

PREVALENCE, ETIOLOGY AND TREATMENT OF PSYCHOGENIC APHONIA IN CHILDREN - A CASE REPORT

AUTHORS

Mirjana Petrović-Lazić¹, Ivana Ilić-Savić¹

¹ Faculty of Special Education and rehabilitation, University of Belgrade

KORESPONDENT

Ivana Ilić-Savić

Fakultet za specijalnu edukaciju i rehabilitaciju, Univerzitet u Beogradu

ivana.ilic558@gmail.com

SUMMARY

Introduction. Emotions are one of the most important psychological processes, with a decisive influence on a person's voice. Faced with the great challenges and changes that primary and secondary socialization agents impose in the process of growing up, children consequently experience a spectrum of various unpleasant feelings: anxiety, fear, anger, frustration and sadness. Due to the fast-paced lifestyle, it often happens that the child ignores unpleasant feelings, which further worsens the condition in which he finds himself. Among other conditions, psychogenic aphonia in children has become more frequent in recent years. The current case report aims to determine the frequency of psychogenic aphonia in children, to identify the most common causes that lead to psychogenic aphonia and highlight the methods of vocal treatment that give the best results during rehabilitation.

Case report. The current paper presents the results collected in a two-year period at the Clinic for Ear, Throat and Nose of the Clinical Hospital Center "Zvezdara". In the period from March 2017 to May 2019, psychogenic aphonia was diagnosed in 31 patients, which is an evident increase compared to the previous ten-year period in which psychogenic aphonia was diagnosed in 38 younger patients. Analyzing heteroanamnestic data obtained from parents, the most common answer about the cause of psychogenic aphonia is dissatisfaction with school success. After successful diagnostics by an otorhinolaryngologist, psychiatrist and vocal pathologist, in the process of rehabilitation of psychogenic aphonia, methods of digital manipulation of the larynx, methods of restoring the voice with cough reflex and methods of turning out the feedback system were applied. In this particular case, the method of digital manipulation of the larynx gave the best results.

Conclusion. Optimal evaluation of patients with voice disorders requires the joint efforts of experts from different disciplines. Having in mind the tendency of recurrence of psychogenic aphonia, these findings suggest that the integration of the interventions of a vocal pathologist and a psychiatrist could give effective results in the process of rehabilitation voice.

Key words: psychogenic aphonia, etiology, treatment, prevalence, children

SRPSKI

PREVALENCIJA, ETIOLOGIJA I TRETMAN PSIHOGENE AFONIJE KOD DECE

Mirjana Petrović-Lazić¹, Ivana Ilić-Savić¹

¹ Fakultet za specijalnu edukaciju i rehabilitaciju, Univerzitet u Beogradu

SAŽETAK

Uvod. Jedan od veoma važnih psihičkih procesa, sa presudnim uticajem na glas čoveka jesu emocije. Suočeni sa velikim izazovima i promenama koje primarni i sekundarni agensi socijalizacije nameću u procesu odrastanja, deca posledično doživljavaju spektar različitih neprijatnih osećanja: anksioznost, strah, bes, frustriranost i tugu. Zbog ubrzanog načina života, mnogo puta se dešava da dete ignoriše neprijatna osećanja što dodatno pogoršava stanje u kojem se nalazi. Poslednjih godina primetna je sve učestalija psihogena afonija kod dece. Aktuelni prikaz slučaja ima za cilj da utvrdi učestalost psihogenih afonija kod dece, da izdvoji najčešće uzroke koji dovode do psihogene afonije i istakne metode vokalnog tretmana koje daju najbolje rezultate u toku rehabilitacije.

Prikaz slučaja. U aktuelnom radu prikazani su rezultati koji su prikupljeni u dvogodišnjem periodu na Klinici za uho, grlo i nos KBC "Zvezdara". U periodu od marta 2017. do maja 2019. godine, psihogena afonija je dijagnostikovana kod 31 pacijenta što je evidentan porast u poređenju sa prethodnim desetogodišnjim periodom u kojem je dijagnostikovana psihogena afonija kod 38 pacijenata mlađeg uzrasta. Analizirajući heteroanamnesticke podatke dobijene od roditelja najučestaliji odgovor o uzroku

psihogene afonije je nezadovoljstvo uspehom u školi. Nakon uspešno izvršene dijagnostike od strane otorinolaringologa, psihijatra i vokalnog patologa, u procesu rehabilitacije psihogene afonije primenjene su metode digitalne manipulacije larinksa, metode vraćanja glasa refleksom kašlja i metoda iskrućenja feedback sistema. U konkretnom slučaju najbolje rezultate dala je metoda digitalne manipulacije larinksa.

Zaključak. Optimalna evaluacija pacijenata sa poremećajima glasa zahteva udružene napore stručnjaka iz različitih disciplina. Imajući u vidu recidive psihogene afonije, ova otkrića sugerišu da bi integracija intervencija vokalnog patologa i psihijatra mogla dati efikasne rezultate u procesu rehabilitacije glasa.

Ključne reči: psihogena afonija, etiologija, tretman, prevalencija, deca

INTRODUCTION

The voice is a source of information about our subjective states and is a reflection of specific life circumstances. The voice is the most important instrument of communication in humans. From an evolutionary, social and psychological point of view, the voice is the most important means of expressing one's identity, state of mind and emotions [1].

Recognition of the human voice is the first ability with which a newborn is born, because the first connection between mother and baby is exclusively vocal [2]. The newborn first recognizes the mother's voice, long before recognizing the face or touching it. Also, it slowly begins to explore its voice, modifying the sound in order to meet basic needs. At about 4 months of age, babies begin to produce sounds reminiscent of singing, showing their sense of satisfaction. At 6 months, babies begin to repeat simple syllables when sucking or falling asleep. In this way, vocal processes reflect all stages of development, physical and mental [3].

Vocalization is considered to be essentially related to language, but vocalization is more than language. This is supported by the fact that by changing the quality of the voice in certain elements of the speech, we can change the meaning of that statement. For example, if we say a sentence sarcastically or change the accent in a word, we can change its meaning [2]. Evolutionarily, the elements of nonverbal communication as factors of everyday speech preceded the emergence of language and contributed to its development [4].

Emotions create neurochemical transmissions that affect all organ systems. Thus, emotions directly affect the mechanical processes of phonation. Emotions such as anger are associated with "sudden movements of the muscles of the articulatory organs", emotions of happiness with "slow, flexible movements of the orofacial muscles", and sadness with "progressive relaxation of the muscles of the tongue and soft palate". These findings are in line with empirical research by vocal pathologists who point out that emotionally dissatisfied individuals may have a hoarse, hoarse, trembling, weak or tense voice [5]. In this way, by careful perception of the voice, we can recognize some basic emotions from the voice, such as happiness, sadness, anger and fear [2].

Neurobiological studies point out that phonation is largely associated with changes at all cerebral levels, from the brainstem to the cortex. Accordingly, the new changes in the functioning of the limbic system of the brain will affect the activity of the vocal folds. This would mean that any psychological trauma could potentially affect voice quality through its effects on the limbic system of the brain [6].

Traumatic events can affect the physiological functions of the respiratory system leading to deep and irregular breathing [7]. By affecting one's breathing, traumatic events can contribute to the appearance of vocal damage in the absence of laryngeal pathology. As a consequence, there is a

tightening of the vocal cords, which impairs the quality of the voice and which is called "psychogenic aphonia" [8].

Psychogenic aphonia is a disorder of the voice that occurs suddenly, and manifests as the inability of a person to generate sound, although there is no organic change in the vocal folds. Psychogenic aphonia occurs in 0.4% of the general population and is eight times more common in women [9]. The prevalence of psychogenic aphonia is more common in children and is estimated at about 6% [10]. What distinguishes these patients from functional voice disorders, which also do not have an organic basis in the vocal folds, is the preserved cough reflex, while at the same time the phonation is automatically damaged [1].

Psychogenic aphonia is a voice disorder that develops gradually as a result of disturbed psychological processes that lead to chronic patterns of laryngeal muscular dysfunction [1]. Throughout history, there have been various names for this disorder, for which the term psychogenic aphonia is common today. This disorder presents a major challenge for researchers and experts in the field of voice disorders, largely due to its multiple etiologies and variable symptoms. Thanks to the progress of science and technology, vocal pathologists, in cooperation with a multidisciplinary team of experts, manage to reach a final and safe diagnosis [1].

Significant information has been found in the literature that confirms the hypothesis of the influence of the psyche on phonation [2-4,9]. Since the voice can convey such complex information about an individual, in this research we ask whether the voice can also serve as a non-verbal marker of the trauma experienced by a child. The aim of the case report is to determine the frequency of psychogenic aphonia in children, to identify the most common causes that lead to psychogenic aphonia and to determine the methods of vocal treatment that give the best results during rehabilitation.

CASE REPORT

At the Clinic for Ear, Throat and Nose KBC "Zvezdara" in a time interval of two years, there were 31 patients diagnosed with psychogenic aphonia, aged 7 to 15 years, both sexes, 7 boys (22.6%) and 24 girls (77.4 %) Table 1. Patients in whom aphonia was associated with organic components also occurred during this interval, but they did not enter into further analysis of this case study. Detailed clinical examinations were first performed by psychiatrists and otorhinolaryngologists. In this way, the initial classification of these patients was performed, after which the vocal rehabilitation began on the same day. Since the prevalence of psychogenic aphonia is more frequent in women than the total number, as expected, most girls. Comparing the total number of diagnosed psychogenic aphonia in children in the previous ten-year period, an increase in the number of reported cases is obvious.

Table 1. Sample structure in relation to gender and age

	Male	Female	Total
Sex	7 (22.6%)	24 (77.4%)	31(100%)

The duration of aphonia means the time from which the child lost his voice to the return of the voice. According to the records of our clinic, the largest number of patients consulted a doctor within 7 days from the day the problem appeared (Table 2). After a seven-day aphonia, parents and the environment became seriously concerned. Most of the children's parents thought that the child was joking, that everything was part of the child's game and that the voice would return. The observation that the child can no longer perform even his favorite activities such as imitation, singing, and phone calls, led the parents to give their children some antibiotics to help them. Analyzing the heteroanamnesic data obtained by the family, we learn that the loss of the voice was preceded by an unpleasant event. While playing in the yard of the house, the boy found matches. Out of curiosity, he lit a match and accidentally set fire to his pants. The incident ended happily, but two weeks after this event, watching the flames in one movie, the child was left without a voice. From the personal and family anamnesis, we learn that there is no heredity for voice and speech disorders in the family, that the prelingual and lingual period of the child went smoothly. Parents also deny the presence of the disease or the use of oral speech aids.

Table 2. Duration of psychogenic aphonia in patients

Duration of afonia	Number of patients	Percentages
to 3 days	1	3.3%
to 7 days	20	64.5%
to 15 days	8	25.8%
over 15 days	2	6.4%

In order to describe in more detail the symptomatology of psychogenic aphonia, we will describe in more detail one example from our case study. Patient M.L. At the age of 9, he reported to the Ear, Nose and Throat Clinic of the Zvezdara Clinical Hospital due to loss of voice. Loss of voice in this patient led to a depressed mood, loss of interest in the environment and inability to function normally in a social environment. After a detailed anamnesis and medical examination by a vocal pathologist, otorhinolaryngologist and psychiatrist, data were obtained indicating that the patient had not produced any sound for more than a month, had been treated and hospitalized several times, and had been treated with heterogeneous pharmacotherapeutic procedures. From the anamnestic data, we learn that the boy did not regain his voice at the premorbid level of functioning. The findings of the otorhinolaryngologist show that the child has normal hearing, vocal folds without organic etiology and well-functioning orofacial muscles. On psychiatric status, the psychiatrist observes cyclothymic disorder.

At the admission to our institution, the patient is aware, cooperates and establishes eye contact. Attention is focused on the contents related to his current situation. The patency of the oronasal cavity is preserved. Breathing is shallow and fast. The function of the cranial nerves that provide motor and sensory innervation of the muscles of the vocal tract is within normal limits. Tension of the muscles of the vocal tract is noticed. Comprehension is preserved at the level of complex sentences. Graphoexpression is ripe for age. We notice episodes of fear and anxiety in the child's behavior. After a detailed anamnesis, analysis of heteroanamnesic data obtained from parents and successful exploration of a multidisciplinary team of experts (otorhinolaryngologist,

psychiatrist and vocal pathologist), we found that the boy has psychogenic aphonia. On the same day, we started the vocal rehabilitation of the patient. In the process of rehabilitation of psychogenic aphonia in this patient, we applied the method of digital manipulation of the larynx. By applying external pressure to the larynx, we tried to help the patient generate a voice. We press the thyroid cartilage with our thumb and forefinger. By external action, we move the thyroid cartilage backwards and shorten the vocal folds. By shortening the vocal folds, their mass and size increase, which removes the tension of the laryngeal musculature and worsens the conditions for phoning. This procedure led to the creation of the basic laryngeal tone. By applying digital manipulation, the boy's voice returned in our first session.

In addition to the digital manipulation we applied in this particular case, in the two-year period of our case study, we also used the cough reflex method and the feedback system off method. Analyzing the success of vocal rehabilitation of the voice in children using the method of digital manipulation, the method of cough reflex and the method of turning off the feedback system, we came to the conclusion that the best result was given by the method of digital manipulation (Table 3).

Table 3. Success of vocal therapy in patients with psychogenic aphonia

Voice rehabilitation method	Number of treatments applied	Number of successful patients	Performance percentage
Method digital laryngeal manipulation	1-2	19	61.2%
Method cough reflex	6-8	9	29%
Method shutting down feedback system	9-12	3	9.8%

In order to determine the causes of psychogenic aphonia in our case sample, we compared heteroanamnesic data of parents (Table 4). Analyzing their answers, we came to the conclusion that the most common answer to which the cause of psychogenic aphonia is attributed is dissatisfaction with school success. We notice a feeling of guilt in the behavior of parents due to the condition in which their child is. Some parents have even admitted that they have insisted on additional learning with their children in the past. Analyzing the sample of our case study, we can notice that our sample consisted mainly of children who, in addition to regular school, also attended a foreign language school and a school of music education.

Table 4. Identification of the causes of psychogenic aphonia based on heteroanamnesic data

Cause	Number of patients	Percentages
Unknown cause	10	32.2%
Stress	9	29%
Dissatisfaction with school success	12	38.8%

All patients included in this study returned their voice to a satisfactory level. After the end of the vocal therapy, they were referred to school psychologists for further stabilization. Further psychological therapy should help them overcome the causes of psychogenic aphonia and thus avoid relapses.

DISCUSSION

This paper presents the results of two - year follow - up of pediatric patients with psychogenic aphonia. In the period from March 2017 to May 2019, psychogenic aphonia was

diagnosed in 31 patients, which is an evident increase compared to the previous ten-year period in which psychogenic aphonia was diagnosed in 38 younger patients. The reason for this increase can be attributed to the great challenges and changes that primary and secondary socialization agents impose in the process of growing up. In recent years, inadequate parenting styles have been noticed in counseling work, which include idealizing children's abilities by requiring them to be the best at what they do. As a result of the inability to achieve what parents ask of them, children experience a range of different unpleasant feelings: anxiety, fear, anger, frustration and sadness. Due to the fast-paced lifestyle, it often happens that the child ignores unpleasant feelings, which further worsens the condition in which he finds himself. Among other conditions, psychogenic aphonia in children has become more frequent in recent years [9]. Analyzing the results of this study, we conclude that these results are consistent with the results of our study, which confirms the increased number of cases of psychogenic aphonia in children.

The causal relationship between psychosocial factors and voice disorders has not yet been sufficiently investigated. A recent study that investigated the correlation between trauma and acoustic parameters of phonation showed that psychological stress after trauma was significantly associated with voice quality [12]. These preliminary results confirm the current case report of children who lost their voice after trauma and indicate the importance of studying the acoustic parameters of the voice by looking at them as potential nonverbal markers of childhood trauma.

When traumatic experiences occur, they affect the child's psyche, but also the body. Previous research points out that physiological responses to trauma change over time, especially if the trauma lasts for a long period of time [13-15]. Trauma during childhood can lead to changes in the functional properties of the vocal folds, which if left untreated can contribute to psychosocial disorders in adulthood [16], which makes it necessary to conduct timely voice rehabilitation. This is supported by the fact that prolonged exposure to trauma is associated with risky physiological and health outcomes such as immunosuppression [14].

Many studies have confirmed the suspicion that traumatic events disrupt proper breathing and indirectly alter voice characteristics, in some cases contributing to clinical voice disorders [7-8, 17] such as conversion or psychogenic aphonia [17]. Research on the correlation between voice quality and anxiety led to the conclusion that anxiety affects phonation leading to deep and shallow breathing [18]. By changing the breathing technique, the basic frequency of the voice and the frequency of pauses in phonation are reduced. This supports the fact that speech disorders in speech caused by high levels of anxiety lead to vulnerability of the organism and encourage the development of benign voice disorders [19]. In this particular case, our patient has shallow and rapid breathing when receiving, shows a high level of anxiety and cyclothymic behavior resulting from prolonged trauma.

Speech therapy is important in the approach to the treatment of psychogenic voice disorders. It can be direct or indirect. The goal of psychogenic aphonia therapy is the primary restoration of the voice [8]. Since restoring the voice has a positive effect on the child's mental state, the therapy is initially symptomatic. Symptomatic therapy is preferred in order to restore the voice in the shortest possible time, which would help the child regain self-confidence and take social part. It is important to emphasize that the state of psychogenic aphonia can return, and regardless of the premorbid state of the voice, one must work on vocal hygiene of the voice and its application [20]. At the same time, research shows that vocal therapy is not sufficient for successful rehabilitation and resocialization of children with psychogenic aphonia [18, 21-23]. Namely, the loss of voice is a consequence of psychological imbalance. With that in mind, it is necessary to treat the primary problem first, and then the secondary one. Accordingly, in the current case study after the end of vocal therapy, all patients were referred to school psychologists for further assessment and stabilization.

CONCLUSION

Psychogenic aphonia in children is a kind of enigma in the field of voice disorders. The current case report shows that psychogenic aphonia in children has been on the rise in recent years and confirms the hypothesis that psychogenic aphonia is a nonverbal marker of child trauma. Looking at the case study we presented in this paper, we conclude that psychogenic aphonia in most children occurs as a consequence of excessive care due to the obligations imposed by the school system. Excessive pressure from the environment in a child awakens an obsessive need for success. Comparing the effects of vocal treatment using the digital manipulation method, the cough reflex method and the feedback system exclusion method, the digital manipulation method gave the best results in this study. The therapy of psychogenic aphonia is complex and long-lasting with the possibility of worsening or recurrence of symptoms, which imposes the need to include a multidisciplinary team of experts in the evaluation and rehabilitation process in order to better understand and treat psychogenic aphonia in children. Since previous research in children confirms the connection between emotions and phonation, it is very important to take the necessary measures to assess mental health, prevent psychological problems and timely treatment of these children.

THANK-YOU NOTE

The work was created as a result of research within the project "Evaluation of the treatment of acquired speech and language disorders" (ON 179068) funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

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