

Patch test practices and perceptions of Chinese dermatologists: results of a cross-sectional survey

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Summary

Background. Patch testing is the most valuable tool for diagnosing allergic contact dermatitis. Whereas previous surveys have evaluated patch test practices and perceptions of dermatologists worldwide, no such information is available relating to Chinese dermatologists.

Objectives. We surveyed Chinese dermatologists by using questionnaires to investigate their patch test practices and the prevalence of patch testing.

Methods. A cross-sectional survey of Chinese dermatologists was conducted at the National Congress of Dermatology in December 2006.

Results. Of the 1116 questionnaires distributed, 1089 (97.6%) were returned. Eighty-six per cent of dermatologists reported performing patch testing. Dermatologists from regional hospitals were significantly more likely to perform patch testing ($p < 0.001$). The majority (80.8%) used the baseline (standard) allergen series made in China. Eighty-seven per cent of testers performed only a single patch test reading. The dermatologists' perceptions of the patch test indicated that 43.1% of the respondents thought that patch testing could be used to diagnose irritant contact dermatitis, and only 30.3% of the respondents made the correct choice when asked to read a patch test reaction.

Conclusions. Patch testing is widespread among Chinese dermatologists, but further improvement and education regarding the procedure is required.

Key words: China; contact dermatitis; patch testing; questionnaire; survey.

Contact dermatitis is a common skin disease that accounts for 6–10% of all visits to dermatology clinics (1). There are two types of contact dermatitis: allergic contact dermatitis and irritant contact dermatitis. Although allergic contact dermatitis is less common than irritant contact dermatitis, it is associated with considerable morbidity. The clinical findings of the two categories can be very similar, and differentiation between the two is often difficult for dermatologists and allergists.

The patch test is the gold standard for the diagnosis of contact allergies, and it has been available for over 100 years. Despite the fact that patch testing is relatively easy to perform, many dermatologists do not offer patch testing at all, or only offer testing for a limited number of allergens (2). In the United States, the American Academy of Dermatology sponsored a survey on the use of patch testing in 1990 (3), and several surveys were conducted during the following 20 years, but there are currently no data on the use of patch testing in China.

To date, there is no national standard method or allergen series used to perform patch testing in China. We conducted a search for all Chinese-language publications in the China National Knowledge Infrastructure (CNKI) database (4) from 1977 to August 2008 on the use of patch testing in the diagnosis of contact allergy; we identified 167 journal articles. In our evaluation of the articles,

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we found that some dermatologists in China misunderstood the patch test procedure and its purpose. In the literature, 22.8% of patch tests were used to diagnose non-type IV hypersensitivity reactions. In addition, more than half of the papers had faults in the description of the patch test methodology. Therefore, to examine the prevalence and practice of patch testing by dermatologists in China, we conducted a cross-sectional survey of Chinese dermatologists.

Materials and Methods

A questionnaire was distributed to dermatologists who attended the Chinese Dermatologists Association Annual Congress on 20 December, 2006 in Shanghai. The participants completed the questionnaire on site. The questionnaire consisted of basic demographic information and 10 multiple-choice questions.

The multiple-choice questions consisted of two categories. The first category included the following questions on patch test practices and methodologies:

- Q1. Do you perform patch testing in your practice?
- Q2. Which kind of chamber do you use when you practise patch testing?
- Q3. Which kind of 'standard' series do you use when you practise patch testing?
- Q4. How long do you leave the patch on during patch testing?
- Q5. When do you perform patch test readings?

The second category included the following questions related to perceptions of patch testing:

- Q6. Which diseases could patch testing be used to diagnose?
- Q7. When is the most suitable time to perform patch testing?
- Q8. Where is the most suitable site for patch testing?
- Q9. What is the reaction of a patch test scoring ++?
- Q10. Who would read the patch test reactions?

Data were recorded on a standardized computer entry form, and statistical analysis was performed with SPSS™ 11.5 (SPSS, Chicago, IL, USA). Pearson χ^2 -tests were used to test for associations between some demographic characteristics of the respondents and patch test practices or perceptions. A significance level of 0.05 was used for all of the analyses.

Results

Respondents

We distributed 1116 questionnaires, and 1089 (97.6%) were returned completed. Of the respondents, 25.0%

Table 1. Frequency of patch testing

Frequency	No.	Percentage (n = 936)
At least once a week	458	48.9
One to three times a month	322	34.4
Less than once a month	156	16.7

were chief dermatologists, 11.5% were associate chief dermatologists, 15.6% were attending dermatologists, 4.1% were residents, 18.9% were trainees, and 24.9% were clinical technicians. The results showed that 54.6% of the respondents were working in a regional hospital, 40.7% were working in a district hospital, and 3.8% were working in a community hospital.

Patch test practices

Eighty-six per cent (936 of 1089) of respondents stated that they performed patch testing in their practice. Of those who did, 83.3% stated that they patch-tested at least once a month (Table 1).

Patch test methodologies

The majority of dermatologists who performed patch testing used chambers made in China of aluminium on adhesive tape. Approximately 27.3% of testers used Finn Chambers® or plastic chambers. Most (80.8%) testers used allergens made in China as the baseline series (termed 'standard' series in the United States). Only 12.7% of dermatologists used the thin-layer rapid use epicutaneous TRUE Test™ series or the Chemotechnique Diagnostics® series. The results indicated that 57.4% of testers left the patches on for the recommended 2 days, and 29.4% left the patches on for 1 day. The majority of testers (87.6%) performed only one patch test reading at 0.5, 24, 48 or 72 hr, or 7 days after removal (Table 2).

Perception of patch testing

The responses to the five questions (Q6–Q10) about the patch test technique are shown in Table 3.

Association with patch testing

Dermatologists from regional hospitals were significantly more likely to perform patch testing (Table 4). The perception of patch testing did not significantly vary by the grade of dermatologist (Table 5).

Discussion

The on-site survey design can avoid the response bias of mailed or electronic surveys. In mailed or electronic

Table 2. Patch testing methodologies

	No.	Percentage (n = 936)
Chambers used ^a		
Chambers made in China	584	62.4
Finn Chambers®	230	24.6
Self-made filter papers	123	13.1
Plastic chambers (I.Q.®)	25	2.7
Others	34	3.6
Baseline (standard) series used ^a		
Peking Medical University baseline (Beijing, China)	407	43.5
Nanjing Medical University baseline (BIANMIN, Kangning Medical Development Company, Nanjing, China)	349	37.3
TRUE Test™	78	8.3
Chemotechnique Diagnostics®	41	4.4
Others	82	8.8
Patch test reading schedule (after removal)		
0.5 hr only	191	20.4
24 hr only	281	30.0
48 hr only	230	24.6
72 hr only	116	12.4
7 days only	2	0.2
0.5 and 24/48 hr	19	2.0
24 and 48 hr	11	1.2
48 and 72 hr	13	1.4
More than two times	15	1.6
Others	58	6.2

^aTotal percentage may be greater than 100%, because some dermatologists chose more than one answer.

surveys, dermatologists interested in patch testing may be more motivated to complete and return the survey than those who are not interested in this subject (5, 6).

This survey demonstrates that patch testing is widely practised in China by dermatologists (86.0%). This prevalence rate is similar to the 83% of US dermatologists who reported patch testing in 2002 (5), but lower than the 100% reported by the Scottish Dermatology Society in 2000 (7). Dermatologists from district hospitals were less likely to perform patch testing, and the dermatologists from community hospitals performed the procedure at the lowest rate. These findings may be attributable to a lack of dermatology experts and fewer patients with dermatosis at community hospitals in China.

There are currently no nationally agreed baseline allergen series in China. In this survey, 80.8% of the testers used one of two kinds of baseline series made in China. The Peking Medical University baseline series contains 26 allergens, and has been widely used in China. It is most similar to the 'standard' series of the North American Contact Dermatitis Group (NACDG) (8, 9). The Nanjing Medical University baseline series contains 20 allergens,

Table 3. Perception of patch testing

Answers to questions	No.	Percentage (n = 1089)
Q6 ^a		
Allergic dermatosis	792	72.7
Chronic eczema of uncertain cause	559	51.3
Irritant contact dermatitis	469	43.1
Allergic contact dermatitis	668	61.3
Q7		
Acute stage	116	10.7
Chronic stage	139	12.8
Immediately after lesions resolved	83	7.6
Two weeks after lesions resolved	628	57.7
Others	123	11.3
Q8 ^a		
Upper back	685	62.9
Flexor aspect of forearms	300	27.5
Flexor aspect of upper arms	93	8.5
Extensor aspect of upper arms	41	3.8
Q9		
Erythema, infiltration, possibly papules	565	51.9
Erythema, infiltration, papules, vesicles	330	30.3
Erythema, infiltration	64	5.9
Erythema, infiltration, vesicle, bullous	42	3.9
Others	88	8.1
Q10		
Nurse	26	2.4
Dermatologist	390	35.8
Trained medical researcher	53	4.9
Trained dermatologist	543	49.9
Others	77	7.1

^aTotal percentage may be greater than 100%, because some dermatologists chose more than one answer.

Table 4. Associations of hospital level and patch test practice

	Hospital level		
	Regional hospital (%)	District hospital (%)	Community hospital (%)
Patch test	534 (89.7)	359 (81.0)	33 (80.5)
Do not patch test	61 (10.3)	84 (19.0)	8 (19.5)
n = 1079 ^a	$\chi^2 = 16.83$, d.f. = 2, $p < 0.001$		

Data were analysed with the Pearson χ^2 -test with two degrees of freedom (d.f.).

^aTotal number was less than 1089, because 10 respondents did not provide information about the hospital level.

selected from the series of the International Contact Dermatitis Research Group, which was reported to be suitable for use in routine clinical practice in China (10). In fact, the baseline series used by dermatologists varies from country to country, region to region, and practitioner to practitioner (11). The 'standard' series most frequently used by American Contact Dermatitis Society members is a modified NACDG series (12),

Table 5. Association of grade of dermatologist and patch test perception

Patch test perception	Grade of dermatologist					
	Chief dermatologist (%)	Associate chief dermatologist (%)	Attending dermatologist (%)	Resident (%)	Trainee (%)	Technician (%)
Diseases to diagnose						
ICD	117 (43.0)	60 (48.0)	63 (37.1)	20 (44.4)	92 (44.7)	117 (43.2)
Not ICD	155 (57.0)	65 (52.0)	107 (62.9)	25 (55.6)	114 (55.3)	154 (56.9)
n = 1089			$\chi^2 = 3.99$, d.f. = 5, $p = 0.550$			
Suitable time to perform						
Right answer	146 (53.7)	62 (49.6)	103 (60.6)	29 (64.4)	120 (58.3)	168 (62.0)
Wrong answer	126 (46.3)	63 (50.4)	67 (39.4)	16 (35.6)	86 (41.7)	103 (38.0)
n = 1089			$\chi^2 = 8.65$, d.f. = 5, $p = 0.124$			
Patch test reaction reading						
Right answer	79 (29.0)	48 (38.4)	43 (25.3)	12 (26.7)	60 (29.1)	88 (32.5)
Wrong answer	193 (71.0)	77 (61.6)	127 (74.7)	33 (73.3)	146 (70.9)	183 (67.5)
n = 1089			$\chi^2 = 7.12$, d.f. = 5, $p = 0.212$			
Staff reading reactions						
Trained dermatologist	131 (48.2)	59 (47.2)	88 (51.8)	24 (53.3)	102 (49.5)	139 (51.3)
Others	141 (51.8)	66 (52.8)	82 (48.2)	21 (46.7)	104 (50.5)	132 (48.7)
n = 1089			$\chi^2 = 1.36$, d.f. = 5, $p = 0.928$			

ICD, irritant contact dermatitis.

Data were analysed with the Pearson χ^2 -test with five degrees of freedom (d.f.).

whereas the TRUE Test™ is the most common ‘standard’ series used by US dermatologists and allergists (5, 13). Thus, the term ‘standard’ is perhaps a misnomer, because the ‘standard’ series is far from standardized.

In our study, only 8.3% of the testers used the TRUE Test™, although it is easy to apply. The reason may be that the TRUE Test™ was approved for use in China only 2 years ago, and its use is not yet widespread. Another possible reason for its low level of use is that the TRUE Test™ is approximately twice as expensive as the series produced in China.

It is discouraging that 87.6% of those who perform patch testing read tests on only one occasion. This rate is much higher than that reported in the United States, where approximately 33% of allergists and 27% of general dermatologists perform a single patch test reading (5, 13). Only 14% of those in the American Contact Dermatitis Society perform single readings (14). It is generally accepted that two readings should be performed, and a third reading on day 5 may give further positive results (15). A single day 2 reading is associated with the loss of up to one-third of positive reactions, and irritant reactions can be mistaken for allergic reactions (16, 17). Although the majority of dermatologists in China are performing patch testing, we must focus future educational efforts on the importance of performing second patch testing readings.

When we assessed the perceptions of patch testing among dermatologists in China, we found that some dermatologists did not have a comprehensive understanding

of patch testing. Forty-three per cent of the respondents thought that patch testing could be used to diagnose irritant contact dermatitis. This rate is higher than the 22.8% reported in the CNKI database obtained in our previous statistical analysis (4). This difference may be because the authors of the CNKI publications were more interested in patch testing than the respondents in this survey. Forty-two per cent of our questionnaire respondents made a wrong choice when they were asked, ‘When is the most suitable time to apply patch testing?’ Patch testing should be avoided in those with acute dermatitis, as false-positive results are possible.

In terms of reading patch test results, half of the respondents believed that a trained dermatologist should perform readings. It is surprising that only 30.3% of the respondents made a correct choice about reading the patch test. This result might be explained by the fact that most dermatologists did not perform patch testing by themselves, as specialized doctors in China perform the majority of patch tests. Another possible explanation is the lack of patch test training for dermatologists in China. Although there is a long-established trainee rotation in China, a significant number of dermatologists do not learn the patch test technique during their general dermatology rotation. Our survey did not include questions regarding patch test training, and there is a lack of accurate information in the medical literature on whether Chinese dermatologists receive formal patch test training and how they receive this training. Patch testing is relatively easy to perform,

but accurate interpretation requires experience and knowledge. As Albert Kligman said, 'Everybody can apply a patch test. Reading requires an expert' (18). Education and experience are necessary to interpret patch test readings accurately and to provide correct information for patients (19).

We found that there was no association between the grade of dermatologist and the perceptions of patch testing. The similar distribution rates suggest that dermatologists in each grade of their careers are not fully familiar with patch testing.

In conclusion, this study has shown that patch testing is performed widely by Chinese dermatologists, but further education should be provided. The findings of this survey may form the basis for future studies and education efforts.

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