

ORIGINAL PAPER

Homeopathic therapy in pediatric atopic diseases: short- and long-term results



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Aim: To study the outcomes of atopic diseases in children treated with homeopathy at the Homeopathic Clinic of Lucca (Italy) and related long-term results after approximately an 8-year period.

Materials and methods: Our data derive from an observational longitudinal study carried out on 857 pediatric patients who consecutively visited from 1998 to 2014. Children with atopic diseases were 325 (37.9%), 126 (39%) suffered from atopic dermatitis, 72 (22%) from allergic rhinitis, and 127 (39%) from asthma. Moreover, a long-term study was conducted on a subset of 107/165 patients, consecutively visited from 1998 to 2006, and with ≥ 5 years follow-up. The study also investigated the evolution of overall symptoms in those patients with a complex atopic symptomatology.

Results: 75.8% of atopic children had moderate or major improvement (67.1% with asthma as the primary disease; 84.2% rhinitis; 84.2% dermatitis). At re-evaluation after 5–10 years, complete remission of atopic symptoms was obtained in 70.1% of the children: 84.2% in dermatitis; 48.1% in allergic rhinitis; 71.4% in asthma. Children with two or three atopic diseases at the first visit were completely cured in 40% of cases.

Conclusion: The results seem to confirm that homeopathic medicine produces positive therapeutic response in atopic children. *Homeopathy* (2016) 105, 217–224.

Keywords: Atopic diseases; Homeopathy; Dermatitis; Allergic rhinitis; Asthma; Short and long term results

Introduction

Childhood atopic diseases consist of the triad of atopic dermatitis, allergic rhinitis, and asthma. All share a common pathogenesis, being mediated by IgE, and are frequently present together in the same individual and family. Atopic diseases are the most common chronic childhood conditions and, in recent decades, asthma and allergy have reached epidemic proportions in most Western societies.

It has been calculated that over 500 million people suffer from allergic rhinitis¹; according to World Health Organization (WHO) statistics, hundreds of millions of subjects in the world suffer from rhinitis,² but the prevalence of

allergic rhinitis varies from one country to another (5–40%). One out of 5 children and adults has been shown to suffer from this condition.^{3,4}

Asthma is a chronic inflammatory disease of the airways. More than 300 million children worldwide have asthma and the numbers are increasing in many countries.⁵ Episodic wheeze occurs in about 30% of all children, while persistent asthma occurs in about 10% of all children and 5% of adults, even though this varies greatly across geographic regions.⁴ In the United States, asthma affects more than 22 million people. It is one of the most common chronic childhood diseases, affecting more than 10 million U.S. children ages 17 and younger (14%).⁶ Atopy is present in about 75% of all children with asthma but only in 50%, or even less, of adults.⁷

Atopic dermatitis is a serious and widespread health problem, with a prevalence in children that varies, according to different authors, between 10 and 20%⁸ or 18 and 25%⁹ and it has been calculated that about 20% of all children develop symptoms of atopic dermatitis at some point in their lives.¹⁰ The 2010 and 2012 National Health

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Interview Surveys, two U.S. population-based studies, surveyed 27,157 and 34,613 adults (range 18–85 years), showing that adult eczema is responsible for a large health-care burden for adults, with substantial out-of-pocket costs, indirect costs from missed work days and sick days, and increased healthcare utilization.¹¹

Complementary and alternative medicines (CAM) are used extensively in the treatment of atopic dermatitis, allergic rhinitis, and asthma. Some studies have shown that about half of all patients with atopic conditions try out alternative medicine treatments,^{12,13} including homeopathy. This trend is likely to persist as data continue to emerge on the effectiveness of homeopathy for these conditions.

In a review of seventeen studies examining the use of CAM by people with asthma, the reported level of use ranged from 4% to 79% for adults, and from 33% to 89% for children. The most commonly used CAMs were breathing techniques, herbal products, homeopathy, and acupuncture.¹⁴

Among the different CAMs, homeopathy is perhaps the most common, and certainly among children, but evidence-based recommendations are lacking.¹⁵

In a survey conducted in Tuscany in 2009, a quarter of the pediatric patients (under age 14) had used complementary medicine, with homeopathy representing more than 90% of cases,¹⁶ and with atopic diseases among the most frequently seen by the homeopathic doctors. In 2012, we published a study on the evolution of atopic diseases in children treated with homeopathy at the Homeopathic Clinic of Lucca (Italy) and the long-term results in children suffering from atopic dermatitis after approximately an 8-year period (range 5–10 years).¹⁷ With the present study, we have extended the research to all atopic diseases: atopic dermatitis, allergic rhinitis, and asthma.

Aim of the study

This is a longitudinal study of outcomes for pediatric patients with atopic diseases (atopic dermatitis, allergic rhinitis, and asthma) who were visited consecutively at the Homeopathic Clinic of the Campo di Marte Provincial Hospital of Lucca (Italy) from 1998 to 2014. Long-term follow-up evaluations were made for atopic cases consecutively visited from 1998 to 2006, at a distance of at least 5 years from the first homeopathic visit. The patients who had not returned were contacted for a clinical evaluation follow-up.

Materials and methods

Design

This is a retrospective observational study of a database of 857 out of 3446 consecutive patients who attended the Homeopathic Clinic of the Campo di Marte Hospital in Lucca, Tuscany (Italy), from September 1998 to December 2014, and the long-term clinical evaluation of 107 out of 165 pediatric patients suffering from atopic diseases visited

from 1998 to 2006, re-evaluated after a period of at least 5 years (Figure 1).

Setting

The homeopathic doctors working at the clinic are professional specialists who attended a homeopathy school for at least three years, have gained at least 25 years of experience in the field, and are registered with the Medical Council as experts in homeopathy, according to Tuscan law n. 9/2007¹⁸ and the related Agreement Protocol of 2008.¹⁹

The duration of homeopathic visits at the clinic is about half an hour. The patients who wish to be treated with homeopathy can book an appointment whether they are self-referred or sent by their general practitioner or other specialist. Average wait times are between three and five months due to high demand. There are no specific eligibility criteria.

Informed consent

All the patients included in this study were asked to sign a privacy disclaimer and an informed consent form for therapy and the use of their data for future analysis. An individual identification number was assigned to all patients so that the data could be anonymized, collected, and stored in a database.

Treatment

The clinic's homeopathic treatment protocol consists in administering a single remedy. Initially, such remedies are taken in Quinquagintamillesimal dilutions, Q potencies,²⁰ starting with 6Q and continuing on a progressive scale of dilutions, from 6 to 9, 12, 18, 24, 30, and, sometimes, 60Q, generally for a period of 45–60 days for each potency. If there is a subsequent treatment phase, the prescription then proceeds with a single dose of a high dilution according to Hahnemann's centesimal scale (C), in a 'scale of potencies' (200–M–XM). Acute cases are usually treated by means of remedies in centesimal dilutions at low potencies (from 6C to 30C). On the patient's first visit, or more commonly at their first control visit (generally 2 months later), the homeopathic doctors decide whether and when it is possible for patients with chronic or recurrent diseases, previously treated with conventional drugs, to reduce and gradually discontinue such treatments. The entire tapering process is carried out in strict cooperation with the homeopathic physician and the patients can recommence their conventional medicine at any time, especially if there is no improvement.

Outcome parameters

In order to assess the response to homeopathic treatment, patients who had at least one follow-up were reviewed. The first follow-up measurement was taken after at least 2 months and subsequently after 6, 12, 18 months, and so on. For this study, we used the most recent response for the outcome results and the most recent response after 5 years or more for the long-term results. Some data do not derive from follow-up visits but from a telephone interview

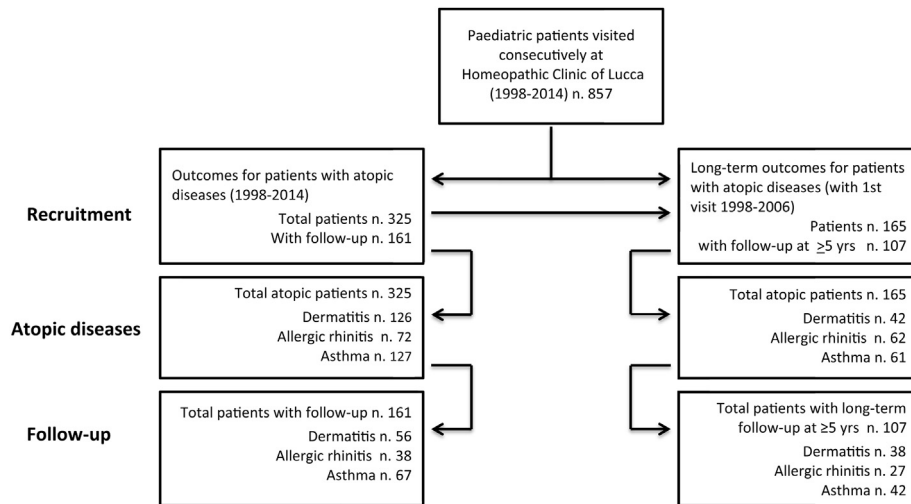


Figure 1 Recruitment, follow-up, and long-term follow-up analysis of paediatric patients with atopic diseases (atopic dermatitis, allergic rhinitis, asthma) in homeopathic treatment.

with the children's parents no later than 5 years after the first visit.

The patients' demographic data, along with clinical diagnoses according to ICD 10 coding (International Statistical Classification of Diseases, Injuries, and Causes of Death); the prescribed remedy, potency and dosage; the prescription strategy; and a determination of the case as acute, chronic or recurrent were collected on paper and entered into a database using Win-CHIP (Computerized Homeopathic Investigation Program).²¹

The outcomes were evaluated according to the Glasgow Homeopathic Hospital Outcome Scale (GHHOS)²² and will hereafter be referenced as ORIDL (Outcome Related to Impact on Daily Living).²³ The reference values of the GHHOS, which are based on a Likert scale, define the different degrees of improvement: 0 = no change/unsure; +1 = slight improvement, no effect on daily living; +2 = moderate improvement, affecting daily living; +3 = major improvement; +4 = cured/back to normal; -1 = slight deterioration, no effect on daily living; -2 = moderate deterioration, affecting daily living; -3 = major deterioration; -4 = disastrous deterioration. As none of the patients' responses achieved a degree lower than -1, our tables do not include the values of -2, -3, and -4.

Patients' conditions in the long-term study were evaluated on a 5-level ordinal scale (from 0 to 4) both during the first visit and the follow-up. Homeopathic effectiveness was evaluated using the Wilcoxon test for paired samples.

For the diagnosis of atopic dermatitis, we used the reference criteria proposed by Williams and colleagues (1994).²⁴ Moreover, we used the following criteria to establish the physical severity of atopic eczema: *Clear*: Normal skin, with no signs of active atopic eczema. *Mild*: Patches of dry skin, sporadic itching (with presence or absence of small red areas). *Moderate*: Dry skin areas, recurrent itching, redness (presence or absence of excoriation and localized thickening and tightness of the skin). *Severe*: Large areas of dry skin, constant itching, redness (with or without excoriation, widespread skin thickening, bleeding, oozing,

cracking, and pigment alteration).²⁵ For asthma and allergic rhinitis, level 0 means absence/remission of symptoms; level 1 mild/intermittent (episodic) symptoms; level 2 mild/persistent symptoms; level 3 moderate/persistent symptoms; level 4 severe/persistent symptoms.²⁶

Long-term evaluation

In order to properly evaluate and understand the long-term results collected for 165 consecutive patients suffering from atopic diseases examined and treated with homeopathy from 1998 to 2006, we attempted to contact their parents after an average of eight years (5–10 year range) from the first visit.

We included both patients who had followed up (i.e., with at least one check-up visit after 2 months from the first visit) and those who had not. It should be noted, however, that some of the children had continued to take homeopathic remedies over the years, not in association with our public clinic but through private practices. Out of the 165 patients, we were able to locate the parents in 107 cases.

Parents were asked to bring their children back to the clinic for follow-up assessment. The data for long-term evaluation were collected by means of a parent questionnaire with a predetermined set of responses. The questionnaire, which contained a series of questions about their children's health, was administered either during one of the visits or via a phone interview.

The information obtained through the questionnaire was designed to assess the evolution of the main symptom and the overall picture at re-evaluation, including the development of diseases that were absent at the time of the first visit. Two questions were related to the presence and severity of the atopic diseases and possible performance of the RAST or Prick test.

Statistical analysis

Data entry, screening, encoding, and data analysis were performed by well-trained staff at the homeopathic clinic. Statistical analyses were performed using the statistical software package PASW (release 18.1 of SPSS, Statistical

Package for Social Sciences). Outcome evaluation of the main symptoms was conducted via Wilcoxon's test applied to matched-pair samples, associated with a two-tailed significance test.

Results

From September 1998 to December 2014, 3446 patients were examined at the Homeopathic Clinic of Campo di Marte Provincial Hospital AUSL 2 of Lucca. A total of 857 (24.9%) were pediatric patients and 325 (9.4%) of these had atopic diseases. Among the latter, 177 (55.5%) were 0–6 years old and 148 (45.5%) were 7–14 years old; 195 (60%) were males and 130 (40%) were females. Additionally, 79.1% of these patients had already used conventional medicine for the same diseases for which they sought a homeopathic consultation (this variable identified patients who probably did not obtain a regression of the symptoms using allopathic medicine or had reported adverse effects and therefore decided to request a new therapy). Some of the patients (19.7%) had already used homeopathic treatment for the existing disease at the time of the first visit.

In order to assess the results of the homeopathic treatment, a total of 161 (49.5%) patients returning for at least one check-up visit after the initial consultation were examined. Follow-up was higher in children with rhinitis and asthma (52.8%) than in children with dermatitis (44.4%).

Among the 325 pediatric patients with atopic diseases, 126 (38.8%) were children with atopic dermatitis, 127 (39.1%) with allergic rhinitis, and 72 (22.2%) with asthma. Dermatitis was prevalent in children 0–6 years of age (49.7%), who had a very low prevalence of allergic rhinitis (9.6%), and lower in children 7–14 years of age (25.7%), who showed a prevalence of rhinitis (37.2%) and asthma (37.2%) (Table 1).

In order to carry out the long-term evaluation, we retrospectively examined 1730 consecutive patients seen from September 1998 to December 2006. A total of 421 (24.3%) were pediatric patients, of which 165 (9.5%) were children with atopic diseases.

All 165 of these patients were sought out for re-evaluation and, due to relocations and/or telephone number changes, only 107 (64.8%) were successfully contacted.

The age of these children at the first visit was between 0 and 14 years (mean age: 6.5 years) and at follow-up between 5 and 24 years (mean age 13.8 years). The mean length of the long-term follow-up (≥ 5 years) was 7.4 years (7.2 years for atopic dermatitis; 7.5 years for allergic rhinitis; 7.2 years for asthma). Both the main disease and the overall symptom picture were evaluated for each patient.

Table 2 shows the results of the homeopathic treatment in the 161 atopic patients who had received follow-up from 1998 to 2014, evaluated with GHHOS. Improvements to the initial state took place in more than 90% of cases. There was considerable improvement (GHHOS +2, +3, +4) in 75.8% of cases, with more evident improvement in dermatitis (80.3%) and allergic rhinitis (84.2%), and less improvement in asthma symptoms (67.2%).

Table 3 shows the evolution of symptoms at the long term follow-up in 107 patients with atopic dermatitis, allergic rhinitis, and asthma as main pathologies. In the case of atopic dermatitis as main pathology, 32/38 (84.2%) obtained a complete remission of the atopic dermatitis symptoms and the remaining 6 (15.8%) had a persistence only of mild dermatitis. Wilcoxon's test was significant for $p = 0.000$. Out of 27 patients with allergic rhinitis as the main disease, 13 (48.1%) obtained complete remission of the allergic rhinitis symptoms, 9 (33%) presented mild/intermittent (episodic) symptoms, 2 (7.4%) maintained mild/persistent symptoms, 2 had moderate/persistent symptoms, and only 1 (3.7%) still had severe symptoms. Wilcoxon's test is significant for $p = 0.000$. Out of 42 patients with asthma, 30 (71.4%) obtained complete remission of the asthmatic symptoms, confirmed by a normal spirometry test, 7 (16.7%) presented mild/intermittent (episodic) symptoms, and only 5 (11.9%) maintained mild/persistent symptoms. Wilcoxon's test is significant for $p = 0.000$.

Table 4 presents the picture of patients with different atopic diseases and their evolution as assessed at the long term follow-up. Out of 107 patients, 30 (28%) presented

Table 1 Characteristics of atopic patients consecutively visited from 1998 to 2014 at first visit (n. 325) and at follow-up (n. 161)

Number of patients	0–6 years		7–14 years		Total		Follow-up	
	n.	(%)	n	(%)	n.	(%)	n	(%)
	177	55.5	148	45.5	325	100	161	49.5
Sex								
Male	96	54.2	99	66.9	195	60	97	49.7
Female	81	45.8	49	33.1	130	40	64	49.2
Patients who had already used conventional treatment for the existing disease at the time of the first visit								
Yes	136	76.8	121	81.8	257	79.1	126	49.0
Patients who had already used homeopathic treatment for the existing disease at the time of the first visit								
Yes	35	19.8	29	19.6	64	19.7	30	46.9
Atopic diseases (AD)								
Atopic dermatitis	88	49.7	38	25.7	126	38.8	56	44.4
Allergic rhinitis	17	9.6	55	37.2	72	22.2	38	52.8
Asthma	72	40.7	55	37.2	127	39.1	67	52.8

Table 2 Results of homeopathic treatment in 161 atopic patients at follow-up (1998–2014) evaluated with GHHOS

<i>Atopic pediatric patients in follow-up n. 161/325 (49.5%)</i>	<i>GHHOS 0 No changes (%)</i>	<i>GHHOS +1 Slight improvement (%)</i>	<i>GHHOS +2 Moderate improvement (%)</i>	<i>GHHOS +3 Major improvement (%)</i>	<i>GHHOS +4 Resolution (%)</i>	<i>GHHOS +2, +3, +4 (%)</i>
Atopic dermatitis (n. 56)	1 (1.8)	10 (17.9)	9 (16.1)	10 (17.9)	26 (46.4)	45 (80.3)
Allergic rhinitis (n. 38)	2 (5.3)	4 (10.5)	9 (23.7)	11 (28.9)	12 (31.6)	32 (84.2)
Asthma (n. 67)	7 (10.4)	15 (22.4)	10 (14.9)	16 (23.9)	19 (28.4)	45 (67.2)
Total (n. 161)	10 (6.2)	29 (18.0)	28 (17.4)	37 (23.0)	57 (35.4)	122/161 (75.8)

Table 3 Distribution of patients by level of severity at first visit and at long term follow-up (n. 107)

<i>Severity of atopic diseases at the first visit</i>	<i>Severity of atopic diseases at long-term follow-up</i>					<i>Significance at Wilcoxon t-test (2 tales) p</i>
	<i>Absence/remission Clear*</i>	<i>Mild/intermittent (episodic)</i>	<i>Mild/persistent Mild*</i>	<i>Moderate/persistent Moderate*</i>	<i>Severe/persistent Severe*</i>	
Atopic dermatitis (n. 38)	32 (84.2%)	—	6 (18.8%)	0	0	<0.001
Mild* (n. 14)	13	—	1	0	0	
Moderate* (n. 18)	14	—	4	0	0	
Severe* (n. 6)	5	—	1	0	0	
Allergic rhinitis (n. 27)	13 (48.1%)	9 (33.3%)	2 (7.4%)	2 (7.4%)	1 (3.7%)	<0.001
Mild intermittent (episodic) (n. 2)	2	0	0	0	0	
Mild persistent/mild (n. 6)	4	1	1	0	0	
Moderate persistent/moderate (n. 12)	4	6	1	1	0	
Severe persistent/severe (n. 7)	3	2	0	1	1	
Asthma (n. 42)	30 (71.4%)	7 (16.7%)	5 (11.9%)	0	0	<0.001
Mild intermittent (episodic) (n. 8)	8	0	0	0	0	
Mild persistent/mild (n. 16)	10	5	1	0	0	
Moderate persistent/moderate (n. 13)	9	1	3	0	0	
Severe persistent/severe (n. 5)	3	1	1	0	0	

* NICE categorization of physical severity of atopic eczema.

other atopic conditions alongside their primary complaint: 9 had both asthma and allergic rhinitis, 16 had asthma and atopic dermatitis, 4 had allergic rhinitis and atopic dermatitis, and 1 had asthma, allergic rhinitis and atopic dermatitis. Of these 30 patients, 12 (40%) obtained complete remission of all the associated diseases.

Two patients who initially presented only atopic dermatitis later developed asthma, one in mild form (an episode once a year), and the other in moderate form. At the first visit these patients already presented positivity to the Prick test: a 1-year-old male patient resulted positive to egg, grass, and peanut, while a 4-year-old female patient

Table 4 Distribution and evolution of atopic diseases at first visit and at long term follow-up (n. 107)

<i>Atopic diseases First visit</i>	<i>Long term follow-up visit</i>						<i>Remission (%)</i>
	<i>Asthma</i>	<i>Allergic rhinitis</i>	<i>Atopic dermatitis</i>	<i>Asthma & allergic rhinitis</i>	<i>Atopic rhinitis & allergic dermatitis</i>	<i>Asthma, allergic rhinitis, & atopic dermatitis</i>	
Atopic dermatitis (n. 30)	2	1	5	0	0	0	22 (73.3)
Allergic rhinitis (n. 21)	0	11	0	0	0	0	10 (47.6)
Asthma (n. 26)	9	5	0	0	0	0	12 (46.2)
Asthma & allergic rhinitis (n. 9)	0	5	0	1	0	0	3 (33.3)
Asthma & atopic dermatitis (n. 16)	3	2	3	0	1	0	7 (43.8)
Allergic rhinitis & atopic dermatitis (n. 4)	0	2	0	0	0	0	2 (50.0)
Asthma, allergic rhinitis & atopic dermatitis (n. 1)	0	0	0	1	0	0	0 (0.0)
Total (n. 107)	14	26	8	2	1	0	56 (52.3)

Table 5 Persistence or complete remission of atopic symptoms at the long term follow-up in pediatric patients with asthma and dermatitis in relation to positive or negative results of the RAST or Prick test at the time of the first homeopathic visit

Main atopic diseases	Prick/RAST test	N.	Complete remission of symptoms		Significance*
			Yes	No	
Asthma (n. 42)	Negative	17	9 (52.9%)	8 (47.1%)	$p = 0.175$
	Positive	25	8 (32.0%)	17 (68.0%)	
Atopic dermatitis (n. 38)	Negative	24	20 (83.3%)	4 (16.7%)	$p = 0.029$
	Positive	14	7 (50.0%)	7 (50.0%)	

* Pearson's chi squared two ways significance.

resulted positive to dust, mite, cat and dog, and allergic to cortisone and antibiotics.

In Table 5 we analyzed persistence or complete remission of atopic symptoms in pediatric patients with dermatitis (N. 38) and asthma (N. 42) in relation to results of the RAST or Prick test at the time of the first homeopathic visit. Patients negative at the RAST or Prick test have more frequently complete remissions compared to patients positive at the RAST or Prick test (52.9% vs 32.0% for asthma and 83.3% vs 50.0% for dermatitis) but the results are statistically significant for dermatitis ($p = 0.029$) and not for asthma ($p = 0.175$).

The most frequently and most effective remedies prescribed in pediatric atopic diseases were *Pulsatilla* (19.2%), *Natrum sulphuricum* (17.9%), Sulphur (14.1%), *Arsenicum album* (12.8%), Silicea (6.4%), *Calcarea carbonica* (5.1%), and Phosphorus (5.1%). More in details, in asthma: *Natrum sulphuricum*, *Arsenicum album*, *Pulsatilla*, Silicea; in allergic rhinitis: *Pulsatilla*, *Arsenicum album*, *Arsenicum iodatum*, *Sticta pulmonaria* and in atopic dermatitis: Sulphur, *Pulsatilla*, *Natrum sulphuricum*, Phosphorus.

Bias

This study reports on clinical activity carried out since 1998 and therefore it was not possible to compare the results of homeopathic treatment in atopic patients with those of a control group, but only with data in the literature. In the future, it will be necessary to document the efficacy of homeopathy with randomized and controlled studies, if possible compared with the placebo.

Another potential bias is represented by the fact that a very general, non-specific method of evaluation (formerly GHOS, now ORIDL) was used as outcome measures, while more appropriate criteria were employed to classify the symptoms for a retrospective study of the clinical records of the patients.^{25–27}

Discussion

The effectiveness, if not the efficacy, of homeopathy in the treatment of allergic/atopic diseases, especially in pediatric age, is controversial. Various studies, even quite recent ones, have shown positive results for allergic rhinitis,²⁷ but there are also negative ones.²⁸ The methodology for homeopathic prescription varies from study to

study and this limits a correct evaluation of the effects of treatment. In fact, personalized homeopathic treatment is used in some cases, but homeopathic extracts of the same pollen causing the allergy (*Isopathic treatment*) are administered for allergic rhinitis. In other cases, specific remedies such as *Galphimia glauca* are prescribed for allergic rhinitis.²⁹

In a previous study, we documented the positive effect of homeopathy in the treatment of long-term atopic dermatitis.¹⁷ In the present study we decided to evaluate the ways in which homeopathic treatment can not only develop a positive action (by reducing the symptoms of each topical disease), but also interfere with the progression of the so-called 'allergic march' (by interrupting the development of allergic respiratory diseases) in pediatric patients with atopic dermatitis.

Atopic dermatitis often represents the first step in the allergic march and is one of the main risk factors for the development of allergic rhinitis (up to 77% of cases) and asthma (from 20% to 68% of cases).³⁰ According to Sporik et al. (1991),³¹ the lifetime occurrence of eczema, wheeze, and hay fever in babies at risk of developing atopic disorders followed up prospectively for 11 years was 46%, 63%, and 56%, respectively. About 1 in every 3 children with eczema develops asthma during later childhood according to van der Hulst and colleagues (2007).³²

If we compare the results of our patients, in which the evolution from atopic dermatitis to asthma or allergic rhinitis is about 10%, with these data from the literature, at a distance of time ranging from 5 to 10 years (on average more than 7 years), the evolution from atopic dermatitis to respiratory allergic diseases in children treated with homeopathy appears to be considerably reduced. Indeed, our long-term results show complete remission in 71.4% of cases of asthma, in 48.1% of cases of allergic rhinitis, and in 84.2% of cases of atopic dermatitis. If we compare the literature data³¹ with the results obtained with homeopathic treatment, the latter seem to be actually better in cases of asthma and atopic dermatitis, whereas we have comparable results in cases of allergic rhinitis.

According to Rhodes and colleagues (2001), asthma appears in adult age for 40% of children with AD and allergic rhinitis.³³ In another study 94 children with atopic dermatitis were followed up to 8 years of age. During the follow-up, the eczema improved in 82 of the 94 children, but 43% developed asthma and 45% allergic rhinitis.³⁴ Furthermore, in a larger multicenter study (MAS) studying the

atopic march in 1314 children during a 7-year study period, by 5 years of age, 50% of children with early AD and a strong family history of allergy had allergic airway disease.³⁵

If we compare our data with the results of a similar study carried out in our region (Tuscany) on 77 children re-evaluated 9 years later, we can observe a higher persistence of AD at a distance of eight years from the start of treatment (46%) and of the evolution into asthma (43%).³⁶

Moreover, we can observe how the homeopathic therapy reduces the intensity of the symptoms even when dermatitis, rhinitis and asthma tend to persist over time, they decrease in intensity, in contrast to what generally happens with conventional treatment.

Of the 107 cases with long term follow-up examined in our study, 30 (28%) presented two or more concomitant atopic diseases. However, even in these more complex cases, the patients obtained complete remission of symptoms in 40% of cases ($n = 12$) with no evolution into other atopic diseases, while 28/30 patients (93.3% of cases) obtained remission of at least one of the initial diseases.

In a cross-sectional study conducted on 2270 children with physician-confirmed AD, 71.3% reported at least one additional form of atopy (symptoms of asthma or allergic rhinitis) and 38.0% reported symptoms of asthma and allergic rhinitis. By age 3 years, nearly 66% reported at least one additional form of atopic diseases.³⁷

Therefore, we see positive results not only in the short term (as previously documented for respiratory atopic diseases, allergic rhinitis, and asthma, as well as atopic dermatitis),³⁸ but also in the long term.

In order to evaluate the risk of evolution from atopic pediatric to adult patients, several factors should be taken into account: family background and genetic factors, paracetamol use, air pollution, and frequency of viral respiratory infections, to list only the most important. According to our data, the early positivity of RAST or Prick tests also seems to be a prognostic factor for persistent dermatitis and its evolution into other atopic diseases (allergic rhinitis or asthma) during long-term follow-up.

Additionally, other factors limiting risk and reducing the development of the allergic march should be considered in the prevention phase. These include the use of probiotics, breastfeeding, and a diet containing high levels of antioxidants and n-3 polyunsaturated fatty acids.³⁹

On the basis of this study, homeopathic treatment could be added to these positive factors; it could act not only *per se* on the basis of the principle of similars, but also as a sort of 'desensitizing vaccine', since many of the remedies used in homeopathy, especially for allergic rhinitis, derive from the plant world (*Pulsatilla pratensis*, *Sabadilla*, etc.). Another hypothesis could be that the positive action of homeopathy reduces the systematic use of conventional treatments for atopic symptoms, antihistamines, and cortisones. According to the vision of classical homeopathy, these only seem to suppress the ultimate symptoms of the atopic disease, without removing the causes. This would render the symptoms chronic, therefore promoting the persistence of atopic diseases into adulthood, or the evolution of atopic

dermatitis into the respiratory system. Further in-depth studies carried out on a larger sample of patients will be necessary to confirm or contradict these hypotheses.

Conclusion

The results of our study evidence the positive long-term therapeutic effects of homeopathy in children suffering from atopic diseases, especially in atopic dermatitis and asthma, but also with positive results in allergic rhinitis. According to our preliminary data, compared to the data in the literature, pediatric patients treated with homeopathy would seem to show a reduced tendency to maintain atopic dermatitis and/or develop asthma and allergic rhinitis in adult age. The early positivity of RAST or Prick tests seems to be a prognostic factor for persistent atopic dermatitis and asthma at long-term follow-up.

Conflict of interest

No conflict of interest. All the costs for this study were supported by the Public Health System of the Region of Tuscany.

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References

- 1 Bousquet J, Khaltaev N, Cruz AA, et al. Allergic rhinitis and its impact on asthma (ARIA) 2008 update (in collaboration with the World Health Organization, GA(2)LEN and Allergen). *Allergy* 2008; **63**(suppl. 86): 8–160.
- 2 Pawankar R, Canonica GW, Holgate ST, Lockey RF. *WAO white book on allergy 2011–2012: executive summary*. World Health Organization. Available at: http://www.worldallergy.org/publications/wao_white_book.pdf; 2011 (Accessed in February 2016).
- 3 Bousquet J, Khaltaev N. *Global surveillance, prevention and control of chronic respiratory diseases. A comprehensive approach. Global alliance against chronic respiratory diseases*. World Health Organization, ISBN 978 92 4 156346 8; 2007.
- 4 Asher MI, Montefort S, Björkstén B, et al. Worldwide time trends in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and eczema in childhood: ISAAC phases one and three repeat multi-country cross-sectional surveys. *Lancet* 2006; **368**: 733–743.
- 5 Anandan C, Nurmatov U, van Schayck OC, Sheikh A. Is the prevalence of asthma declining? Systematic review of epidemiological studies. *Allergy* 2010; **65**: 152.
- 6 Bloom B, Cohen RA, Freeman G. Summary health statistics for U.S. children: National Health Interview Survey, 2009. National Center for Health Statistics. *Vital Health Stat* 2010; **10**(247).
- 7 Knudsen TB, Thomsen SF, Nolte H, Baker V. A population-based clinical study of allergic and non-allergic asthma. *J Asthma* 2009; **46**: 91–94.
- 8 Stensen L, Thomsen SF, Backer V. Change in prevalence of atopic dermatitis between 1986 and 2001 among children. *Allergy Asthma Proc* 2008; **29**: 392–396.
- 9 Peroni DG, Piacentini GL, Bodini A, Rigotti E, Pigozzi R, Boner AL. Prevalence and risk factors for atopic dermatitis in pre-school children. *Br J Dermatol* 2008; **158**: 539–543.
- 10 Williams HC. Clinical practice. Atopic dermatitis. *N Engl J Med* 2005; **352**: 2314–2324.

- 11 Silverberg JI. Healthcare utilization, patient costs, and access to care in US adults with eczema: a population-based study. *JAMA Dermatol* 2015 Jul; **151**(7): 743–752.
- 12 Hughes R, Ward D, Tobin AM, Keegan K, Kirby B. The use of alternative medicine in pediatric patients with atopic dermatitis. *Pediatr Dermatol* 2007; **24**(2): 118–120.
- 13 Jensen P. Use of alternative medicine by patients with atopic dermatitis and psoriasis. *Acta Derm Venereol* 1990; **70**(5): 421–424.
- 14 Slader CA, Reddel HK, Jenkins CR, Armour CL, Bosnic-Anticevich SZ. Complementary and alternative medicine use in asthma: who is using what? *Respirology* 2006 Jul; **11**(4): 373–387.
- 15 Simpson N, Roman K. Complementary medicine use in children: extent and reasons. A population-based study. *Br J Gen Pract* 2001 Nov; **51**(472): 914–916.
- 16 Da Frè M, Voller F. *Regional survey on complementary medicine, bio-natural and wellness practices (2010). Unit of Epidemiology, Regional health agency of Tuscany. Collana dei Documenti ARS 56.* Available at: https://www.ars.toscana.it/files/pubblicazioni/Volumi/2011/56_medicine_complementari.pdf; 2011 (Accessed in February 2016).
- 17 Rossi E, Bartoli P, Bianchi A, Da Frè M. Homeopathy in paediatric atopic diseases: long-term results in children with atopic dermatitis. *Homeopathy* 2012; **101**: 13–20.
- 18 *Tuscany region (2014) regional law of Tuscany no. 9/2007.* Available at: <http://raccoltanormativa.consiglio.regione.toscana.it/articolo?urndoc=urn:nir:regione.toscana:legge:2007-02-19;9&pr=idx,0;artic,0,1;articparziale,0> (Accessed in February 2016).
- 19 *Practice of complementary medicine by medical doctors and dentists, veterinaries and pharmacists. Memorandum of intent of R. L. n. 9/2007.* Available at: http://www.regione.toscana.it/documents/10180/70874/Delibera%2049_08/98fe234d-6212-4013-99d0-4d1d6e51e7bd (Accessed in February 2016).
- 20 De Schepper L. LM potencies: one of the hidden treasures of the sixth edition of the organon. *Br Homeopath J* 1999; **88**: 128–134.
- 21 Rezzani CM. WinChip: computerized homeopathic investigation program: a data collection tool to help the doctor in daily practice and a real instrument to prove and improve homeopathy. *Proceedings of the International Conference "Improving the success of homeopathy 2. Developing and demonstrating effectiveness" London, 15–16 April 1999*, pp 32.
- 22 Reilly D, Taylor M. The evidence profile. Developing integrated medicine. *Complement Ther Med* 1993; **1**(1): 1–50.
- 23 Reilly D, Stewart W, Mercer SW, Bikker AP, Harrison T. Outcome related to impact on daily living: preliminary validation of the OR-IDL instrument. *BMC Health Serv Res* 2007; **7**: 139.
- 24 Williams HC, Burney PGJ, Pembroke AC, Hay RJ. The U.K. working party's diagnostic criteria for atopic dermatitis. III. Independent hospital validation. *Br J Dermatol* 1994; **131**: 406–416.
- 25 Lewis-Jones S, Muggleston MA. Management of atopic eczema in children aged up to 12 years: summary of NICE guidance. *BMJ* 2007; **335**: 1263–1264.
- 26 Jenkinson SG, Peters JI. *Pearls from the National Institutes of Health. Asthma guidelines, PCCU lesson 19, Vol 13*, pp 2.
- 27 Ullman D, Frass M. A review of homeopathic research in the treatment of respiratory allergies. *Altern Med Rev* 2010; **15**(1): 48–58.
- 28 White A, Slade P, Hunt C, Hart A, Ernst E. Individualised homeopathy as an adjunct in the treatment of childhood asthma. *Thorax* 2003 Apr; **58**(4): 317–321.
- 29 Wiesenauer M, Lüdtke R. A meta-analysis of the homeopathic treatment of pollinosis with *Galphimia glauca*. *Forsch Komplementärmed* 1996; **3**: 230–236.
- 30 Correale CE, Walker C, Murphy L, Craig TJ. Atopic dermatitis: a review of diagnosis and treatment. *Am Fam Physician* 1999; **60**(4): 1191e1198.1209–10.
- 31 Sporik R, Holgate ST, Cogswell JJ. Natural history of asthma in childhood – a birth cohort study. *Arch Dis Child* 1991; **66**: 1050–1053.
- 32 van der Hulst AE, Klip H, Brand PL. Risk of developing asthma in young children with atopic eczema: a systematic review. *J Allergy Clin Immunol* 2007; **120**: 565–569.
- 33 Rhodes HL, Sporik R, Thomas P, Holgate ST, Cogswell JJ. Early life risk factors for adult asthma: a birth cohort study of subjects at risk. *J Allergy Clin Immunol* 2001; **108**: 720–725.
- 34 Gustafsson D, Sjöberg O, Foucard T. Development of allergies and asthma in infants and young children with atopic dermatitis: a prospective follow-up to 7 years of age. *Allergy* 2000; **55**: 240–245.
- 35 Lau S, Nickel R, Niggemann B, et al. The development of childhood asthma: lessons from the German Multicentre Allergy Study (MAS). *Paediatr Respir Rev* 2002; **3**: 265–272.
- 36 Novembre E, Cianferoni A, Lombardi E, Bernardini R, Pucci N, Vierucci A. Natural history of “intrinsic” atopic dermatitis. *Allergy* 2001; **56**: 452–453.
- 37 Kapoor R, Menon C, Hoffstad O, et al. The prevalence of atopic triad in children with physician-confirmed atopic dermatitis. *J Am Acad Dermatol* 2008; **58**: 68–73.
- 38 Rossi E, Bartoli P, Panozzo M, Bianchi A, Da Frè M. Outcome of homeopathic treatment in paediatric patients: an observational study from 1998 to 2008. *EIJM* 2010; **2**: 115–122.
- 39 Thomsen SF. Epidemiology and natural history of atopic diseases. *Eur Clin Respir J* 2015; **2**: 24642.