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PSYCHO-EMOTIONAL STRESS IN MOTHER OF CHILDREN WITH ATOPIC DERMATITIS

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Summary

Introduction. Atopic dermatitis is a chronic relapsing inflammatory skin disease characterized by the appearance of eczematous and lichenoid rashes, as well as severe itching. This disease can cause psychological problems, both in the child himself and in his parents. Difficulties in caring for a child with atopic dermatitis can lead to emotional exhaustion in the mother, provoking symptoms of depression and anxiety.

The purpose of our study was to investigate the relationship of anxiety and depression of mothers with clinical and anamnestic data of children with atopic dermatitis.

Materials and methods. The cross-sectional study included 120 mothers of children with atopic dermatitis aged 2 months to 14 years inclusive. All children were assessed the severity of the course of the disease, the prevalence of the process, its form. To assess the psycho-emotional status of mothers, the GAD-7 questionnaires were used to determine the level of anxiety of a woman and PHQ-9 to determine the level of depression.

Results. According to the results of our study, it was found that among children suffering from atopic dermatitis with higher prevalence in girls. Clinical manifestations of the disease, as a rule, begin at the age of two months to two years, and the predominant form is the erythematous-squamous form with limited localization of the disease and a mild course. Among the psycho-emotional disorders in mothers of children with atopic dermatitis, anxiety was most often observed. The presence of anxiety in the mother increases the likelihood of a moderate course of the disease in children by almost 1.5 times. At the same time, depression in the mother was not associated with any clinical and anamnestic factor of the disease.

Conclusions. Timely diagnosis of anxiety and the implementation of measures aimed at reducing it in mothers of children suffering from atopic dermatitis can help reduce the likelihood of disease progression.

Keywords: atopic dermatitis, anxiety, GAD-7, PHQ-9.

Резюме

ПСИХОЭМОЦИОНАЛЬНЫЙ СТРЕСС У МАТЕРЕЙ ДЕТЕЙ С АТОПИЧЕСКИМ ДЕРМАТИТОМ

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Введение. Атопический дерматит является хроническим рецидивирующим воспалительным заболеванием кожи, характеризующимся появлением экзематозных и лихеноидных высыпаний, а также сильным зудом. Данное заболевание может вызвать психологические проблемы, как у самого ребенка, так и у его родителей. Трудности в уходе за ребенком с атопическим дерматитом могут привести к психоэмоциональному истощению матери, провоцируя симптомы депрессии и тревожности.

Целью данного исследования являлось изучение связи клинико-анамнестических данных детей с атопическим дерматитом с проявлениями тревожности и депрессии у их матерей.

Материалы и методы. В поперечном исследовании приняли участие 120 матерей детей с атопическим дерматитом в возрасте от 2 месяцев до 14 лет включительно. У всех детей производилась оценка тяжести течения заболевания, распространенность процесса, его форма. Для оценки психоэмоционального статуса матерей использовались опросники GAD-7 для определения уровня тревожности женщины и PHQ-9 для определения уровня депрессии.

Результаты. По результатам нашего исследования было обнаружено, что среди детей, страдающих атопическим дерматитом, доминируют девочки. Клинические проявления заболевания, как правило, начинаются в возрасте от двух месяцев до двух лет, а преобладающей формой является эритематозно-сквамозная форма с ограниченной локализацией заболевания и легким течением. Из психоэмоциональных нарушений у матерей детей с атопическим дерматитом наиболее часто наблюдалась тревожность. Среднетяжелое течение атопического дерматита ассоциировалось с 1,5 - кратным повышением вероятности развития тревожности у их матерей. В то же время депрессия у матери не была связана с каким-либо клинико-анамнестическим фактором заболевания у ее ребенка.

Выводы. Своевременная диагностика тревожности и осуществление мероприятий, нацеленных на ее снижение у матерей детей, страдающих атопическим дерматитом, могут способствовать снижению вероятности прогрессирования заболевания.

Ключевые слова: атопический дерматит, тревожность, GAD-7, PHQ-9.

Түйіндеме

АТОПИЯЛЫҚ ДЕРМАТИТІ БАР БАЛАЛАРЫНЫҢ АНАЛАРЫНДАҒЫ ПСИХО-ЭМОЦИОНАЛДЫҚ СТРЕСС

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Кіріспе. Атопиялық дерматит - экзематозды және лихеноидты бөртпелердің пайда болуымен, сондай-ақ қатты қышумен сипатталатын созылмалы қайталанатын қабыну тері ауруы. Бұл ауру баланың өзінде де, ата-анасында да психологиялық проблемаларды тудыруы мүмкін. Атопиялық дерматитпен ауыратын балаға күтім жасаудағы қиындықтар ананың эмоционалды сарқылуына әкелуі мүмкін, депрессия мен алаңдаушылық белгілерін тудырады.

Бұл зерттеудің **мақсаты** аналардағы мазасыздық пен депрессияның атопиялық дерматиті бар балалардың клиникалық және анамнестикалық деректерімен байланысын зерттеу болды.

Материалдар мен тәсілдер. Көлденең зерттеуге 2 айдан 14 жасқа дейінгі атопиялық дерматитпен ауыратын балалардың 120 анасы қатысты. Барлық балалар аурудың ағымының ауырлығын, процестің таралуын, оның формасын бағалады. Аналардың психоэмоционалды жағдайын бағалау үшін әйелдің мазасыздану деңгейін анықтау үшін GAD-7 сауалнамасы және депрессия деңгейін анықтау үшін PHQ-9 пайдаланылды.

Нәтижелер. Зерттеу нәтижелері бойынша атопиялық дерматитпен ауыратын балалар арасында қыздардың басым екені анықталды. Аурудың клиникалық көріністері, әдетте, екі айдан екі жасқа дейінгі жаста басталады, ал аурудың локализациясы шектелген және жеңіл ағымы бар эритематозды-сквамозды түрі басым болады. Атопиялық дерматитпен ауыратын балалардың аналарында психоэмоционалды бұзылулардың ішінде мазасыздық жиі байқалды. Анадағы

мазасыздықтың болуы балалардағы аурудың орташа ағымының ықтималдығын 1,5 есеге арттырады. Сонымен қатар, ананың депрессиясы аурудың клиникалық және анамнездік факторымен байланысты емес.

Қорытындылар. Атопиялық дерматитпен ауыратын балалардың аналарында мазасыздықты уақтылы диагностикалау және оны азайтуға бағытталған шараларды жүзеге асыру аурудың асқыну ықтималдығын азайтуға көмектеседі.

Түйінді сөздер: атопиялық дерматит, мазасыздық, GAD-7, PHQ-9.

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Introduction

Atopic dermatitis is a complex and multifaceted inflammatory skin disorder that is typified by pruritus, a chronic and recurrent course, and age-dependent variations in the localization and morphological characteristics of lesions. Typically manifesting in early childhood, the condition persists and recurs throughout adulthood, leading to a significant decline in the patient's quality of life, as well as that of their family members. [3]. Epidemiological investigations have indicated that a percentage ranging from 3 to 5 of the global populace experiences atopic dermatitis. Notably, the prevalence of this disease in economically advanced nations is considerably higher, fluctuating between 4 to 37% [2]. Data reveals that within the children's population of the United States of America, the prevalence of atopic dermatitis is 17.2%. In Europe, this figure is somewhat lower at 15.6%, whereas in Japan, almost a quarter (24%) of children experience atopic dermatitis. As for the prevalence of the condition in different regions of the Russian Federation (RF), the results of a standardized epidemiological inquiry under the umbrella of the ISAAC program (International Study of Asthma and Allergy in Childhood) revealed that it ranges from 6.2% to 15.5%. Moreover, the incidence rates exhibited a trend of nearly quintupling within the subsequent 5 years [3]. Regarding the incidence of atopic dermatitis in our nation, the Kazakh National Center for Dermatology and Infectious Diseases reports a consistent growth in its prevalence between 2016 and 2020. The number of registered cases of atopic dermatitis throughout the country rose from 4824 in 2016 to 4632 in 2017, followed by 5272 in 2018, 7855 in 2019, and 7842 in 2020. Moreover, in terms of the incidence of atopic dermatitis in 2020, the East Kazakhstan region secured the third position with a rate of 95.8 [4].

It is widely acknowledged that immunological and genetic mechanisms play a significant role in the pathogenesis of atopic dermatitis. Immune-mediated inflammation of the skin triggered by Th2-cell activation leads to an increased susceptibility to internal and external stimuli. Furthermore, it is commonly believed that a genetically predetermined breakdown in the skin barrier

arises from a defect in the synthesis of structure-forming proteins and alterations in the lipid composition of the skin. Research has demonstrated that in children with both parents experiencing allergies, the disease manifests in 82% of cases within the first year of life. Conversely, if one parent suffers from atopic dermatitis and the other has an allergic condition of the respiratory tract, atopic dermatitis occurs in 59% and 56% of cases, respectively. In addition, the release of neuropeptides and pro-inflammatory cytokines from keratinocytes due to skin irritation is considered a significant contributor to the development of inflammation in atopic dermatitis [3].

Moreover, the involvement of psycho-emotional factors in the pathogenesis of atopic dermatitis, both in its development and severity, cannot be disregarded. The chronic relapsing nature of atopic dermatitis can result in psychological distress not only for the affected child but also for their parents [7]. The challenges involved in caring for a child with atopic dermatitis can frequently result in mothers experiencing psycho-emotional exhaustion, which can, in turn, lead to negative affective states such as depression, guilt, and anxiety. These emotional states can significantly impact the severity of the disease in the child [25,14,1].

Research conducted by *Manzoni A.P. et al* demonstrated that depressive disorders and increased anxiety are more prevalent in mothers of children with atopic dermatitis compared to mothers of healthy children [14,17]. *Im Y. et al* also identified anxiety in mothers of children with atopic dermatitis in their studies [9].

Charfi F. et al reported that mothers of children with atopic dermatitis exhibit elevated anxiety but not depression [7]. Meanwhile, *Ring J. et al* investigation into certain aspects of the parent-child relationship with atopic dermatitis found that mothers of children with atopy display less emotion and are more likely to attempt to control the child's behavior while maintaining a distance during instruction. The authors suggest that these outcomes may be attributed to the presence of anxiety in the mother [18].

Furthermore, some studies suggest that high levels of controlling behavior and indifference exhibited by mothers may increase the likelihood of developing atopic dermatitis

in infants [12]. Additionally, postpartum depression in mothers may also increase the risk of developing the disease in children, as reported by Wang I.J [24].

Therefore, the current literature regarding the association between psychoemotional disorders in mothers and the development and progression of atopic dermatitis in their children is limited, and the findings from existing studies are inconclusive.

The purpose of this article was to study the relationship of clinical and anamnestic data of children with atopic dermatitis with manifestations of anxiety and depression in their mothers.

Materials and methods

The study was designed as a cross-sectional study, and a total of 120 mothers of children with atopic dermatitis were included in the sample. Participants were recruited from the dermatovenerological hospital of the city of Semey. The diagnosis of atopic dermatitis was made by dermatologists using the International Classification of the Disease (ICD-10) criteria. Women with children diagnosed with atopic dermatitis between 2 months to 14 years of age were eligible to participate in the study.

First, the clinical and anamnestic data of children with atopic dermatitis and the psycho-emotional status of the mother were studied. Next, the relationship of clinical and anamnestic data with the psycho-emotional status of the mother was assessed.

Inclusion criteria: patients with an established diagnosis of atopic dermatitis, children aged from two months to 14 years, living in Semey.

Exclusion criteria: pregnant women, patients with adrenal, pituitary and psychiatric diseases, patients who have a history of using systemic steroids, oral contraceptives and psychiatric drugs within 3 months before the study; genetic diseases.

Data collection

The present study examined the anamnestic indicators, including the allergic anamnesis and the onset of disease manifestation. Specifically, the study investigated maternal allergic diseases such as allergic rhinitis, bronchial asthma, neurodermatitis, eczema, urticaria, and allergic contact dermatitis to determine their potential influence on the development of allergies in children. The patients were stratified into three groups based on the age of onset: 1) from two months to two years; 2) from two years to 7 years; and 3) those aged 7-14 years. Due to the small number of patients in the third group, it was combined with the second group for further analysis. Additionally, the gender of the child was considered as another anamnestic indicator.

The study evaluated the severity of atopic dermatitis by assessing the intensity of itching, the frequency of disease exacerbations per year, and the extent of the disease process. A mild course of the disease was defined as localized process with slight itching and a frequency of exacerbations of 1-2 times per year. A moderate course of the disease was characterized by widespread localization, severe itching, and a frequency of exacerbations of 3-4 times per year. Severe course was determined by diffuse localization of the process, intense itching, and a frequency of exacerbations of 5 or more times per year. Moreover, the prevalence of the process based on localization was evaluated as limited (lesion area not exceeding 10%),

widespread (10-50% of skin involvement), and diffuse (more than 50% of skin affected). Furthermore, the clinical and morphological forms of the disease were identified as exudative, erythematous-squamous, erythematous-squamous with lichenification, lichenoid, and pruriginous, serving as additional clinical characteristics of the disease.

The present study employed the GAD-7 questionnaire to assess the level of anxiety and the PHQ-9 questionnaire to assess the level of depression in mothers, in order to evaluate their psycho-emotional status. Scores ranging from 0 to 4 were interpreted as the absence of psycho-emotional disorders, scores ranging from 5 to 9 were indicative of mild disorders, scores ranging from 10 to 14 were indicative of moderate disorders, scores ranging from 15 to 19 were indicative of moderate severity, and scores ranging from 20 to 27 were indicative of severe psycho-emotional disorders. As only mild to moderate levels of depression and anxiety were identified in the women participating in the study, they were grouped together for the purpose of analysis. As a result, the participants were dichotomized based on two criteria: the presence of depression or anxiety, and the absence of depression or anxiety.

Statistical data processing

To analyze the qualitative data, frequencies and percentages were utilized. The relationship between maternal anxiety and depression and the clinical and anamnestic data of the child with atopic dermatitis was determined using Pearson's χ^2 . The level of statistical significance was considered significant at $p < 0.05$.

Statistical analysis of the results was performed using the IBM SPSS Statistics 20 program. The study protocol was developed and approved at a meeting of the Ethics Committee of NJSC Semey Medical University (protocol No. 2 dated September 13, 2022). Prior to participating in the study, all participants were informed about the objectives and methods of the research, and provided written consent to participate.

Research results

In our study, the average age of women was found to be 28.8 ± 7.1 years. The mean age of mothers with anxiety did not significantly differ from the mean age of mothers without anxiety (28.6 ± 7.4 and 28.9 ± 6.9 , respectively). Furthermore, we observed that the mean age of women without depression was younger than that of mothers of children with depression (28.4 ± 7.1 and 34.3 ± 4.5 , respectively).

Regarding the anamnestic data of children with atopic dermatitis, our study revealed a prevalence of girls over boys. The onset of the disease occurred primarily within a period of two months to two years, with a somewhat less frequent onset at the age of two to seven years. Manifestation of the disease was observed even more rarely at the age of 7 to 14 years. Additionally, we found that more than half of the children with atopic dermatitis had a maternal history of allergic diseases.

In our study, the erythematous-squamous form of atopic dermatitis was found to be the predominant clinical and morphological presentation among patients. The exudative form of the disease was observed in less than half of the cases. The frequency of the erythematous-squamous form with lichenification was found to be very rare.

Although the frequency of limited and widespread forms of the disease was almost equal, there was a slight

predominance of the limited process in patients. The diffuse form of the disease was not identified in our sample.

Furthermore, our investigation into the severity of atopic dermatitis revealed that the mild course of the disease was more prevalent among patients compared to moderate severity. Our investigation into the incidence of anxiety among mothers of children with atopic dermatitis revealed that almost half of the study participants experienced mild to moderate anxiety, as determined by the survey results. Additionally, in our study, only 5.8% of cases demonstrated mild or moderate depression among the mothers.

Table 1 presents detailed data on the clinical and anamnestic characteristics identified in this study.

Our research aimed to investigate the relationship between anxiety in mothers and the clinical and anamnestic data of their children with atopic dermatitis. Our findings indicate that mild and moderate anxiety were equally prevalent among mothers of both boys and girls (39.3% and 42.2%, respectively). Furthermore, we observed no statistically significant relationship between the period of disease onset and maternal anxiety. Similarly, the frequency of occurrence of clinical and morphological forms of the disease did not significantly differ depending on maternal anxiety. Our investigation into the relationship between the prevalence of the skin process in a child and maternal anxiety did not reveal any statistically significant associations. These results are presented in Table 2.

However, we found that the severity of the disease course was associated with maternal anxiety. As shown in Table 2, the presence of mild and moderate anxiety in a mother increases the chances of a moderate-severe course of the disease by almost 1.5 times in their child.

The prevalence of mild and moderate depression was observed to be higher in mothers of boys compared to mothers of girls (7.1% and 4.7%, respectively). Furthermore, our study showed that the incidence of mild to moderate depression was more common in mothers of children whose disease onset was older than two years of age.

Table 1.

Clinical and anamnestic data of patients with atopic dermatitis and the incidence of anxiety and depression in their mothers.

Clinical and anamnestic data	Quantity	
	abs	%
The onset of the disease		
From 2 months to 2 years	72	60%
2-7 years	45	37,5%
7-14 years	3	2,5%
Gender of the child		
Boys	56	46,7%
Girls	64	53,3%
Maternal allergies		
Yes	73	60,8%
No	47	39,2%
Clinical and morphological form of the disease		
Erythematous-squamous	63	51,7%
Exudative	50	42,5%
Erythematous-squamous with lichenification	7	5,8%
The prevalence of the skin process		
Limited	61	50,8%
Widespread	59	49,2%
Diffuse	0	0%
The severity of the disease		
Mild	68	56,7%
Moderate	52	43,3%
Severe	0	0%
The presence of anxiety in the mother		
Yes	49	40,8%
No	71	59,2%
Maternal depression		
Yes	7	5,8%
No	113	94,2%

Table 2.

Association of clinical and anamnestic parameters of atopic dermatitis in children with anxiety in their mothers.

GAD-7	No anxiety	Mild to moderate anxiety	p	OR (95%CI)
Gender				
Boys (n=56)	34 (60,7%)	22 (39,3%)	0,7	1,13(0,54-2,34)
Girls (n=64)	37 (57,8)	27 (42,2%)		
The onset of the disease				
From 2 months to 2 years (n=72)	43(59,7%)	29 (40,3%)	0,88	1,06 (0,50-2,23)
From 2 years old to 17 years old (n=48)	28 (58,3%)	20 (41,7%)		
Clinical and morphological form of the disease				
Erythematous-squamous, Erythematous-squamous with lichenification (n=70)	43 (61,4%)	27 (38,6%)	0,55	1,25 (0,60-2,62)
Exudative (n=50)	28 (56%)	22 (44%)		
The prevalence of the skin process				
Limited (n=61)	36 (59%)	25 (41%)	0,9	0,99(0,74-1,34)
Widespread (n=59)	35 (59,3%)	24 (40,7%)		
The severity of the disease				
Mild (n=68)	46 (67,6%)	22 (32,4%)	0,03	1,41(1,02-1,95)
Moderate (n=52)	25 (48,1%)	27 (51,9%)		

Note: χ^2 -Chi-squared, p-statistical significance level, OR-odds ratio, CI-confidence interval

Regarding the relationship between depression in mothers and the clinical and anamnestic data of their children with atopic dermatitis, we found no significant associations between any of the studied indicators. The incidence of clinical and morphological forms of the disease did not differ significantly depending on the mother's depression status. However, mothers with depression were more likely to have children with limited localization of the skin lesion. Moreover, the frequency of a moderate course of the disease in children was almost three times higher

among those whose mothers were diagnosed with depression compared to those whose mothers did not have depression.

Despite these findings, none of the clinical and anamnestic indicators we studied were significantly associated with depression in the mother. The detailed data on the relationship between depression in mothers and the clinical and anamnestic characteristics of their children with atopic dermatitis are presented in Table 3.

Table 3.

Association of clinical and anamnestic parameters of atopic dermatitis in children with depression in their mothers.

PHQ-9	No anxiety	Mild to moderate anxiety	p	OR(95%CI)
Gender				
Boys (n=56)	52 (92,9%)	4 (7,1%)	0,57	0,97(0,89-1,07)
Girls (n=64)	61(95,3%)	3(4,7%)		
The onset of the disease				
From 2 months to 2 years (n=72)	68 (94,4%)	4 (5,6%)	0,87	1,01 (0,92-1,11)
From 2 years old to 17 years old (n=48)	45 (93,8%)	3 (6,3%)		
Clinical and morphological form of the disease				
Erythematous-squamous, Erythematous-squamous with lichenification (n=70)	66 (94,3%)	4 (5,7%)	0,95	1,00 (0,92-1,10)
Exudative (n=50)	47 (94%)	3 (6%)		
The prevalence of the skin process				
Limited (n=61)	57 (93,4%)	4 (6,6%)	0,73	0,98 (0,90-1,08)
Widespread (n=59)	56 (94,9%)	3 (5,1%)		
The severity of the disease				
Mild (n=68)	66 (97%)	2 (3%)	0,12	1,07 (1,97-1,18)
Moderate (n=52)	47 (90,4%)	5 (9,6%)		

Note: χ^2 -Chi-squared, p-statistical significance level, OR-odds ratio, CI-confidence interval

Conclusions and discussion

In this study, it was found that among children with atopic dermatitis, girls were more predominant and the clinical onset of the disease typically occurred between the ages of two months to two years. The erythematous-squamous form of the disease was the most common, and a limited localization of the disease with a mild course was observed. Anxiety was found to be more prevalent than depression in mothers of children with atopic dermatitis. The presence of anxiety in mothers was found to increase the likelihood of a moderate to severe course of the disease in their children by almost 1.5 times. However, maternal depression was not found to be associated with any of the clinical and anamnestic factors studied.

These findings are consistent with the results of a study by *Charfi F. et al* [7], which also found an association between maternal anxiety and atopic dermatitis, but not with depression. It is possible that the effect of depression on the course of atopic dermatitis in the postnatal period may not be as significant compared to its effect in the perinatal period.

As is widely known, numerous studies have been dedicated to investigating depression and anxiety in mothers during the perinatal period. Some data suggests that the presence of depression and anxiety in pregnant mothers leads to more pronounced symptoms of the disease in their children, irrespective of the mother's level of education, presence of allergies, and other factors [23]. Moreover, certain authors propose that the child's immune

system continues to develop post-birth and maternal stress can affect it at any age [15,21,13]. For example, perinatal stress in the mother, as investigated by *Wen H.J. et al*, has been associated with the onset of atopic dermatitis at two years of age [26]. Conversely, postnatal depression and anxiety in the mother have been found to affect the development of atopic dermatitis in infancy (3-12 months), according to some authors [16]. A study on the combined effects of prenatal and postnatal depression revealed that they are risk factors for atopic dermatitis development at 6-13 years of age [5]. Unfortunately, our own study was unable to identify any effects of postnatal depression and anxiety in mothers on atopic dermatitis development at a specific age.

Kawaguchi C. et al. conducted a study on atopic dermatitis, revealing that the severity of the condition was associated with the psychological status of the mother solely in the postnatal period and not in the perinatal period. However, the combined effect of perinatal and postnatal stress indicated a close association with the development of atopic dermatitis during both periods [10]. Thus, it may be inferred that the psychological state of the mother can impact the development and progression of atopic dermatitis during any stage and can have a cumulative effect. During gestation, maternal stress induces the release of corticotropin-releasing hormone (CRH) via activation of the hypothalamic-pituitary-adrenal (HPA) axis. The CRH is transported across the placenta to the fetus and stimulates the fetal HPA axis to release glucocorticoids.

The excessive secretion of glucocorticoids leads to oxidative stress, thereby modifying the infant's immune system [27, 6].

During the postnatal period, high maternal stress can contribute to the expression of immunoglobulin E and allergen-specific proliferative responses in the child, leading to alterations in the immune system and an increased inflammatory response [29]. These changes can be attributed to disruptions in maternal-child contact and interaction due to stress, which results in elevated cortisol levels in the child [27]. Infants rely on close contact with their mothers, particularly during the first three years, to regulate stress [20, 12]. Notably, abnormal levels of specific cytokines released by T-helper 2 cells are implicated in the pathogenesis of atopic dermatitis [22, 19]. Excessive exposure to glucocorticoids, specifically cortisol, at an early age may cause altered differentiation of these cytokines [8, 29].

Our study has several limitations. Firstly, the small sample size is a significant disadvantage. The lack of association between depression and the course of atopic dermatitis observed in our study may be related to the limited sample size. Secondly, the recruitment of patients was restricted to the city of Semey, and therefore, the generalization of our findings to the entire Kazakh population may not be appropriate. Thirdly, the cross-sectional design of our study is inferior in terms of the degree of evidence provided compared to case-control and cohort studies, as it does not allow us to establish any causal relationships. Nevertheless, these limitations motivate further research in this area. Future investigations should aim to elucidate the mechanisms underlying long-term exposure to glucocorticoids, determine the level of T2-specific cytokines in the fetus or infant, and assess the quality of the mother-infant relationship under stress.

It is important to note that our study only examined maternal anxiety and depression in the postnatal period. However, the presence of anxiety in the mother may not be limited to the time of the study. Therefore, further cohort studies are required to investigate anxiety and depression in mothers during the perinatal period as well.

Despite the limitations of our study, it is the first of its kind in our region (Semey), aimed at examining the relationship between anxiety, depression in mothers of children with atopic dermatitis, and disease severity. The prognostic criterion identified in our study has practical implications. Early detection of maternal anxiety and interventions aimed at reducing it, clinical assessment of anxiety, improved social support, and the implementation of early intervention programs aimed at improving the quality of the mother-child relationship may decrease the likelihood of childhood atopic dermatitis and the progression of atopic march. Additionally, these interventions may help identify genetic and neuroendocrine factors associated with the disease.

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