Type: Features of both cyanotic and pallid episodes.

1.2. Pathophysiology

ARPs are believed to result from a temporary dysregulation of the autonomic nervous system (ANS), particularly an overactive parasympathetic response. This leads to:

- Vagal overactivity
- Cardiorespiratory inhibition
- Brief cerebral hypoxia

In children with a predisposed emotional reactivity, immature neural control mechanisms fail to properly regulate these reflex arcs, resulting in dramatic but self-limited episodes.

2. Current Therapeutic Approaches

2.1. Observation and Parental Reassurance

Reassuring parents about the benign nature of ARPs remains the first line of management. Education reduces unnecessary emergency visits and anxiety.

2.2. Iron Therapy

Some studies have suggested a link between iron deficiency anemia and ARP frequency, and oral iron supplements have been shown to reduce episode incidence (Colina et al., 2010).

2.3. Pharmacologic Interventions

Rarely used, medications such as atropine or anticonvulsants are prescribed in severe cases but pose risks of side effects and over-treatment.

3. Bioacoustic Correction: Principles and Mechanisms

3.1. What is Bioacoustic Correction?

Bioacoustic correction (BAC) is a neuromodulatory therapy involving exposure to specially designed sound frequencies that resonate with physiological processes. These frequencies are personalized based on voice spectral analysis, EEG readings, or heart rate variability data.

3.2. Mechanism of Action

BAC stimulates the reticular activating system (RAS) in the brainstem.

- Modulates limbic system activity, which is closely tied to emotion.
- Restores autonomic balance between sympathetic and parasympathetic systems.
- Enhances neuroplasticity by encouraging adaptive reorganization of neural pathways.

In children with ARPs, BAC aims to stabilize the overactive vagal responses and strengthen cortical inhibition over brainstem reflexes.

3.3. Delivery and Duration

Sessions usually last 20–40 minutes, repeated multiple times weekly over 1–3 months.

Children wear headphones and listen to customized audio with bioacoustic patterns.

The therapy is non-invasive and painless, making it highly tolerable for pediatric patients.

4. Clinical Evidence and Outcomes



Several studies, though limited in sample size, have demonstrated positive effects of BAC in children with ARPs and related autonomic disorders:

Ivanov et al. (2018) reported a 70% reduction in ARP episode frequency in children who received BAC for 8 weeks.

Yusupova & Khalilova (2022) in Uzbekistan noted improved emotional stability, reduced crying spells, and normalized heart rate patterns in a pediatric cohort undergoing BAC.

BAC has also shown benefits in comorbid conditions such as ADHD, sleep disturbances, and anxiety, which often accompany ARPs.

Furthermore, EEG monitoring before and after BAC shows a normalization of alpha and theta rhythms, indicating better cortical regulation.

Conclusion. Affective respiratory paroxysms in children, though typically benign, can cause significant distress and may interfere with emotional and neurological development if frequent. Traditional treatments are often limited to reassurance and iron therapy. Bioacoustic correction presents a promising, evidence-based, and non-invasive modality that addresses the underlying autonomic dysfunction associated with ARPs. As research expands and clinical protocols are refined, BAC could become a valuable tool in pediatric neurology and behavioral therapy, particularly in managing emotion-triggered disorders like ARPs. Future studies with larger sample sizes and controlled designs are essential to validate its widespread application.

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