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ORIGINAL ARTICLE

Psychiatric disorders and symptoms severity in pre-school children with cow's milk allergy



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KEYWORDS

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ECI-4;
Oppositional defiant disorder

Abstract

Background: Psychiatric disorders are seen frequently in atopic diseases. The present study aims to evaluate the frequency of psychiatric disorders and the severity of psychiatric symptoms in pre-school children with cow's milk allergy.

Methods: The parents of the pre-school children with cow's milk allergy were interviewed in person and asked to fill out the Early Childhood Inventory-4 form.

Results: The cow's milk allergy group included 40 children (27 male, 13 female) with mean age, 44.5 ± 14.7 months, and the control group included 41 children (25 male, 16 female) with mean age, 47.6 ± 15.2 months. It was established that 65% of the group with cow's milk allergy received at least one psychiatric diagnosis, while 36.6% of the control group received at least one psychiatric diagnosis, with a statistically significant difference ($p=0.02$). Within the psychiatric disorders, attention deficit hyperactivity disorders (odds ratio: 4.9, 95% CI: 1.472–16.856, $p=0.006$), oppositional defiant disorder (odds ratio: 5.6, 95% CI: 1.139–28.128, $p=0.026$), and attachment disorder (odds ratio: 4.8, 95% CI: 1.747–13.506, $p=0.004$) were found significantly higher compared with the healthy control group. When the groups were compared in terms of psychiatric symptom severity scores, calculated by using the Early Childhood Inventory-4 form, attention deficit hyperactivity disorders severity ($p=0.006$) and oppositional defiant disorder severity ($p=0.037$) were found to be higher in the cow's milk allergy group.

Conclusion: Psychiatric disorders are frequent and severe in pre-school children with cow's milk allergy.

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Introduction

Population-based studies report that the prevalence of cow's milk allergy (CMA) ranges from 1.9 to 4.9% in young children.¹ UK data from 2008 indicated that 2.3% of children aged 1–3 years suffer from CMA, the majority of these presenting with non-IgE-mediated CMA.² In general, the prognosis for CMA is good, with up to 80–90% of children developing tolerance before 3 years of age.³ However, CMA can persist up to school age and may be associated with the later development of other allergic diseases such as asthma, rhinoconjunctivitis, and atopic dermatitis,⁴ as well as other disease manifestations such as recurrent abdominal pain and psychiatric disorders.^{5,6} Hak et al.⁶ reported that Attention Deficit Hyperactivity Disorder (ADHD) is more common in children with cow's milk intolerance. Also, ADHD is common not only in children with CMA, but also in children who have atopic eczema, asthma, and allergic rhinitis.⁷ Studies have shown that other psychiatric diseases, e.g., Attachment Disorder (AD), Autistic Spectrum Disorder (ASD), Obsessive–Compulsive Disorder (OCD), and Tourette syndrome (TS), are also frequently seen in atopic diseases.^{8,9} Although studies to date have reported that psychiatric disorders are seen frequently in atopic diseases, no studies have extensively assessed the psychiatric illness symptoms in pre-school children with CMA. The purpose of this study is to ascertain the frequency and severity of psychiatric disorders in pre-school children with CMA by using the Early Childhood Inventory-4 (ECI-4) form.

Materials and methods

This multi-centre study was conducted between February 2014 and March 2015 and involved children with CMA who were admitted to the Pediatric Allergy and Asthma Clinics of Inonu University, Ondokuz Mayıs University, Adnan Menderes University, and Kanuni Sultan Süleyman Training and Research Hospital. The children's parents were interviewed and asked to fill out a data form that solicited information on the patient's demographics, sociodemographic characteristics, education status, family characteristics, parental education level, and family socioeconomic level. After completion of this form, ECI-4 was completed in about 30 min by the parents who provided care to the patients. The volunteer control group underwent the same procedure after the parent-caregivers were informed of the study and gave their consent. All scales were evaluated by a child psychiatry consultant.

Inclusion criteria

The children between the ages of three and five who were diagnosed with, or being monitored for, CMA were included in the study. The control group consisted of age- and sex-matched healthy children who applied to outpatient clinics for routine control.

Exclusion criteria

The children with incomplete or incorrectly filled-out forms, children who have allergic disease except CMA and children diagnosed with lactose intolerance were excluded from the study. In addition, the children previously diagnosed with psychiatric disorders were excluded.

Diagnosis of CMA was conducted according to the British Society for Allergy and Clinical Immunology (BSACI) guideline for the diagnosis and management of CMA.¹⁰ According to this guideline, CMA can be classified as either IgE-mediated, immediate-onset (e.g., urticaria and/or angio-oedema with vomiting and/or wheeze, soon after ingestion of cow's milk) or non-IgE-mediated, delayed-onset (e.g., allergic colitis, atopic eczema). For diagnosis of cow's milk allergy, the recruited patient who has a clear history of immediate symptoms and/or a life-threatening reaction with a positive test for cow's milk protein-specific IgE qualifies for diagnosis without a milk challenge. In all other circumstances, oral food challenge under medical supervision was carried out to confirm or exclude the diagnosis of CMA.

The Early Childhood Inventory-4, developed by Sprafkin and Gadow,^{11,12} is a scale designed to evaluate the behavioural, emotional, and cognitive symptoms of children between the ages of three and five according to DSM-IV diagnostic criteria. Disorders that rarely occur between the ages of three and five (e.g., schizophrenia) are not investigated in the ECI-4. However, diagnoses such as eating disorders, sleep disorders and AD, which occur more frequently during these ages, are included. The ECI-4 is composed of 108 items that are rated as *never*, *sometimes*, *often*, and *nearly always*. Sprafkin and Gadow graded the ECI-4 in two different ways: symptom score points and symptom severity points. In the number-of-symptoms scoring, *never* and *sometimes* are scored as 0 and *often* and *almost always* as 1. Scores obtained for each disorder in the ECI-4 are added. If this overall score is equal to or higher than the number of symptoms required for DSM-IV diagnosis, the symptom criteria score for that disorder is evaluated as *yes*. In scoring the severity of symptoms, *never* is scored as 0, *sometimes* as 1, *often* as 2, and *almost always* as 3. Scores obtained from questions are added, and the severity score of the involved disorder is found.^{11,12} The score's reliability/validity study in Turkey was carried out in general and clinical sample by Başgöl et al.¹³ in children between the ages of three and five. There are two different forms of the scale, one of which is completed by the parents and the other by teacher. In this study, the parent form was used.

Statistical analysis

To detect a difference of 26.5%, power analysis at 80% power and the 0.05 level of significance showed that the present study required a sample size of 40 patients. We recruited 40 patients for the CMA group and 41 patients for the control group.

We performed statistical analysis using Statistical Package for Social Sciences (SPSS) 16.0 software (SPSS Inc., Chicago, IL, USA). Descriptive statistics were expressed as frequency and percentage for categorical variables,

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