Neuropsychıatrıc dısorders assocıated wıth chıldhood ımmunologıc dysfunctıon

Zaburzenia neuropsychiatryczne związane z dysfunkcjami immunologicznymi wieku dziecięcego

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Abstract

Wstęp. Omawiane jednostki chorobowe są znane jako dziecięce zespoły neuropsychiatryczne, ponieważ opisano, że patogeny zakaźne inne niż paciorkowce są również związane z objawami neuropsychiatrycznymi. Pediatryczne autoimmunologiczne zaburzenie neuropsychiatryczne są związane z zakażeniem paciorkowcami (PANDAS) i pediatryczny zespół neuropsychiatryczny o ostrym początku (PANS).

Cel. Celem pracy była ocena zaburzeń neuropsychiatrycznych związanych z dysfunkcjami immunologicznymi w dzieciństwie.

Przegląd. PANS/PANDAS odnosi się do ostrego i dramatycznego początku zespołu neuropsychiatrycznego u dzieci, w tym OCD i/lub tików. Przypuszcza się, że jest on wynikiem reakcji autoimmunologicznej na jądra zwojów podstawy mózgu, zapoczątkowanej przez infekcję paciorkowcami grupy A. Badania wskazują na reakcje neurozapalne w zwojach podstawy mózgu i powiązanych sieciach.

Wnioski. Ocena strategii leczenia PANS/PANDAS pozostaje wyzwaniem, ponieważ jest to rzadka choroba z kilkoma opublikowanymi badaniami wysokiej jakości. Niewiele wiadomo o jej etiologii, metodach diagnostycznych, sposobach leczenia lub długoterminowych skutkach. Jednakże, ponieważ setki dzieci i rodzin cierpią z powodu wyniszczających skutków choroby, choroby zakaźne powinny być dokładnie oceniane pod kątem PANS/PANDAS, szczególnie w pe-

diatrycznej grupie wiekowej. Nawet w przypadku braku dowodów, na których można oprzeć interwencje, w zakresie zaawansowanej praktyki pielęgniarskiej leży zapewnienie opieki psychoterapeutycznej z empatyczną perspektywą dla dzieci i rodzin borykających się z frustracją, strachem i niepokojem, spowodowanym chorobą.

Słowa kluczowe: PANS, PANDAS, dziecko, dysfunkcja neurologiczna, psychiatria, pielęgniarstwo

Summary

Introduction. These disease entities are known as pediatric neuropsychiatric syndromes because infectious pathogens other than streptococci have also been reported to be associated with neuropsychiatric symptoms. Pediatric autoimmune neuropsychiatric disorder associated with streptococcal infection (PANDAS) and pediatric acute-onset neuropsychiatric syndrome (PANS).

Aim. The aim of this study was to evaluate neuropsychiatric disorders associated with immunologic dysfunction in childhood.

Overview. PANS/PANDAS refers to the acute and dramatic onset of a neuropsychiatric syndrome in children, including OCD and/or tics. It is believed to be the result of an autoimmune reaction to the basal ganglia nuclei, initiated by infection with group A streptococci. Studies indicate neuroinflammatory reactions in the basal ganglia and related networks.

Conclusions. Evaluating treatment strategies for PANS/PANDAS remains a challenge because it is a rare disease with few published high-quality studies. Little is known about its etiology, diagnostic methods, treatments or long-term effects. However, as hundreds of children and families suffer from the debilitating effects of the disease, infectious diseases should be carefully evaluated for PANS/PANDAS, especially in the pediatric age group. Even in the absence of evidence on which to base interventions, it is within the scope of advanced nursing practice to provide psychotherapeutic care with an empathetic perspective to children and families struggling with the frustration, fear and anxiety caused by illness.

Keyword: PANS, PANDAS, child, neurological dysfunction, psychiatric, nursing

Introduction

Diagnostic criteria for PANS are defined as sudden onset of OCD or severely restricted food intake and the presence of at least two of the following seven categories anxiety; emotional lability and/or depression; irritability, aggression and/or excessive defiant behavior; behavioral (developmental) regression; impaired school performance (related to attention deficit hyperactivity disorder); pattern-like symptoms, memory deficits, cognitive changes; sensory or motor abnormalities; somatic signs and symptoms sleep disturbances, enuresis or increased urinary frequency. These symptoms can overlap with a variety of disorders including tic disorders, OCD, ADHD, depression and bipolar disorder, but the distinguishing feature is the simultaneous acute onset across multiple domains. The differential diagnosis includes OCD, anorexia neurosis, avoidant or restrictive food intake disorder, tic disorders, transient tic disorder, bipolar disorder, Sydenham's blindness, autoimmune encephalitis, systemic autoimmune condition and Wilson's disease. Diagnostic criteria for PANDAS should include all of the following: Presence of OCD or tic disorder; onset before puberty; intermittent– recurrent pattern; associated with group A streptococcal infections at onset; associated with neurologic abnormalities such as motor hyperactivity or choreiform movements.

Given the proposed etiology and pathogenesis of PANDAS/PANS, several additional treatment modalities have been identified, including treatment of its infection, prophylactic antibiotics and tonsillectomy, as well as immunomodulating therapeutic modalities such as intravenous immunoglobulin. Treatment of PANS involves a three-pronged approach: psychotherapy, antimicrobial prophylaxis and immunomodulatory therapy. During exacerbations, special adjustments to the patient's daily routine are required as part of psychotherapy. Individual and group support should also be offered to family members. Regarding specific treatments for neuropsychiatric symptom groups, for cases with tics (present in 70% of patients), comprehensive behavioral psychotherapy or habit reversal therapy is recommended. Treatment options for PAN-

DAS include adenotonsillectomy, antibiotic therapy, intravenous immunoglobulin therapy and cognitive behavioral therapy.

Aim

The aim of this study was to evaluate neuropsychiatric disorders associated with immunologic dysfunction in childhood.

Overview

Some childhood neuropsychiatric syndromes have occurred since 1980 in the world, but such syndromes have been merged under the title of PANDAS (pediatric autoimmune neuropsychiatric syndrome associated with streptococcal infections) in 1998. As a result of the similarity of the antigenic structure of Group A streptococci to neuron proteins, it has been claimed that the disease may occur with the formation of antibodies and the initiation of an autoimmune response. Childhood-onset obsessive compulsive disorder (OCD) or tic disorders associated with acute Group A beta-hemolytic disorders (PANDAS) should be evaluated for pediatric autoimmune neuropsychiatric disorders. In particular, the dramatic onset or exacerbation of the disease should be considered as an important finding [1].

Both obsessive-compulsive disorder (OCD) and tic disorders often occur in childhood [2]. Tics are defined as rapid, recurrent, non-rhythmic, and stereotypical motor or vocal movements. These behaviors are often impulsive. Tic disorders which are generally a disorder in childhood and adolescence occur between 2-7 years old in chronic forms. The period in which the symptoms are most severe is the pre-adolescence (9-12 years old) period [3]. The onset, which is unusually sudden, is accompanied by a range of neuropsychiatric symptoms in some pediatric OCD cases. This syndrome was known as Pediatric Acute Neuropsychiatric Syndrome (PANS) [4,5]. This abrupt onset occurs during or after the manifestation of symptoms of the infectious disease, which has led to consideration of immune-mediated pathogenesis [6].

Among the diagnostic criteria for PANS, the presence of acute OCD symptoms, restriction in food intake, and at least two of the following criteria are required. These criteria are as follows: anxiety; neuroticism and/or depression; nervousness, aggression, and/or oppositional defiant behaviors; behavioral (developmental) regression; impaired school performance (related to attention deficit hyperactivity disorder), disorganized symptoms, memory problem, cognitive distress; sensory or motor abnormalities; somatic symptoms, sleep disturbances, enuresis, or increased urinary frequency. These symptoms may overlap with various disorders such as tic disorders, OCD, attention deficit hyperactivity disorder, depression, and bipolar disorder, but the distinctive feature is the simultaneous acute onset in multiple areas. The differential diagnosis includes OCD, anorexia nervosa, avoidant or restrictive food intake disorder, tic disorders, transient tic disorder, bipolar disorder, Sydenham's chorea, autoimmune encephalitis, a systemic autoimmune condition, and Wilson's disease [7].

Functional and structural abnormalities in the cortico-basal ganglia circuit have been detected in OCD and tic disorders. Pathological abnormalities in the striatum have also been detailed in PANDAS. It has been found that the patients with PANDAS had enlarged striatal volume. It has been reported that patients with PANDAS and Tourette Syndrome have had striatal inflammation that was measured by positron emission tomography using a microglial activation marker [8]. It has been observed that monoclonal antibodies in patients react with the surface of neuron cells and cross-react with N-acetyl-beta-D-glucosamine and lysoganglioside, which are group A carbohydrate epitopes are effective in the occurrence of Sydenham's chorea. The reason can be the possible immune response in the basal ganglia. On the other hand, it is thought that antibodies that pass the blood-brain barrier increase antibody-mediated cell signaling and trigger dopamine release in the caudate putamen region of the brain, which leads to movement disorder [3].

Diagnostic criteria for PANDAS can be considered as the presence of OCD or tic disorder; prepubertal onset; intermittent-repetitive circle;

the presence of group A streptococcal infections at the onset; Neurological abnormalities such as motor hyperactivity or choreiform movements. These criteria are the criteria that should be carefully evaluated in terms of PANDAS [7]. In addition to tics, attention deficit hyperactivity disorder (ADHD), obsessive-compulsive disorder (OCD), and anxiety are considered as the most common comorbidities. Tics disrupt the daily routine activities of some children and cause social embarrassment and social isolation. Behavioral therapies are used in addition to drugs in the disease process [7].

It is important for children to understand whether tics are irritating or depressing. If these tics disturb and make children upset and cause both social embarrassment and interfere with school or activities these children should be treated [7].

Many neurological and psychiatric conditions have a growth and decline process. PANDAS has a relapse period, so streptococcal testing may be diagnostic when tics or obsessive-compulsive disorder symptoms worsen in the absence of fever or other illness. During relapse symptoms in PANDAS, patients must have 'motoric hyperactivity and random movements', even if the obsessive-compulsive disorder is not essential. These incidental movements may include "choreiform movements" but not "open chorea" [7]. In a study that has been recently published, it has been determined that PANS cases frequently have indicated the signs of anxiety and emotional lability; and sleep problems and decreased school success, attention deficite, irritability, and increased motor activity have been observed more frequently than other findings.

It is clear to say that obsessions with contamination or harming others are common in patients with PANS. Furthermore, it has been observed that compulsive behaviors (such as make-and-correction and symmetry) have frequently appeared. Neuropsychiatric symptoms progressed with relapses during the periods of infection, and these symptoms have observed to regress when the infection regressed [9,10].

Although the pathogenesis of PANDAS has not been fully detailed, the clinical similarity with Syndenham's chorea has revealed the pro-

posed model in the pathogenesis of PANDAS. The pathogenesis of Sydenham's chorea after AGBHS infection is also unknown; however, the molecular mimicry mechanism plays an important role in pathogenesis. Considering this mechanism, cross-reactions occur between the cell membranes of streptococci and the nucleus caudate and nucleus subthalamic in the central nervous system. PANDAS symptoms occur after streptococcal infection, and subsequent sudden and dramatic deterioration supports the immune response model [11,12] According to [5], only tics and OCD may occur in children if the dose of the etiological agent is not enough to cause the development of chorea.

Although the incidence and prevalence of PANDAS are not known clearly, some researchers report that childhood-onset OCD and tic disorder have an effect at the rate of 10%. PANDAS is more common in boys than [12].

It peaks in the 2-year-old age group in childhood and adolescence. However, the symptoms of typical OCD are gradual and usually postpubertal. These patients have better results than treatment. OCD is often chronic, but in PANDAS the symptoms are fluctuating (ascending or decreasing).

Before treatment, it is essential to conduct a comprehensive but individualized assessment, including a complete medical history, extensive anamnesis, and supplemental testing to overcome other diseases [13]. The main diagnosis of the disease is made by the presence of clinical signs. However, throat culture and antistreptococcal antibodies support the diagnosis in terms of demonstrating that the disease is associated with AGBHS. While Anti-DNase B (ADB) titers increase in 80% of PANDAS cases, antistreptolysin O (ASO) titers increase only in 20-50% of cases [12].

The treatment process of PANDAS includes three approaches such as psychotherapy, antimicrobial prophylaxis, and immunomodulatory therapy. It is important to tailor the patient's daily life as part of psychotherapy during relapse. Both individual and group therapy can be applied to family members. Among the therapeutic interventions, the

method used based on inhibiting responses is cognitive behavioral therapies. Initially, serotonin reuptake inhibitors can be used to manage symptoms, and antipsychotics can be given in the face of persistent symptoms. Antidopaminergic drugs are recommended for the pharmacological treatment of the disease, especially for the elimination of tics. The use of atypical antipsychotic drugs is more common in the treatment of tic [13].

Conclusions

It is important to note that streptococcal infections can have an essential effect in many neuropsychiatric disorders, especially in childhood. Psychotherapeutic care should be provided with an empathetic perspective to children and families who are faced with illness and frustration, fear, and anxiety caused by illness, and that care should be applied within the scope of advanced nursing practice. They should be aware of the symptoms and reach out to children and families experiencing pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections [14].

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