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Editorial

# On the Pathogenesis of Juvenile Idiopathic Arthritis: An Editorial

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## Introduction

Juvenile arthritis is known as a genetically determined, multifactorial disease with an immunoaggressive pathogenesis, in which immune tolerance to self-antigens is impaired. Genetic predisposition (e.g. HLA-B27) combines with external triggers (infections, intestinal microbiota imbalance, hypothermia, sun exposure, trauma, stress), causing joint inflammation.

Since these factors are essentially commonplace for everyone, it is interesting to know whether there are other significant factors that increase the risk of developing juvenile idiopathic arthritis (JIA)?

In our previous studies, we used questionnaires to determine the impact of various factors on children's health. As breastfeeding continues, allergic reactions decrease. Smoking in the home increases the incidence of infectious diseases. Excessive screen time leads to an increase in complaints and neurological disorders.

## Objective of the Study

To determine whether any circumstances, other than known triggers, increase the risk of developing JIA.

## Materials and Methods

A survey was conducted among 41 mothers of children registered at the Region Children's Clinical Hospital for JIA (Study Group I, Main Group). The results obtained in the JIA group were compared with the surveys of 43 randomly selected mothers of children without joint diseases (Comparison Group II). The groups were comparable by age and gender.

The significance of differences in comparable indicators was determined using the Student's t-test and the online calculator on the Medical Statistics website (http://medstatistic.ru/calculators/calcstudent.html).

## Results and Discussion

The immune system of children with juvenile idiopathic arthritis (JIA) was more effective in fighting infections compared to the control group. Thus, this group had fewer children who were frequently ill (43.9% versus 53.5%); significantly fewer children suffered from childhood infections (58.5 ± 7.69% versus 79.1 ± 6.20%, $p < 0.05$). In particular, in the main group, 1 child had measles, while in the

comparison group there were four. In the first group, there were no cases of rubella (in the second group there were 4), 21 children (51.2 ± 7.81%) and 31 children (72.1 ± 6.84%, $p < 0.05$), respectively, had chickenpox; five children in the comparison group had three infections each, while in the main group only two children had two infections each.

These children are more resistant to bacterial infections. For example, only 6 children in the study group (14.6 ± 5.52%) and 14 in the comparison group (34.9 ± 7.27%, $p < 0.05$) suffered from pneumonia; 15 (36.6 ± 7.52%) and 26 (60.5 ± 7.46%, $p < 0.05$), respectively, suffered from tonsillitis.

Breastfeeding for more than a year was significantly more common in the study group than in the comparison group. This is one of the reasons for the significantly lower number of children with allergies among patients with JIA than in the comparison group: 15 (36.6 ± 7.12%) and 27 (62.8 ± 7.37%, $p < 0.02$).

Smoking in the home was analyzed. It turned out that in families with JIA, the percentage of non-smokers at home was significantly higher (75.6 ± 6.71% vs. 53.5 ± 7.61%, μg < 0.05). A similar situation is observed with screen time. Children with JIA spend an average of 5.5 hours in front of a screen, which is certainly significant, but for children in the comparison group, this figure is 9 hours.

Children in the main group had a fewer complaints. For example, 11 children in the second group complained of headaches, compared only one in the first (25.6 ± 6.65% vs. 2.44 ± 2.41%, μg < 0.002). Fatigue, lethargy, and absent-mindedness were complained of by 11, 6, and 5 children in the second group, while none of the first group complained of these conditions.

The opposite pattern is observed for a bad family history.

In the JIA group, 13 children had close relatives with joint diseases. In the comparison group, there were five such cases (31.7 ± 7.27% vs. 1.6 ± 4.89%, $p < 0.02$). In the main group, five children had fathers with psoriasis, which is significantly higher than in the general population.

## Conclusion

Thus, based on all the parameters tested, the group of children with JIA not only does not appear worse, but even outperforms the comparison group. Neither breastfeeding, nor infectious diseases, nor allergies, nor smoking in the home, nor overwork are significant risk factors for developing JIA.

The survey confirmed the existence of a genetic determinant in cases of JIA development.

Children with a strong family history of arthritis and psoriasis should be monitored as being at risk for JIA.

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