



Original Contribution

ATOPIC DERMATITIS IN CHILDREN WITH HIGH MEDICAL AND SOCIAL RISK PLACED IN HOME FOR MEDICAL-SOCIAL CARE

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ABSTRACT

Atopic dermatitis (AD) is one of the most common skin diseases in children with onset at first six months of life. It is caused by various environmental, climatic and orphanage conditions. This study evaluates the prevalence of atopic dermatitis in younger children (0-10 years) with high medical and social risk, placed in the Home for Medico-social Care, and also to describe the relationship between AD and different environmental factors in this closed society outside the family. We performed clinical examination and retrospective study of 104 children at birth and/or entering into the Home. Presence of AD was determined using the diagnostic criteria defined by Hanifin and Rajka retrospective study.

From the study group 7 % had AD whereas 2% entered the home with the features of the disease. All children were growing up under permanent medical care control in a special regimen needed for the psycho-emotional growth and quality of life. Dust and allergens in the Home were reduced to minimum. The low frequency of AD in children from the Government Run Home for Medico-Social Care was a result of low-risk environmental conditions, including low allergen level.

Key words: frequency of atopic dermatitis, environmental factors, institutional factors

INTRODUCTION

Atopic dermatitis (AD) is one of the most frequent chronic inflammatory skin diseases associated with cutaneous hyperactivity to environmental triggers (1, 2). AD has its onset during the first 6 months of life; it has age-specific morphology and distribution of lesions (3), typified by pruritus, eczematous lesions, xerosis and lichenification on the skin (4).

Four clinical phases are recognized: infantile phase – from 2 months to 2 years, childhood phase – from 3 years to 11 years, adolescent/young adult phase – from 12 years to 20 years, adult phase – up to 20 years (5). The clinical phenotype is a result of complex interactions between several genetic and environmental factors (6).

It is considered that genes predisposing to AD have not changed over the past 60 years but the environmental factors have changed considerably (7).

During the past three decades its prevalence has increased two to threefold in industrialized countries, but at the same time has remained much lower in rural or agricultural areas (2).

AD affects more than one in ten children (8) or 10 % - 20% of children's population and 1- 3 % of adults in industrialized countries (1).

The medical literature contains some specified risk factors provoking the disease, including the so-called western lifestyle, small family size, migration from rural to urban areas (9), climate, psychological, irritants, aeroallergens, and food (10).

There is no sufficient data in scientific literature concerning manifestation of AD among children exposed at high medical and social risk growing up under conditions typical of a limited group in

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medico-social care homes as well as any data about the influence of environmental and institutional factors upon disease origin and course among such children.

MATERIALS AND METHODS

Materials

This pilot study includes 104 children growing up under the conditions of “closed society environment” in a Medical-Social Care Home, in the city of Stara Zagora, Bulgaria (**Figure 1**), with high medical and social risk at birth and/or since entry into the home.



Figure 1: General view of the Medical-Social Care Home, Stara Zagora, Bulgaria

Our study refers to the frequency of Atopic dermatitis (AD) associated with gender, age and accompanying diseases defined as a state with high medical risk.

Children are divided into three groups depending on their age: from new-born to 3 years old; from 3 to 6 and from 6 to 10 years old.

Methods

A clinical examination was performed by a dermatologist. The diagnosis of atopic dermatitis was set according to the diagnostic criteria of Hanifin and Rajka (**Table 1**) (11).

A retrospective data collection (demographic, institutional and environmental factors) was carried out.

RESULTS

Demographic data

Out of 104 children studied on the basis of medical documentation data (the diagnosis of atopic dermatitis was made by a dermatologist-consultant) and a clinical examination, 7 (7 %) of them were found to suffer from AD (**Figure 2**). Five of them were aged 3 years and two were between 3 and 6

years old. Two of the children had entered the Home with the clinical features of AD (**Table 2**). All had been in the first infantile phase, except one child who had been in the childhood phase. Two of the boys with AD – monozygotic twin pair were born prematurely I stage and had symptoms of infantile bronchial asthma, diagnosed after determining the features of AD. Other two children – a boy and a girl had Down syndrome; one child was with infantile cerebral paralysis and multicystic encephalopathy, shown by computed axial tomography and manifested with convulsions; the other two children were not threatened by any medical risk.

Institutional environmental factors

On the basis of our examination on the influence of institutional and environmental factors in the Home for Medico-Social care, we concluded the following:

- The Home is a medical institution under the jurisdiction of the Ministry of Public Health performing its activities on the basis of legislative acts related to health protection, social activities and protection of children.
- Equal and permanent conditions for bringing up children.
- Multidisciplinary team of providing various services (paediatrics, psychology, pedagogy, nurses and consultant specialists - dermatologist, neurologist, physiotherapist, etc.).
- Permanent observation and recording of changes and adequate behaviour following specific written instructions and procedures.
- An individual programme for observation, attendance, diagnostics and therapy.
- Permanent close contact between children and staff on the basis of the “family model” for bringing up children in an institution (**Figure 3**).
- Established standards for correct storage and use of toys (out of bedrooms and playrooms).
- Established standards for cotton clothing and blankets.
- Furnishing – absence of carpets and other flooring collecting dust in bedrooms, regular aeration and disinfection of existing ones in the other premises.
- Microclimate – aeration and direct sunlight in rooms; relatively constant temperature, no severe variations.
- Isolation from aeroallergens by double-

- packed windows and outer doors.
- Established standards for hygienic regimen with proper dust cleaning; disinfection with certified products and

methods for disinfection in children's institutions containing no chlorine and formaldehyde.

Table 1: Diagnostic criteria of atopic dermatitis according to Hanifin and Raika

Major criteria: 3 are required
1. Pruritus
2. Appearance and typical topography Lichenification of the joint folds in children Involvement of the face and of the extensor aspects of the limbs in infants
3. Chronic and reccuring progression
4. Family or personal history of atopy
Minor criteria: 3 are required
1. Xerosis
2. Ichthyosis, pilar keratosis
3. Immediate, positive skin reactions
4. Elevated total serum Ig E
5. Early age of appearance
6. Tendency to skin infections
7. Dermatitis of hands and feet
8. Eczema of the nipple
9. Cheilitis
10. Recurring conjunctivitis
11. Dennie-Morgan sign
12. Keratoconus
13. Anterior subcapsular cataracts
14. Peri-ocular pigmentation
15. Facial palor and erythema
16. Pityriasis alba
17. Anterior folds of the neck
18. Pruritus on sweating
19. Intolerance to wool and to fatty solvents
20. Perifollicular reinforcement, especially on black skin
21. Food intolerance

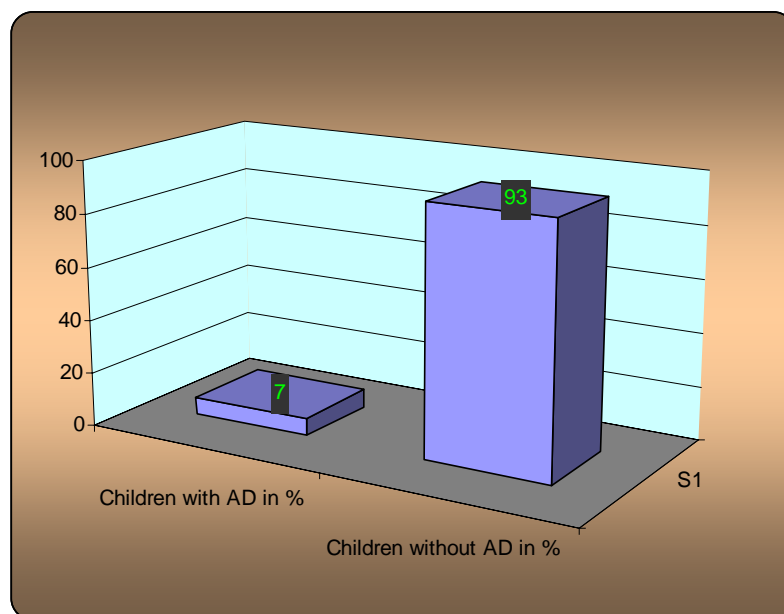


Figure 2: Distribution in per cents of the children, according to the presence or absence of atopic dermatitis

Table 2: Distribution of children with and without data for atopic dermatitis (AD), according to gender, age and place of origin of AD

Age	Children with AD	In Home outbreak of AD	Admitted with AD		Admitted with AD	Total number of children		Total number of children	Total number of children	
			Boys	Girls		Boys	Girls		Boys	Girls
0 - 3 yo.	5	3	2	1	2	1	1	68	43	25
3 – 6 yo.	2	2	1	1	-	-	-	28	10	18
6 – 10 yo.	-	-	-	-	-	-	-	8	3	5
Total:	7	5	3	2	2	1	1	104	56	48



Figure 3. Close contact between children and staff on the basis of the “family model”

Climate factors

- Location of the Home – suburban area of town, far away from heavy traffic, near a forest park.
- Sun shining and winds – the Home is situated on a southern slope, protected from winds and drafts.
- Altitude - 276 meters.

DISCUSSION

The phenotype expression of AD is a result of interaction between genetic mutations and the cutaneous hyperactivity to environmental stimuli (12). The latter play an important role for the development and manifestation of allergic conditions in genetically predisposed subjects (13).

We investigated the influence of some environmental factors on the AD frequency in children growing up in a closed institutional group under similar and permanent conditions. For a model we chose a Medico-Social Care Home under the jurisdiction of the Ministry of Public Health of Bulgaria.

In this pilot study only 7 children of the studied 104 (from newborns to 10 years old) manifested any features of AD. Five of them are at the age of newborns to 3 years old, in the infantile phase and two from 3 to 6 years old, in the childhood phase. According to the indicator age our results are in comparison

with these in medical literature (5).

For two boys – monozygotic twin pair, born prematurely (Stage I), we specified that AD manifested during the first year of life; one year later has manifested symptoms of infantile bronchial asthma. Investigations show high frequency of AD in monozygotic twins, probably due to the influence of some genetic factors in the development of AD (14) and also high prevalence of asthma in prematurely born children (15).

Two of the children suffering from AD have also Down syndrome (**Figure 4**). Literature data show an association between this syndrome and increased xerosis (16), as well as frequent skin manifestations such as AD (17).



Figure 4. One of the children with Syndroma Down, suffered from atopic dermatitis (the first child from the left)

In this pilot study we found that the settled frequency of AD among children - (7 %) is low in comparison with data from medical literature - about 20 % (18). There are not enough epidemiologic studies of children, placed and brought up in a closed society group.

We think that the reason for this is the influence of some specific institutional and environmental factors ensuring a good level of prevention in the studied Home:

Daily premises hygiene with proper flooring reduces the presence of micro-organisms and

dust, which are some of the most essential factors provoking AD.

Moderate quantity of plush toys – probable dust collector (19); recommended control on placing toys at their disposal, decreases the risk of continuous contact with dust.

Double packing of the outer windows and doors ensure minimum accumulation of harmful emissions and dust (19).

Although some authors do not consider relationship between AD frequency and the atmosphere in premises without pictures, unnecessary furniture, building materials, pesticides (18), we believe that the interior in the studied Home plays an important role in AD prevention.

It is well known that air polluted by harmful flue gases, especially NO₂, (20) and the location near heavy traffic, is a risk factor for aggravating AD (21). Probably the optimum conditions in the Home (location, lack of dust) – contribute to the low frequency of AD.

In our opinion the initiated practices for hygiene regimen with proper dust cleaning and disinfection by certified products containing no chlorine and formaldehyde (20), reduce the risk of AD. Thus we confirm data from medical literature that the aeroallergens and detergents are one of the most important exogenous factors aggravating AD (22).

We confirm the role of growing up in big groups as it stands in the Home for Medico-Social Care for the low frequency of AD in comparison with children growing up in small ones (11).

A vast number of findings suggests that increased levels of daily stress or exposure to acute stressors can be associated with exacerbation of AD (23). According to our studies, the permanent closed relation between staff and children on the basis of the “family model” for bringing up children in an institution and the work with psychologist, provide a quality of life under low psychological stress.

The permanent medical observation and child care by a well-trained team ensure appropriate conditions for prevention of AD.

CONCLUSIONS

Our findings show that the detected low frequency of AD manifestations in children growing up in a home for medico-social care might be a result of low exposure to allergens and created proper conditions of life. Thus we confirm the meaning of the environmental and closed society factors for the beginning and

running of the disease and also its low prevalence among children living in a bigger group than in small families. In this pilot study, the Medico-Social Care-Home was chosen like a model. This is preliminary data and its summarizing requires additional research and comparative analysis with other similar Homes.

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