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TIC CONTROL AFTER TONSILLECTOMY: A REHABILITATION PROGRAM

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Abstract. Tonsillectomy is one of the most common surgical procedures in pediatric otorhinolaryngology, particularly for chronic tonsillitis. However, approximately 15% of patients experience neurological complications after surgery, such as tic hyperkinesias. This study examines a rehabilitation program for children with tic disorders following tonsillectomy. The program includes physiotherapy, cognitive-behavioral therapy (CBT), and nutritional support. The results demonstrate a significant reduction in tic severity among patients who underwent rehabilitation for 3, 6, and 9 months.

Keywords: tonsillitis, tonsillectomy, tics, tic hyperkinesias, rehabilitation.

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КОНТРОЛЬ ТИКОВ ПОСЛЕ ТОНЗИЛЛЭКТОМИИ: ПРОГРАММА РЕАБИЛИТАЦИИ

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Аннотация. Тонзиллэктомия является одной из самых распространённых хирургических процедур в педиатрической оториноларингологии, особенно при хроническом тонзиллите. Однако примерно 15% пациентов испытывают неврологические осложнения после операции, такие как гиперкинезы тикового характера. Данное исследование посвящено программе реабилитации для детей с тиковыми расстройствами после тонзиллэктомии. Программа включает физиотерапию, когнитивно-поведенческую терапию (КПТ) и поддерживающее питание. Результаты демонстрируют значительное снижение тяжести тиковых расстройств у пациентов, прошедших реабилитацию через 3, 6 и 9 месяцев.

Ключевые слова: тонзиллит, тонзиллэктомия, тики, гиперкинезы тикового характера, реабилитация.

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INTRODUCTION

Tonsillectomy is widely used to treat chronic tonsillitis and recurrent sore throats. However, postoperative complications, such as tic hyperkinesias, require special attention. Inflammatory processes following surgery can affect the nervous system by increasing pro-inflammatory cytokine levels and altering neurotransmission. This study proposes a comprehensive rehabilitation program aimed at minimizing these effects.

The development and justification of a rehabilitation program for patients with tic disorders after tonsillectomy that was aimed at minimizing the negative postoperative consequences improved overall patient well-being and enhanced quality of life. The effectiveness of a specialized rehabilitation

program, which includes physiotherapy, cognitive-behavioral therapy (CBT), and nutritional support, has shown positive outcomes in children with tic disorders.

Surgical operations, particularly in children and adolescents, can be a significant stress factor, potentially exacerbating tic severity. Rehabilitation programs help stabilize the patient's emotional state, reduce anxiety, and prevent symptom aggravation. The rehabilitation of patients with tic disorders after tonsillectomy should be comprehensive, incorporating pharmacological, physiotherapeutic, psychotherapeutic, and supportive care. An individualized approach for each patient allows for a reduction in tic severity, faster recovery, and an overall improvement in quality of life.

MATERIALS AND METHODS

The study involved 40 children (ages 6 to 18) who underwent tonsillectomy. Following surgery, all patients exhibited tic disorders of varying severity, necessitating their inclusion in a rehabilitation program. Participants were divided into three groups based on the duration of rehabilitation: 3 months (15 patients), 6 months (15 patients), and 9 months (10 patients). Tic severity was assessed using the Yale Global Tic Severity Scale (YGTSS) before the rehabilitation program and after 3, 6, and 9 months from treatment (Table 1).

Laser therapy is a physiotherapeutic method that utilizes low-intensity laser radiation to stimulate metabolic processes and promote tissue regeneration. In this rehabilitation program, an infrared laser with a wavelength of 890–950 nm was used. The procedure involved: 1) Laser application to the posterior pharyngeal wall and cervical-collar zone 2) Pulsed mode for a gentle physiological effect 3) A session duration of 5–7 minutes. The treatment course consisted of 10–12 sessions every other day, with an additional course scheduled at 3, 6, and 9 months if necessary. This rehabilitation protocol contributed to the development of an algorithm, which is outlined in subsequent steps. To evaluate the effectiveness of each rehabilitation stage, different treatments were assigned to each group, and the results were compared in terms of tic reduction.

Cognitive-Behavioral Therapy (CBT) is a psychotherapeutic method aimed at helping patients develop conscious control over tic movements and modifying emotional and behavioral responses that contribute to their intensification. The core CBT components included:

1. Psychoeducation – explaining tic formation mechanisms and aggravating factors to patients and their parents.
2. Habit Reversal Training – teaching patients and parents substitute movements to manage tics.
3. Cognitive Restructuring – addressing anxiety and negative thoughts associated with tics.
4. Relaxation Techniques – including breathing exercises.

The treatment program lasted 12 weeks and included both individual and group sessions. The first 6 weeks consisted of weekly sessions, followed

by biweekly sessions. The most significant CBT effects were observed in adolescents (ages 10–18), as their more developed cognitive abilities allowed for better application of behavioral control strategies.

Nutritional support aimed to compensate for deficiencies in micronutrients involved in nervous system regulation and to correct metabolic imbalances that could exacerbate tics. The main components included:

- 1) Magnesium and Vitamin B6 – essential for neurotransmitter balance and reducing nervous excitability.
- 2) Omega-3 Fatty Acids – support central nervous system function and have anti-inflammatory effects.
- 3) Prebiotics and Probiotics – promote gut microbiota restoration, which influences neuropsychological functions.

The nutritional protocol involved individualized diet therapy with an increased intake of magnesium-rich foods, B vitamins, and fatty acids, along with a 3-month probiotic course. Micronutrient levels were monitored and dietary adjustments were made every 3 months. Nutritional support showed the greatest effectiveness in adolescents (ages 15–18) due to their higher metabolic demands and potential micronutrient deficiencies caused by rapid growth.

Rehabilitation Algorithm

1. Physiotherapy: Includes laser therapy.
2. Cognitive-Behavioral Therapy (CBT): Training in tic self-control and relaxation techniques.
3. Nutritional Support: Correction of magnesium and vitamin B6 deficiencies, probiotic supplementation.
4. Follow-up Examinations: Conducted every 3 months with adjustments to the rehabilitation plan as needed.

CONCLUSION

1. The specialized rehabilitation program significantly reduces tic severity in children following tonsillectomy.

2. After 3 months, tics decreased by 50%; after 6 months, by 68%; and after 9 months, by 88%. (Table 2, Graph 1)

3. The best outcomes were observed in older children when CBT and nutritional support were

All applicable international, national, and/or

Table 1.

Age Groups of Patients and Types of Rehabilitation

Age Group	Number of patients	Physiotherapy (%)	CBT (%)	Nutritional Support (%)
6-9 y. o.	10	50	30	20
10-14 y. o.	15	40	40	20
15-18 y. o.	15	30	50	20

CBT - Cognitive-Behavioral Therapy

Table 2.

Dynamics of YGTSS Score Reduction After Rehabilitation

Rehabilitation Period (month)	Average YGTSS score (max 50)
0	45
3	22
6	18
9	5

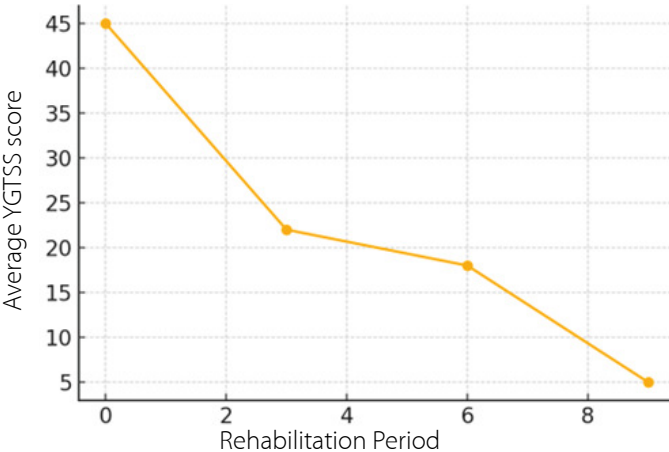
included. (Table 1)

4. Laser therapy proved particularly effective in younger children (ages 6–9), as their nervous system is in an active developmental stage and responds well to physiotherapeutic interventions (Table 1).

The treatment of tics associated with chronic tonsillitis requires a comprehensive approach, including pharmacotherapy, psychological support, physiotherapy, and dietary adjustments. While pharmacological methods can effectively reduce symptom severity, their use must be approached with caution due to potential side effects. Cognitive-behavioral therapy (CBT) helps patients develop self-regulation skills and adapt to social environments. Physiotherapeutic methods, such as laser therapy and massage, improve neuromodulation and alleviate symptoms. Nutritional support stabilizes the nervous system by addressing micronutrient deficiencies. Social and psychological assistance plays a key role in creating a supportive environment, contributing to the patient’s emotional well-being. Thus, long-term monitoring and a multidisciplinary approach are essential factors in the successful

Graph 1.

Dynamics of YGTSS Score Reduction After Rehabilitation



treatment of tics.

CONFLICT OF INTERESTS

The authors declare the absence of obvious and potential conflicts of interest related to the publication of this article.

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AVAILABILITY OF DATA AND MATERIALS

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All authors contributed to the design and interpretation of the study and to further drafts. All authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All applicable international, national, and/or institutional guidelines for the care and use of animals were followed.

CONSENT FOR PUBLICATION

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ИСТОЧНИКИ ФИНАНСИРОВАНИЯ

Авторы заявляют об отсутствии финансирования при проведении исследования.

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ВКЛАД ОТДЕЛЬНЫХ АВТОРОВ

Все авторы внесли свой вклад в подготовку исследования и толкование его результатов, а также в подготовку последующих редакций. Все авторы прочитали и одобрили итоговый вариант рукописи.

ЭТИЧЕСКОЕ ОДОБРЕНИЕ И СОГЛАСИЕ НА УЧАСТИЕ

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СОГЛАСИЕ НА ПУБЛИКАЦИЮ

Не применимо.

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Журнал "Евразийский журнал оториноларингологии - хирургии головы и шеи" сохраняет нейтралитет в отношении юрисдикционных претензий по опубликованным картам и указаниям институциональной принадлежности.

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