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ORIGINAL PAPER

Homeopathy in paediatric atopic diseases: long-term results in children with atopic dermatitis

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Aim: **To study the socio-demographic features, the prescribed remedies and the outcome of atopic diseases in children treated with homeopathy at the Homeopathic Clinic of Lucca (Italy), and the long-term outcome of children suffering from atopic dermatitis (AD) after an approximate 8-year period (range 5–10 years).**
Methods: **Our data derive from an observational longitudinal study carried out on 213 children (38.6%) with atopic diseases out of 551 children consecutively examined from September 1998 to December 2008. We used the Glasgow Homeopathic Hospital Outcome Score to evaluate the results that were classified on the basis of a Likert scale.**
Results: **Eighty-three (39%) children were affected by asthma, 51 (24%) by allergic rhinoconjunctivitis, 76 (36%) by AD and 3 (1%) by food intolerance. Follow-up patients were 104 (48.8%), and 65 (62.5%) of them reported a major improvement or resolution. The parents of paediatric patients suffering from AD, who had started homeopathic treatment at <4.9 years of age were invited to follow-up assessment 8 years later and 40 children (mean age 12.9) were examined; 28/40 (70%) had a complete disappearance of AD, 12/40 children (30.0%) were still affected by AD; 8/40 (20%) had asthma and 8/40 patients had, or developed, allergic rhinitis.**
Conclusion: **These preliminary results seem to confirm a positive therapeutic effect of homeopathy in atopic children. Furthermore, according to the data from the literature paediatric patients treated with homeopathy seem to show a reduced tendency to maintain AD and develop asthma (and allergic rhinitis) in adult age.** *Homeopathy* (2012) **101**, 13–20.

Keywords: Homeopathy; Atopy; Paediatrics; Atopic dermatitis; Asthma and allergic rhinitis; Long-term results

Introduction

The term 'atopy', coined in 1923 by Coca and Cooke, comes from the privative prefix α and the Greek word $\acute{\alpha}\tau o\pi\acute{\iota}\alpha$ which means – among others – 'different', 'unusual', 'out of place'.[1] Atopy originally involved only asthma and allergic rhinitis, but in 1933 atopic dermatitis (AD) was also included in the group of atopic disorders, in recognition of the close link of this form of eczema with asthma and allergic rhinitis. AD is often the first manifestation of atopic diseases.[2] Allergies generally start with AD, and develop towards food allergies in the form of gastro-intestinal, followed by respiratory conditions (rhinitis and asthma).

AD is a chronic, itchy and inflammatory skin disease caused by the interaction between susceptibility genes, environment, pharmacological abnormalities, skin barrier defects, and immunological factors.[3] Recently there has been a constant increase in the number of cases of allergy, particularly in developed countries, to such an extent that expressions like "*disease of the third millennium*" and "*allergic epidemic*" have been used to describe the

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phenomenon.[4] It is a serious and widespread health problem, with a prevalence in children between 10–20%[5] and 18–25%.[6,7] AD often represents the first step of what we can call the 'allergic march' and is one of the main risk factors for allergic rhinitis development (up to 77% of cases) and asthma (from 20% to 68% of cases).[8] According to Sporik *et al.* the lifetime prevalence of eczema, wheeze, and hay fever in babies at risk of developing atopic disorders followed-up prospectively for 11 years, were 46%, 63%, and 56% respectively.[9]

There has been an increase in the use of 'complementary' or 'alternative' medicine in patients affected by skin disease, in particular those with chronic or inflammatory dermatosis. The prevalent use of complementary and alternative medicine (CAM) in children has been estimated to be higher than 40% in the USA[10] and it has been reported recently that in the Tuscany Region of Italy more than 25% of children use CAM, and 23.4% of these consume homeopathic products.[11] The data on consecutive patient visits ($N = 1117$) to 27 doctors of medicine and of osteopathy using homeopathy showed that AD (2.6%) was in the top ten most common diagnoses.[12] In a prospective multicentre cohort study with 103 primary care practices with additional specialisation in homeopathy in Germany and Switzerland on 3981 patients (1130 children), the most common diagnosis in children of both genders was AD (20%).[13]

However, there are still only a few studies to document the efficacy of homeopathy in long-term treatment of AD and to confirm whether such treatments can influence progression towards rhinitis and asthma.

Aim of the study

To investigate the socio-demographic features, the most frequently prescribed homeopathic medicines and the outcome of atopic diseases (AD, allergic rhinitis asthma and food allergy or intolerance) in children who received homeopathic treatment at the Homeopathic Clinic of Lucca (Italy) between 1998 and 2008, and the long-term clinical evolution of paediatric patients suffering from AD after an approximate 8-year period.

Materials and methods

Design

A prospective observational cohort study concerning children affected by atopic diseases. The patients were consecutively examined at the Homeopathic Clinic of Campo di Marte Provincial Hospital of Lucca (Italy) in the period between 1998 and 2008 and their data were collected in a database. The long-term results in children with AD were been evaluated for an average period of 8 years (at least 5 years, up to 10 years) from the first visit. Figure 1 shows the process of recruitment, follow-up, and long-term evaluation of children with AD.

Setting

The Homeopathic Clinic in Lucca, funded by the Tuscany Regional government, was set up in 1998 as part of a pilot project designed to evaluate the possibility of including complementary medicine into the public health-care system. Through a number of consecutive health-care provisions, the Region financed a number of studies concerning non-conventional medicine and established a Regional Reference Centre for non-conventional therapies: acupuncture and Chinese traditional medicine in Florence, phytotherapy in Empoli and homeopathy in Lucca.[14] Homeopathic physicians have been recognized as clinical specialists since 2006, according to the Tuscan Regional Agreement of the National Integrative Agreement for Specialist Doctors.[15]

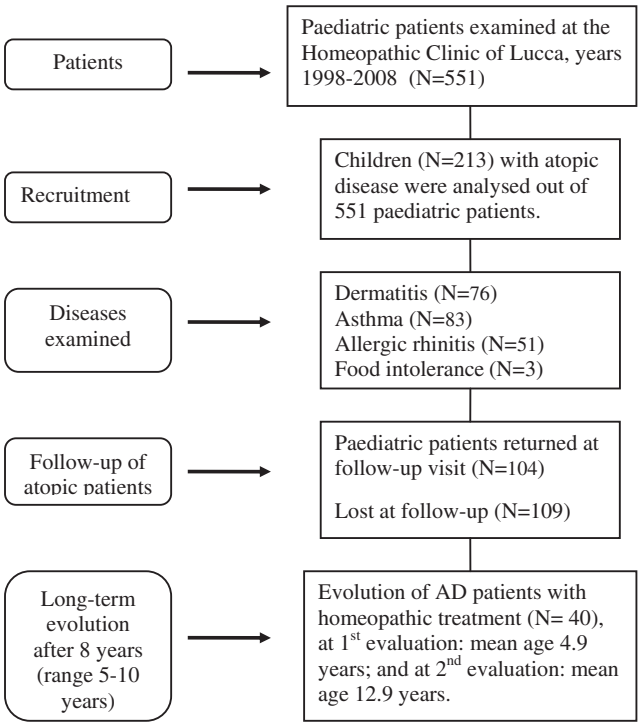

Figure 1 Flow chart of recruitment, follow-up and analysis of atopic paediatric patients with homeopathic treatment.

Patients

From September 1998 to December 2008 a total of 2141 consecutive patients were examined at the Homeopathic Clinic of Campo di Marte Provincial Hospital AUSL 2 Lucca. A total of 551 (25.7%) were paediatric patients and 213 (9.9%) of these were children with atopic diseases. The patients or their parents or guardians asking to be treated by homeopathy, either self-referred or sent by their general practitioner, can make an appointment at the Homeopathic Clinic of Lucca. Average waiting times are between 1 and 2 months. No specific admission criteria are required. The €18.59 (£16, US$26) clinical fee for a visit is the same rate charged for all the other specialist services. The Single Booking Centre (CUP) of the Campo di Marte Hospital can be directly contacted by telephone. The duration of a homeopathic visit is about half an hour.

Diagnosis

For the diagnosis of AD, we used the reference criteria proposed by Williams and colleagues.[16] These are the consensus criteria for the principal clinical features of AD that

have led to the compilation of a short list of reliable and valid discriminators, which are simple to use, in particular in the fields of epidemiology and research.

In order to diagnose the atopic disease, the patient must have experienced a condition of itchy skin (or parental report of scratching or rubbing behaviour) over the last 12 months. This is an essential sign for the diagnosis, alongside three or more of the following criteria:

1. history of skin involvement (e.g. bends of the arms, wrists, knees and ankles, and creases around the neck, ears or eyes (also the cheeks in <10-year-old-children);
2. personal history of asthma or hay fever (or history of atopic disease in a first-degree relative if the child is under 4 years of age);
3. history of dry skin in the past year;
4. start of the signs and symptoms in <2-year-old-children (this criterion is not valid in children who are less than 4 years old);
5. visible flexural dermatitis (or dermatitis involving the forehead or cheeks, and the outer aspect of limbs in children aged less than 4 years).

The diagnosis of AD depends on the exclusion of other conditions such as scabies, allergic contact dermatitis, cutaneous lymphoma, seborrheic dermatitis, psoriasis, ichthyosis, and other primary disease features.

Informed consent

The patients were asked to sign a privacy disclaimer and informed consent form for therapy. An individual identification number was assigned to all patients for anonymous treatment of the data, which were stored in a database.

Treatment

The homeopathic protocol consists in the administration of a single remedy, initially taken in Quintamillesimal, Q (or LM potency) potencies, beginning with 6Q along a progressive scale of dilutions.[17] Medicines in centesimal dilutions and at low potencies (from 6 to 30 CH) are generally used for the treatment of acute cases, but high centesimal potencies, after the starting treatment with Q potencies, are also prescribed. A more detailed description of our homeopathic modes of treatment can be found in a previous paper.[18]

On the first visit, patients with chronic or recurrent diseases previously treated with conventional drugs were requested to discontinue and slowly reduce the treatment dose, owing to the gradual improvement of homeopathic treatment. At first follow-up, generally after 2 months, we assess the effectiveness of the homeopathic treatment, to decide whether and when it is possible to leave the patient only with homeopathic treatment. Patients affected by acute illnesses were advised which homeopathic medicines to take, and were referred for conventional medical treatment if the alternative medicines were to fail.

Outcome parameters

We considered the paediatric patients with at least one follow-up contact. Follow-up measurements are taken after at least 2 months, next after 6−12−18 months, and possibly at the 2nd, 3rd, 4th, 5th year, etc. The patients' demographic data, the clinical diagnoses according to ICD 10 coding; the prescribed remedy, potency and dosage, prescription strategy, determination of the case as acute, chronic or recurrent, were collected on paper and entered into a database using the computerized clinical record Win-C.H.I.P. (Computerized Homeopathic Investigation Program).[19]

Outcomes were evaluated by the Glasgow Homeopathic Hospital Outcome Score (GHHOS)[20]; the degree of symptom intensity reported by the patient, and any regression after treatment, were calculated by a numerical rate scale (NRS). The reference values of the GHHOS scale, which are based on a Likert scale from −1 to +4, define the different degrees of improvement: 0 = none; 1 = slight improvement; 2 = moderate improvement; 3 = important improvement, 4 = cured/back to normal; and −1 = slight worsening.

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 localised 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).[21]

Patients with asthma were classified as suffering from (1) mild intermittent (episodic), (2) mild persistent, (3) moderate persistent, or (4) severe persistent asthma.[22]

Long-term evaluation

In order to properly evaluate and understand the long-term results of 71 consecutive children suffering from atopic and allergic dermatitis, examined and treated with homeopathy from 1998 to 2008, we tried to contact parents of all the children at least 5 years from the first visit (57 children out of 71). We considered both followed-up (with at least one follow-up visit) and lost to follow-up patients.

Parents were searched for and asked to return to the Clinic for a second assessment of their children, and were given a questionnaire containing a series of questions about the health conditions of their children treated by homeopathy, after an average period 8 years (at least 5 years, up 10 years) from the first visit. Some of the children had continued to follow homeopathic medicines over the years in private practices.

Statistical analysis

Data entry and encoding were performed by trained operators of the Homeopathic Clinic of Campo di Marte Hospital, Lucca, while data analysis was carried out by the project team working at the Unit of Epidemiology of the Regional Health Agency of Tuscany. Statistical analyses were performed using the statistical software package Stata

Table 1 Characteristics of atopic patients by age and proportions of patients in follow-up

	0–6 years (N = 112)	*7–14 years (N = 101)*	*Total (N = 213)*	p-*value*	*Patients in follow-up N = 104 (49%)*
	n *(%)*	n *(%)*	n *(%)*		n *(%)*
Age					
0–6 years	–	–	112 (53)		52 (50)
7–14 years	–	–	101 (47)		52 (50)
Sex					
Male	64 (57)	68 (67)	132 (62)	0.079	67 (64)
Female	48 (43)	33 (33)	81 (38)		37 (36)
Have you already used conventional therapies for treatment in the existing pathology at the time of the visit?					
Yes	89 (80)	82 (81)	171 (80)	0.172	87 (84)
No	23 (20)	19 (19)	42 (20)		17 (16)
Have you already used homeopathic therapies for treatment in the existing pathology at the time of the visit?					
Yes	91 (81)	78 (77)	169 (79)	0.656	21 (20)
No	21 (19)	23 (23)	44 (21)		83 (80)
Existing disease					
1.1 Allergic asthma	20 (18)	28 (28)	48 (23)	0.073	25 (24)
1.2 Asthma	26 (23)	9 (9)	35 (16)		17 (16)
1.3 Allergic rhinitis	10 (9)	41 (41)	51 (24)		27 (26)
2.1 AD	48 (43)	18 (18)	66 (31)		26 (25)
2.3 Allergic dermatitis	4 (4)	1 (1)	5 (2)		3 (3)
2.6 Urticaria	1 (7)	4 (7)	5 (7)		5 (5)
6.4 Food intolerance	3 (3)	0 (2)	3 (1)		1 (1)
Total	112 (100)	101 (100)	213 (100)		104 (100)

SE (version 10.0). The relationship between age and each variable was evaluated using the Chi-square test (Table 1).

Results

We report on 213 (38.6%) children with atopic diseases out of 551 paediatric patients aged ≤ 14 years (mean age 5.9 years) consecutively visited at the Homeopathic Clinic of the Hospital of Lucca between September 1998 and December 2008.

A total of 104 (48.8%) children had at least one follow-up visit, the number of visits per child varied from 1 to 12. At 2 months, the figures were the following: 30 (28.8%); at 6 months: 20 (19.2%); at 12 months: 19 (18.3%); at 18 months: 12 (11.5%) and at ≥24 months: 23 (22.1%). There were no significant differences between follow-up and non follow-up patients in terms of demographic and clinical features.

Table 1 shows the characteristics of atopic children by age and the proportions of follow-up patients. Infants affected by atopic diseases were 213 (38.6% of all paediatric patients), 83 (15%) suffered from asthma of which 48 (8.7%) allergic asthma; allergic rhinoconjunctivitis: 51 (9.2%); 76 with dermatological diseases, 71 with AD: (13.8%) of which 5 (0.9%) with allergic dermatitis, and 5 (0.9%) with urticarioid reactions as well. Food intolerance: 3 (0.5%). 62% were male.

80% of children had used conventional medicine for the treatment of the diseases for which they came to the clinic of these, only 31% had previously been treated by homeopathic medicines. There were no significant differences between age and the variables listed in Table 1.

Table 2 shows the number and proportion of atopic paediatric patients grouped by disease and age, with follow-up and with important improvement or resolution of the disease (GHHOS = 3–4). Follow-up patients were 104 (48.8%), the majority presented with asthma: 42 (40%), while patients with major improvement (GHHOS = 3) or resolution (GHHOS = 4) were 65 (62.5%). The children with the best outcomes seemed to be those affected by AD: 25 (73.5% of the follow-up patients with AD), followed by allergic rhinoconjunctivitis: 17 (63%), and finally with asthma: 22 (52.4%), of which 12 (48%) with allergic asthma.

Table 3 presents the most commonly used medicines for respiratory illness: *Natrum sulphuricum* (19%), *Sulphur* (18%), *Pulsatilla* (16%), *Arsenicum album* (8%), *Natrum muriaticum* (10%), *Silicea* (4%), *Calcarea carbonica* (4%), *Phosphorus* and *Lycopodium* (both 3%). If we

Table 2 Number of atopic patients grouped by diseases and age, with follow-up and patients with important improvement or resolution of the disease (GHHOS = 3–4)

Diseases	*0–6 years (%)*	*7–14 years (%)*	*Total (%)*	*Follow-up (%)**	*No. patients with GHHOS 3–4 (%)†*
Asthma	46 (41)	37 (36)	83 (39)	42 (40)	22 (52)
Rhinoconjunctivitis	10 (9)	41 (41)	51 (24)	27 (26)	17 (63)
Dermatitis	53 (47)	23 (23)	76 (36)	34 (33)	25 (74)
Food intolerance	3 (3)	0	3 (1)	1 (1)	1 (100)
Total	112	101	213	104	65 (63)

* Percentage of the total of the followed-up patients.
† Percentage of the followed-up patients for each disease.

Table 3 Most frequently prescribed remedies in atopic diseases compared to the list of the most prescribed remedies in children

Remedies	*Prescription frequency in atopic diseases (%)*	*Prescription frequency in all children (%)*
nat-s.	19	8
sulph.	18	9
puls.	16	16
ars.	8	10
nat-m.	5	10
sil.	4	6
calc.	4	5
phos.	3	4
lyc.	3	5
stict.	3	1
bry.	1	2
lach.	1	8
nux-v.	1	2
petr.	1	0.2
ars-i.	1	0.1
ign.	1	4
hep.	1	1
calc-s.	1	0.1
cham.	1	0.3
euphr.	1	0.2
kali-c.	1	0.2
calc-f.	1	0.1
apis	1	0.2
sabad.	1	0
psor.	1	0.1
arg-nit	1	1

compare the most commonly prescribed medicines for atopic conditions with the list of medicines generally administered to paediatric patients, the most frequently prescribed are, as expected, *Natrum sulphuricum* and *Sulphur*, prevalently used in asthma and AD; unexpected, is the presence of *Sticta pulmonaria*, indicated in some forms of allergic rhinitis.

To evaluate the results of long-term homeopathic treatment in children suffering from AD, we were able to contact by telephone the parents of only 40 out of the 57 children (70.2%) with at least 5 years of follow-up (Table 4). Of the 17 patients that were not found, 9 had changed residence and/or telephone number; 5 did not answer the telephone calls made at different times of the day for several days; 3 patients declared they had never followed the homeopathic therapy that had been prescribed, they were excluded from the study.

We considered both followed-up (at least one follow up visit) and lost to follow-up patients. However, we discovered that most of the children had continued to receive homeopathic treatment over the years, not in our homeopathic public clinic but in private practices. At first examination, 9 out of 40 of the children affected by AD and treated with homeopathy were also suffering from asthma (22.5% of cases) and 3 from allergic rhinitis (7.5%).

Table 4 Long-term follow-up of homeopathic treated children affected by AD and asthma/allergic rhinitis at the first visit ($N = 40$) and persistence of AD and/or development of respiratory diseases at re-evaluation 8 years later

Long-term follow-up patients (N = 40)	*At first visit (mean age 4.9 years)*	*At re-evaluation (mean age 12.9 years)*
AD	40/40 (100%)	12/40 (30.0%)
AD and asthma	9/40 (22.5%)	8/40* (20.0%)
AD and/or allergic rhinitis	3/40 (7.5%)	8/40* (20.0%)
Prick/RAST positive	Not known	14/25† (37.5%)

* One case had both asthma and allergic rhinitis.
† Patients who performed the test.

At re-evaluation after about 8 years, 28/40 (70%) had complete disappearance of AD, while 12/40 children (30%) still had AD; 8/40 (20%) had asthma and 8/40 patients had, or developed, allergic rhinitis. However, if we consider the total of respiratory diseases, the children who developed asthma and allergic rhinitis were only 15/40 (37.5%). It was not possible to check the data relative to Prick test positivity at the 1st evaluation of the children treated with homeopathy, but at long-term evaluation 15/40 (37.5%) were positive for allergic tests, and 10 (25%) resulted negative. No data were available for 15 (37.5%).

Table 5 shows the state of AD in children treated with homeopathic medicines after 5−7−10 years (N = 40), and the severity of AD clinically assessed at the time of the first visit and at follow-up. Of the 20 homeopathic paediatric patients re-assessed at least 5 years 7 still had mild of AD; 4 out of 14 children after at least 6−7 years had moderate dermatitis; 6 children were re-evaluated after 10 years only 1 of them still had mild AD. No child had 'severe' AD at long-term re-evaluation. When homeopathic treatment was started, 8 children had mild AD, 27 moderate and 5 severe AD.

The majority of children with onset or persistence of allergic rhinitis, 5/8 (63%), had mild disease, while a moderate was reported in 3 cases (37%) at long term follow-up.

Four children had a 'mild intermittent (episodic)', 2 'mild persistent', and 2 'moderate persistent' asthma at long-term follow-up. All these patients with asthma or allergic rhinitis were Prick test (or RAST) positive, but no child presented any severe form of respiratory disease.

Discussion

Many different studies in literature have demonstrated the effectiveness and efficacy of homeopathy in allergic rhinitis[23−29] and in asthma,[30−35] but homeopathic immunotherapy has demonstrated to be ineffective in the treatment of patients with asthma.[36] Nearly 40% of paediatric subjects come to our homeopathic clinic of Lucca because of atopic problems, a total of 63% of children suffering from atopic condition reported a high level of improvement or resolution of the problem (GHHOS 3−4).[18]

In a previous study we have demonstrated the positive effects of homeopathy in the treatment of respiratory diseases through a cost-benefit analysis of these conditions in a case study of subjects (also paediatric) affected by asthma and allergic rhinitis, where we observed that in patients affected by respiratory diseases (asthma and rhinitis) the reduction of consumption of conventional drugs specific for asthma in the first year of the homeopathic treatment was: −72.96% and in the second year was: −68.20%; and in allergic rhinitis: −62.90% after the first year and −62.48% after the second year of homeopathic treatment.[37]

Table 5 Disappearance and persistence of AD after follow-up period and severity of the atopic diseases in children with homeopathic treatment at re-evaluation

	Time 0 (N = *40*)	*5 years* (N = *20*)	*6–7 years* (N = *14*)	*8–10 years* (N = *6*)	*Total* (N = *40*)
Disappeared AD		13	10	5	28/40
Persisting AD	40				12/40
Mild	8	**7**	–	1	8
Moderate	27	–	4	–	4
Severe	5	–	–	–	–

Severity of asthma and allergic rhinitis in children with AD

	Mild intermittent	Mild persistent	Moderate persistent	Total
Asthma	4	2	2	8
	Mild	**Moderate**	**Severe**	**Total**
Rhinoconjunctivitis	5	3	0	8

Surprisingly, there are few data in literature about the effectiveness and efficacy of homeopathy in the treatment of AD given the high number of paediatric homeopathic patients and the data of existing studies have provided rather contradictory results. A controlled double-blind randomized study in atopic eczema did not evidence a higher effect of individualized homeopathic treatment compared to placebo.[38] Homeopathic treatment did not seem to be superior to conventional treatment for paediatric patients with mild to moderate atopic eczema,[39] whereas another study showed more positive therapeutic effects.[40]

The scarce literature on the subject may be explained in part by the difficulties in an important theoretical and methodological problem of classical homeopathy: how to treat a disease that the homeopathic doctrine sees as a manifestation of the vital force's efforts to drain out of the organs the toxins (the problems) that are in the body and that pose a threat to the health of the vital organs and systems. Therefore, it is necessary to treat the skin without 'suppressing' the symptoms so that, once they have been removed from the surface, they no longer reappear internally, causing what has been called 'morbid metastasis'. For this reason, Waisse-Priven and colleagues conducted a clinical study designed to demonstrate the effectiveness of classic, dermatological, personalized homeopathic treatment, also analyzing the possibility of manifestations of homeopathic suppression, no such manifestation was detected.[41]

None of the data of our study seem to show the suppression of external dermatological symptoms and the onset of respiratory symptoms as a result of therapeutic intervention. Instead, the effects of homeopathic treatment in dermatitis seem to have been positive. Furthermore, children with better outcome (GHHOS = 3–4) actually seem to be those with AD, namely 73.5% of the followed-up patients with AD. In our paediatric cases there is certainly a progression of dermatitis towards respiratory allergic conditions, but the phenomenon is reduced and apparently none of the patients displayed a migration of AD into asthma. The patients who still had dermatitis and asthma after some years, presented slight and reduced symptoms of these conditions, mainly in AD, if compared to the severity of the disease at the time of the first consultation. Moreover, the severity of respiratory diseases at long-term follow-up was mild in most of the cases. In some cases, as documented in another study, after the homeopathic prescription there was a disappearance of the respiratory disturbances, also asthma, and a temporary manifestation of skin symptoms (37% of cases) as an expression of homeopathic aggravation.[42]

As concerns long-term progression of the illness, our data show that, compared to the 'atopic march', the long-term evolution of the disease under homeopathic treatment seems to be positive compared to the general data of literature, although the percentage of the evolution from AD to asthma and rhinitis varies considerably.[42] According to a study carried out by Rhodes and colleagues, asthma appears in adult age in 40% of children with AD and allergic rhinitis[43]; in another study 43% of the patients developed asthma during the 8 years and 45% developed allergic rhinitis.[44] 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.[45] Asthma prognosis is known to be worse in paediatric patients suffering from AD. At 10-year follow-up assessment of the natural course of asthma, 34% of children with a history of AD and asthma performed well, 54% had mild asthma, 11% severe asthma; instead, 41% of the patients without AD were well, 52% had mild asthma, 5% severe asthma.[46]

The results of our study seem to show lower rates (20%) than those in the literature. If we compare our data with the results of a similar study documenting the progress of the 'atopic march' in the paediatric population with conventional treatment by the Allergy and Clinical Immunology Unit – Department of Pediatrics of the A. Meyer Hospital of Florence[47] carried out on 77 children re-evaluated 9 years later, we can observe a reduction both in the persistence of AD at a distance of 8 years from the start of treatment (30.0% *versus* 46%) and of the natural course of asthma (20.0% *versus* 43%). However, we should remember that there are a many parameters that have not been considered (level of severity of the disease at zero time, familiarity of the disease in the two groups, etc.), nevertheless our data would seem to confirm the usefulness of homeopathic treatment in reducing progression of the atopic disease, from AD to asthma, and also the persistence of dermatitis after the paediatric age.

It would certainly be useful to develop future long-term prospective observational studies examining homogeneous groups of paediatric patients and then to compare the

outcomes of homeopathic *versus* conventional treatment. This would allow us to evaluate not only a reduction in the symptoms during the acute phases of AD, but also a progression of the atopic disease towards respiratory phases.

Conclusion

The outcomes of our study evidence the positive therapeutic effects of homeopathy in children suffering from atopic diseases, especially in AD and allergic rhinoconjunctivitis. According to our preliminary data compared to the data in literature, paediatric patients treated with homeopathy would seem to show a reduced tendency to maintain AD and/or to develop asthma (and rhinoconjunctivitis) in adult age.

Conflict of interest

No conflict of interest declared. This study was supported by the Public Health System of the Tuscany Region (Italy).

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