

Atopic Dermatitis in Tuen Mun Skin Clinic

A survey of patient's characteristics, severity, prognosis and the family impact

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ABSTRACT

Atopic dermatitis (AD) is a common skin problem in Hong Kong. This study attempts to delineate characteristics of patients with atopic dermatitis attending Tuen Mun Social Hygiene Clinic and assess its related family impact. Within a period of 2 months, 68 patients who satisfied the U.K. criteria for AD were interviewed. The patient's characteristics, clinical course, outcome and the family impact were recorded. Most of these parameters were found to be comparable to that in the developed countries. An inverse relationship was noted between the outcome of AD and associated atopic respiratory disease whereas the family impact of the disease in terms of time and money spent on the disease was not particularly great in our series.

Keywords: Hong Kong, atopic dermatitis

INTRODUCTION

Atopic dermatitis (AD) is a common skin disease worldwide. Affected children have irritable skin. Parents may have to lay aside their work in order to look after the patients. The Government has to spend a lot of money every year to pay for the treatment.¹

The pathogenesis of the disease is still unclear. To facilitate study comparison, the definition of AD has recently been re-defined.² The triggering factors are a subject of recent intensive research. Various new modalities of treatment have been on trial. Nevertheless, the incidence of atopic dermatitis is still increasing.³

In Hong Kong, atopic dermatitis is a very common skin problem seen in our local skin clinics run by the Social Hygiene Service. Almost one third of the new cases attending our clinic in 1996 suffered from eczema.⁴ Before any suggestion could be made on the management of our patients with AD, a better understanding of their basic epidemiological

characteristics is essential; factors that may aggravate their skin conditions should be sought; the clinical severity of their disease and the outcome of the skin condition should be documented. An attempt to correlate the clinical severity and outcome with patient's characteristics may help to delineate different subgroups of patients and give an indication of their prognosis.

Tuen Mun is a new town situated in the north west of the new territories. It has a population of around 460,000. Our Tuen Mun skin clinic is the only outpatient specialist clinic that serves the area. Our sample may be representative of patients with atopic dermatitis at large.

OBJECTIVES

The present survey aims to:

- (i) Obtain a profile of local patients' characteristics, namely their age, sex, age of onset, personal and family history of atopic respiratory diseases (ARD), triggering factors, the percentage of nasal and skin carriage of *Staphylococcus Aureus*.
- (ii) Measure the clinical severity of patient's conditions at the time of interview.
- (iii) Document the clinical outcome of patient's skin and related atopic respiratory diseases.

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- (iv) Correlate the clinical severity and outcome with patient's characteristics.
- (v) Evaluate the family impact of atopic dermatitis (Appendix I).

METHODOLOGY

Patient who attended Tuen Mun Social Hygiene Clinic during the period from November 1997 and January 1998 and fulfilled the diagnostic criteria set by the U.K. Working Party (Appendix II), were recruited. Verbal consent was obtained and data regarding the patient's age, sex, age on onset, personal and family history of atopic respiratory disease, clinical symptoms, clinical course of disease, triggering factors, clinical outcome and family impact of the disease were gathered from the patients and/or their accompanied caretakers.

Each patient was then assessed by the same dermatologist (N.M.Luk) for the severity of their skin disease using the Six Area and Six Sign Atopic Dermatitis Severity Score (SASSAD) method.⁵ A score under 15 was taken as mild, 15-24 as moderate and 25 or above as severe dermatitis. A nasal and a skin swab for bacterial culture were also performed.

Altogether 68 patients were successfully recruited. The data was then analyzed using the Statistical Package for Social Science. For each patient, a severity rank was calculated based on the method adopted by Rajka G and Langeland T⁶ with a following modification: the 'extent' of disease parameter was replaced by the mild, moderate and severe score of SASSAD. This was advantageous, as it was sometimes difficult to assess the extent of AD if the disease was mild. Besides, the SASSAD took into account of different types of skin lesions.

RESULTS

Sixty-eight patients fulfilled the diagnostic criteria proposed by the U.K. Working party 1994.² The mean age of the study group was 8.35 years with the youngest of age 0.92 years and the oldest 19 years (Table 1). Divided by clinical stage, 5 belonged to the infantile stage (≤ 2 years), 52 in the childhood stage (3 - 11 years) and the remaining 11 in the adult stage (>12 years).

Overall the male to female ratio was 1:2.8 with

Table 1. Patient's characteristics of Atopic Dermatitis

| | Frequency (%) |
|------------------------------|---------------|
| Age (mean=8.35 yr) | |
| 0 - 5 | 17 (25) |
| 5 - 10 | 26 (38.2) |
| 10 - 15 | 20 (29.4) |
| 15 - 20 | 5 (7.4) |
| Sex | |
| Male | 18 (26.5) |
| Female | 50 (73.5) |
| Age of onset (mean 1.17 yr) | |
| Less than or = 1 | 43 (63.2) |
| >1 to 5 | 24 (35.3) |
| > 5 | 1 (1.5) |
| Personal history ARD | |
| Asthma | 17 (25) |
| Allergic rhinitis | 23 (33.8) |
| Family history ARD | 46 (67.6) |
| Atopic tendency | |
| Neither | 13 (19.1) |
| Both | 31 (45.6) |
| Symptom (itch) | |
| Occasionally disturb sleep | 55 (80.9) |
| More than occasionally | 10 (14.7) |
| Continually | 3 (4.4) |
| Clinical course | |
| > 3 months remission/yr | 11 (16.2) |
| < 3 months remission/yr | 8 (11.8) |
| Continuous course | 49 (72.1) |

obvious female predominance. Further break-down by age group showed that at age 2 years or less, the male to female ratio was approximately equal whereas the female predominance was more obvious in the older age groups (Fig 1).

Sixty-seven (98.5%) patients had their age of onset below 5 years and 43 (63.2%) below one year. Only one (1.5%) patient had age of onset after 5 years. The mean age of onset was 1.17 year.

Forty (58.8%) patients had a personal history of atopic respiratory disease and 46 (67.6%) patients had a family history of atopic respiratory disease. Thirty-one (45.6%) patients had both and 13 (19.1%) patients had neither.

Only 3 (4.4%) patients had itchiness that continually disturbed their sleep. Fifty-five (80.9%) had occasionally disturbance and 10 (14.7%) had their sleep disturbed more than occasionally.

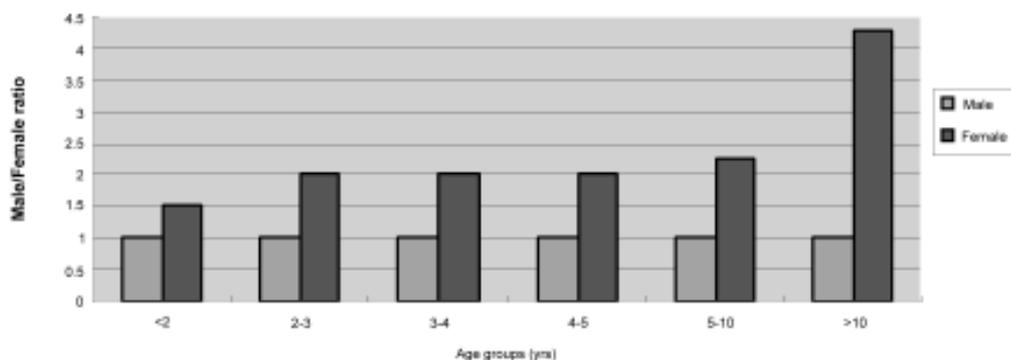


Figure 1: Male to Female ratio by age groups

Eleven (16.2%) patients had their disease in remission for more than 3 months in a year, 8 (11.8%) had less than 3 month and 49 (72.1%) had a continuous course.

Overall 13 (19.1%) patients had mild, 52 (76.5%) had moderate and 3 (4.4%) had severe disease.

Thirty (44.1%) patients had their AD triggered by food. Fifty-one (75%) patients had their AD adversely affected by weather and 52 (76.5%) by sweating. Twelve (17.6%) patients had other triggering factors that included anxiety, other illness, sun exposure and swimming in the swimming pool. More than 75% of patients had more that one triggering factors.

Over the years, 44 (64.7%) patients had their skin disease improved more than 50% while 24 (35.5%) did not. For the 40 patients who had associated atopic respiratory disease, 22 (55%) had their disease either remained static or deteriorated while the remaining 18 (45%) improved.

Staphylococcus aureus was cultured from 29 (42.7%) of the nasal swab and 15 (22.1%) of skin swab in our AD patients.

Regarding the family impact of the disease, such as influence on the daily work of caretakers, loss of attention to other family member, number of medical consultations in the past one year, and time spent on the patient per day were shown in Table 2.

DISCUSSION

Demographic characteristics and Staphylococcus aureus carriage

Most of our patients fell into the paediatric age group which confirmed that AD was mainly a childhood

Table 2. Family impact in Atopic dermatitis

| | Frequency (%) |
|--|---------------|
| <i>Work affected</i> | |
| No | 44 (64.7) |
| Slight | 14 (20.6) |
| Moderate | 8 (11.8) |
| Severe | 2 (2.9) |
| <i>Loss of attention to other family members</i> | |
| No | 53 (77.9) |
| Slight | 9 (13.2) |
| Moderate | 6 (8.8) |
| Severe | 0 |
| <i>Consultation per year</i> | 5.38 |
| <i>Time spent on skin care per day</i> | |
| < 30 mins | 54 (79.4) |
| 30 - 60 mins | 7 (10.3) |
| 60 - 120 mins | 5 (7.4) |
| > 120 mins | 2 (2.9) |

Mins = minutes

disease. However, if divided by clinical staging, only 7.4% of our patients belong to the infantile group. Assuming there is an increase in incidence of AD in recent years and the early onset of the disease, we would expect a larger number of infantile dermatitis in our sample. The small number of infantile AD in our study would mean an under representation of this age group. Possible explanations could be: (1) Most infantile AD is a relative mild disease, therefore most parents do not seek for specialist advice. (2) Most of the patients will be seen by the general practitioner and only a small proportion is referred to us because of financial or management problem.

We observed a female predominance of AD in our study population and the fact that in the younger age group, the male proportion was relatively high. Some may wonder whether AD in boys is milder than that of the girls' so that the boys soon get better and defaulted. We had tried to correlate the severity rank and the

clinical outcome with different sex but we could not find any significant difference (see Table 3 and 4) .

Table 3. Correlation between patient's characteristics and severity rank

| Patient's characteristics | P value |
|--|--------------|
| Age of onset (Below 2 year, Above 2 year) | 0.63799 (NS) |
| Sex (Male, Female) | 0.88083 (NS) |
| Personal history of ARD | 0.65123 (NS) |
| Family history of ARD | 0.34511 (NS) |
| Food | 0.49369 (NS) |
| Weather | 0.35857 (NS) |
| Sweating | 0.31581 (NS) |

NS = not significant

Table 4. Correlation between patient's characteristics and outcome

| Patient's characteristics | P value |
|--|--------------|
| Age of onset (Below 2 year, Above 2 year) | 0.07670 (NS) |
| Sex (Male, Female) | 0.83913 (NS) |
| Personal history of ARD | 0.95163 (NS) |
| Family history of ARD | 0.50282 (NS) |
| Food | 0.18591 (NS) |
| Weather | 0.55785 (NS) |
| Sweating | 0.32447 (NS) |
| Outcome of ARD | -0.022 (S) |

NS = not significant, S = significant

More than 95% of cases had their age of onset below 5 and 63.2% below one year of age which was comparable to that observed by Hanifin.⁷

In this survey 58.8% of patients had personal history of atopic respiratory disease, 67.6% have family history of atopic respiratory disease, while 19.1% (n=13) have neither personal nor family history of atopic respiratory disease. The characteristics of latter group, such as mean age, sex ratio, mean age of onset, symptom and severity rank, clinical course and outcome, triggering factors and *Staphylococcus aureus* carriage rate did not differ from those that had either a personal or family history of ARD.

Staphylococcus aureus is not part of the normal flora of human skin, yet it has been frequently isolated from eczematous and non-eczematous lesion of AD. Hence some investigators had suggested an etiology relationship between *Staphylococcus aureus* colonization and primary infection in AD. Nonetheless,

the exact role played by *Staphylococcus aureus* is unclear and whether the colonization is of primary importance or a secondary phenomenon remained to be confirmed. In his study, Masenga found that more than 60% of patients' skin and 56% of their nasal mucosa was colonized by *Staphylococcus aureus*, whereas in healthy control it was only isolated in 3% and 11% respectively.¹³ In our study, *Staphylococcus aureus* was isolated from 22% of the skin specimen and 43% of nasal specimen of the patients. The lower prevalence in the skin specimen could either be due to our technical inferiority (the way specimen was collected, handled and cultured) or due to ethnic difference. Despite this difference, the role of *Staphylococcus aureus* in the triggering of skin lesions in our patients could not be ignored.

Severity

The assessment of the disease severity was based on the clinical symptom, clinical course and the clinical sign of the disease.

Among the 68 patients assessed, 13 (19.1%) had mild, 52 (76.5%) had moderate and 3 (4.4%) had severe disease at the time of interview.

When the severity of the disease was correlated with the different patient's characteristics, there was no significant correlation found in our series. (Table 3)

Triggering factors

The following are some of the important ones:

- Irritants:** woolen clothing, lipid solvents, chlorine in swimming pools, occupational irritants and smoking are irritants that will induce itchiness or exacerbate eczema.
- Aeroallergens:** the house dust mite is the most important aeroallergen being studied. Most studies come up with a positive correlation between the severity of the eczema and concentration of the house dust mite.⁸
- Microbial agents:** *Staphylococcus aureus* is believed to be one of the triggering factors of AD. They are the predominant floras in most of patients and when their concentration are reduced with topical or systemic antibiotics, there is an observed improvement of the skin lesion.⁹
- Foods:** in high risk infants (when both parents are atopic), breast feeding together with maternal

hypoallergenic diet may delay the onset of AD in infancy but the effect was not sustained when the baby grows older. In 320 selected children with moderate to severe atopic dermatitis, Sampson found that 63% of them had food hypersensitivity tested by double-blinded placebo-controlled food challenges.¹⁰ Eggs, milk, peanut, soy, wheat, fish and beef are the most commonly implicated foods.

5. **Others:** Hormones,¹¹ climatic factors,¹² stressful life events and sweating are also reported to have some influence on the activity of the disease.

In our study, 44.1% (n=30) of patients had history of food as exacerbating factor. Seafood, egg, beef, milk and fried food were the common items quoted. Sweating exacerbated AD in 76.5% (n=52) of patients. Seasonal variation of AD was also shown in our study: 45.5% of our patients had their disease better in winter and 38.6% in summer, while 15.9% of patients had their eczema worsen during a change of weather, i.e. from hot to cold or vice versa. Other factors that might adversely affect their eczema included anxiety, sun exposure, swimming in swimming pool and when they were sick.

Outcome and Prognosis

Roth et al at the Mayo clinic studied 492 patients whom they had followed up for 20 years.¹⁴ They found that patients with associated asthma or allergic rhinitis had more severe disease, and a reciprocal relationship between remission of eczema and exacerbation of associated atopic conditions. 86% of their patients were completely cleared of their eczema or got better.

Musgrove et al studied 99 patients whom they had followed up for 17 years.¹⁵ They either visited the patients or saw them in the outpatient clinic. The patients were roughly classified into severe, fairly severe, moderate severe or mild group. They found that patients with history of asthma had more severe skin disease and those with more severe disease had a more persistent course. In addition, those with a family history of eczema had worse prognosis while the age of onset had no bearing on prognosis.

More recently, Vickers held a prospective study of 2000 children whom they had followed up for 5 to 20 years.¹⁶ They found that late onset of disease and reverse pattern of eczema were adverse prognostic factors whereas early onset, seborrheic pattern and a male sex were favorable prognostic factors.

In our study 64.7% of our patients had improvement in their disease, which was compatible with those observed by Roth (86%). Correlation between the outcome (Improved, Not improved) and the following variables were made with Chi Square test: age of onset, sex, history of atopic disease, severity and triggering factors. The results were shown in Table IV. A significant inverse correlation was found between the outcome of AD and the outcome of ARD while all the other characteristics were insignificant.

Family impact

As most of our patients suffered from moderate (76 %) to severe (4.4%) atopic dermatitis, the low family impact of the disease was rather unexpected. This incongruity could mean a lack of devotion on the part of caretakers in the management of their children's skin problem. This may be a consequence of the socio-economic status of the study population. Tuen Mun is a newly developed satellite town in the New Territories. It's population composes mainly of new immigrants from mainland China or those from old urban areas undergoing reconstruction. These usually belong to the low-income groups. In some families, both parents need to work, and cannot afford the time and attention needed in the management of their children's skin problem. While in other families, they just cannot afford the money to consult private doctors.

CONCLUSION

In our study, the follow up period was short; most of our patients were only followed up for a few years although we had seen one patient regularly for 10 years. A sample size of 68 patients was comparatively small. Despite these drawbacks, we had a well-defined population using the U.K. Working Party criteria.

We also adopted a scientific approach to classify our patients into mild, moderate and severe disease. Through this survey, we found that the characteristics of local AD were similar to that of the Western population. However, neither the outcome of AD nor the clinical severity of the disease was found to be correlated with the age of onset in our survey as suggested by other study.¹⁶ A larger sample size would probably give us more information on these two aspects. The inverse relationship between the outcome of AD

and associated respiratory disease found in this study need to be further confirmed in future study.

Regarding the disease's impact on a family at large, we found that the parents did not consider the need to spend much extra time and money for the patients. However, the social cost spent by the government had not been estimated here. Therefore the social impact of this disease might have been underestimated.

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Appendix I

Questions asked concerning the family impact:

1. Are your daily work affected in looking after the patient?
2. The average number of hours you need to attend your child's skin per day e.g. bathing, application of emollient and topical steroid.
3. The number of medical consultation in the last year regarding the child's skin condition.
4. Loss of attention to other family members.

Appendix II

The newly proposed diagnostic guidelines of atopic eczema

Must have:

An *itchy* skin condition (or parental report of scratching or rubbing in a child)

Plus 3 or more of the followings

1. History of involvement of the skin creases such as folds of elbows, behind the knees, fronts of ankles or around the neck (including cheeks in children under 10).
2. A personal history of asthma or hay fever (or history of atopic disease in the first-degree relative in children under 4).
3. A history of a general dry skin in the last year.
4. Visible flexural eczema (or eczema involving the cheek/forehead and outer limbs in children under 4).
5. Onset under the age of 2 (not used if child is under 4)