

REPORT

Patients' perceptions of the usefulness and outcome of patch testing

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Background: Studies have shown the effect of allergic contact dermatitis on quality of life, but few address the impact of patch testing.

Objective: We sought to determine patient satisfaction with patch testing, patients' perceptions of its usefulness, dermatitis outcomes, and recall of allergens.

Methods: After patch testing, surveys were mailed to 1453 patients.

Results: Response rate was 52.1%, 757 surveys returned: 518 women (68.4%) and 239 men (31.6%). More than 75% (578) of respondents were at least "somewhat satisfied" with the process; 51% (388) were "very satisfied." More than half (430, 58.3%) reported improved dermatitis. The 580 patients who had positive reactions remembered a mean of 51.0% of allergens; 198 of these (34.1%) remembered 100%. Of 2547 positive reactions to allergens, 1229 (48.3%) were remembered correctly.

Limitations: Limitations were reporting bias and individual interpretations of questions.

Conclusion: Although patients reported both satisfaction with patch testing and improvement in skin conditions, they forgot more than 40% of identified allergens. Techniques are needed to improve patient recall. (J Am Acad Dermatol 10.1016/j.jaad.2006.11.034.)

Patch testing, the gold standard for diagnosing allergic contact dermatitis (ACD), is a time-consuming process that requires transmission of large amounts of information to patients, multiple patient visits, and a great deal of patient education in the avoidance of identified allergens. Because of the inconveniences involved in patch testing, patients may not be satisfied with the process, and it is unclear whether they remember all of the results of their patch tests. These points have not been extensively evaluated. Studies have addressed

patient satisfaction with patch testing and the improvement of skin conditions after testing,¹⁻¹⁵ but to our knowledge, only one study has addressed patient recall of specific allergens.⁴

In this study, we sought to determine the level of patient satisfaction with the patch-testing process, the physician, and the nurse. With the use of a survey, we also determined whether patients believed patch testing was helpful, perceived improvement in their skin conditions, thought that they were successful at avoiding allergens, and would recommend patch testing to others. In addition, we queried patients about whether they remembered which allergens they should avoid and identified which patients are more likely to recall this information.

METHODS

After the study was approved by our institutional review board, 1500 consecutive patients who had undergone patch testing at one of the Mayo Clinic sites (Jacksonville, Fla; Rochester, Minn; or Scottsdale, Ariz) were selected to receive a survey by mail. This group consisted of patients who had been tested to the standard series between December 16,

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2002, and September 30, 2004. A total of 47 patients were excluded because they were pediatric patients, were deceased, or had refused research authorization. Therefore, 1453 surveys were mailed after patch testing, from November 2004 through August 2005. If a patient did not respond to the first mailing, they were sent a second mailing of the survey 1 to 2 months later. No follow-up telephone calls were made.

Patient satisfaction questions (designed by M. D. P. D. in conjunction with the Mayo Clinic Survey Research Center) were presented in a multiple-choice manner (Table I); the final question of the survey required a narrative response. Patients were asked to recall the names of the allergens that showed positive results, if any had been identified with patch testing. The answers were compared with the database of patch-testing results for these patients. We analyzed the results and compared them by sex, age group, and profession. Descriptive statistics were calculated with a software package (SAS Institute, Cary, NC).

RESULTS

Of the 1453 surveys sent, 757 were returned (response rate 52.1%); 621 were never returned; 64 refused the Health Insurance Portability and Accountability Act form; and 11 either did not think the survey applied to them or filled out the survey but failed to sign the Health Insurance Portability and Accountability Act form. The mean time between patch testing and survey completion was 13.4 ± 6.5 months. Mean age at the time of the survey was 59.5 ± 16.0 years (range: 18.6–94.1 years); 518 respondents were women (68.4%) and 239 were men (31.6%). Patch testing was performed in Minnesota for most patients (499, 65.9%), followed by Arizona (227, 30.0%) and Florida (31, 4.1%).

The results of the survey and the patients' responses to questions concerning the process of patch testing are summarized in Tables I through III. Overall, patients were satisfied with the process of patch testing and thought that they had benefited from testing. More than 75% of the patients who responded (578) were at least "somewhat satisfied" with the overall process, with 51% (388) reporting that they were "very satisfied." More than half of the patients reported an improvement in their skin condition since patch testing.

In all, 580 patients (76.6%) had at least one positive reaction. These patients remembered a mean of 51.0% (SD 42.9%) of their identified allergens; 198 patients (34.1%) remembered 100% of the allergens to which they tested positive. For the 238 patients who tested positive to just one or

two allergens, 118 (49.6%) remembered all of them correctly. For the 342 patients who tested positive to 3 or more allergens, 80 (23.4%) remembered all of them correctly. Of the 2547 total positive reactions to allergens for the entire survey group, 1229 (48.3%) were remembered correctly. Patients aged 50 to 59 years remembered more of their allergens correctly (60.3%) than patients in all other age groups. Women recalled an average of 54.6% of their allergens correctly, whereas men correctly recalled 42.2% of their allergens. A greater percentage of nurses remembered all of their allergens correctly (52.4%) than patients in all other reported occupations.

The percentage of allergens remembered correctly decreased as the length of time between patch testing and survey completion increased (Fig 1). However, the Spearman correlation coefficient for this association was -0.05 , a very weak (ie, nonsignificant) correlation.

DISCUSSION

In this study, we found that patients were, in general, satisfied with the patch-testing process, that their skin improved after patch testing, and that they could recall more than 50% of allergens identified during the patch-testing process.

It was interesting that patients were so satisfied with the process of patch testing, because it is a time-consuming (5 days) and labor-intensive process. We were pleased that more than three fourths of the patients who responded to our survey were at least "somewhat satisfied" with the overall process and just more than half responded that they were "very satisfied." In addition, patients reported satisfaction with both the physician and nursing staff.

The patients reported that their skin improved after patch testing; this may be attributable to many factors, among which may have been allergen avoidance. ACD can be a frustrating problem for patients, and in clinical practice, allergen avoidance often seems quite difficult for patients. However, most of our patients perceived that patch testing was of benefit in treating their skin condition.

Other studies have also shown that patch testing leads to an improvement in dermatitis.⁶ A study by Woo et al¹ showed clearing of the skin condition in approximately half of patients with contact dermatitis, and another study⁴ demonstrated improvement in approximately 40% of patients. A retrospective review of 270 patients with ACD indicated that diagnosis of ACD by patch testing was associated with a larger decrease in the disease severity index and percentage of disease activity than was a diagnosis of ACD without patch testing.⁷

Table I. Results of patch-testing survey for the 757 respondents

Question	No. of patients (%)
1. Satisfaction with the patch-testing process (<i>n</i> = 754)	
Very satisfied	388 (51.5)
Somewhat satisfied	190 (25.2)
Neutral	107 (14.2)
Somewhat dissatisfied	41 (5.4)
Very dissatisfied	28 (3.7)
2. Satisfaction with the doctor (<i>n</i> = 756)	
Very satisfied	514 (68.0)
Somewhat satisfied	130 (17.2)
Neutral	58 (7.7)
Somewhat dissatisfied	32 (4.2)
Very dissatisfied	22 (2.9)
3. Satisfaction with the nurse (<i>n</i> = 755)	
Very satisfied	597 (79.1)
Somewhat satisfied	95 (12.6)
Neutral	48 (6.4)
Somewhat dissatisfied	7 (0.9)
Very dissatisfied	8 (1.1)
4. Helpfulness of patch testing (<i>n</i> = 748)	
Very helpful	278 (37.2)
Somewhat helpful	293 (39.2)
Not at all helpful	177 (23.7)
5. Skin condition since test (<i>n</i> = 738)	
Much better	237 (32.1)
Somewhat better	193 (26.2)
About the same	260 (35.2)
Somewhat worse	34 (4.6)
Much worse	14 (1.9)
6. Success at avoiding allergens (<i>n</i> = 646)	
Very successful	283 (43.8)
Somewhat successful	280 (43.3)
Not at all successful	83 (12.8)
7. Lifestyle changes made to avoid allergens? (<i>n</i> = 731)	
Yes	352 (48.2)
No	174 (23.8)
Not applicable	205 (28.0)
8. Changed jobs to avoid allergens? (<i>n</i> = 730)	
Yes	17 (2.3)
No	414 (56.7)
Not applicable	299 (41.0)
9. How were results received? (<i>n</i> = 743)	
Follow-up visit with physician	608 (81.8)
Telephone call from physician	17 (2.3)
Visit with a nurse	91 (12.2)
Mail	27 (3.6)
10. Satisfaction with explanation of results (<i>n</i> = 749)	
Very satisfied	410 (54.7)
Somewhat satisfied	194 (25.9)
Neutral	79 (10.5)
Somewhat dissatisfied	37 (4.9)
Very dissatisfied	29 (3.9)

Table I. Cont'd

Question	No. of patients (%)
11. Were all questions/concerns answered? (<i>n</i> = 739)	
Yes	621 (84.0)
No	118 (16.0)
12. Received printed guidelines to help avoid allergen? (<i>n</i> = 711)	
Yes	547 (76.9)*
No	119 (16.7)
Do not know	45 (6.3)
13. Allergic to chemicals in skin-care products? (<i>n</i> = 731)	
Yes	390 (53.4) [†]
No	341 (46.6)
14. Would you recommend patch testing to friend/relative? (<i>n</i> = 747)	
Definitely would recommend	345 (46.2)
Probably would recommend	233 (31.2)
Neutral	117 (15.7)
Probably would not recommend	37 (5.0)
Definitely would not recommend	15 (2.0)
15. Would you recommend patch testing at Mayo to friend/relative? (<i>n</i> = 750)	
Definitely would recommend	400 (53.3)
Probably would recommend	190 (25.3)
Neutral	112 (14.9)
Probably would not recommend	33 (4.4)
Definitely would not recommend	15 (2.0)
16. Tested because of workers' compensation? (<i>n</i> = 751)	
Yes	10 (1.3)
No	741 (98.7)
17. Financial impact of patch testing (<i>n</i> = 736)	
Paid out of pocket	54 (7.3)
Insurance paid completely	317 (43.1)
Insurance paid for part	365 (49.6)
18. Do you remember allergens identified by testing? (<i>n</i> = 587)	
Yes	438 (74.6)
No	149 (25.4)

No. of patients responding to each question varied, as indicated.

*See Table II for subset that answered "yes" to question 12.

[†]See Table III for subset that answered "yes" to question 13.

Some clinicians may think that patients are not generally successful at avoiding allergens. However, the patient perception of success in allergen avoidance in our survey was quite high. Almost 90% of our patients reported that they were at least somewhat successful in avoiding their allergens, and just under half thought that they had been "very successful." A similar result was found by Thomson et al⁹—89% of patients given the diagnosis of ACD were successful in avoidance of allergens. Lewis et al⁴ showed that

Table II. Results of patch-testing survey: 547 who answered "yes" to question 12, "Received printed guidelines to help avoid allergen?"

Question	No. of patients (%)
Read printed material?	
Yes	541 (98.9)
No	6 (1.1)
Clearness of information in printed material (<i>n</i> = 538)	
Very clear	377 (70.1)
Somewhat clear	150 (27.9)
Not at all clear	11 (2.0)

Table III. Results of patch-testing survey: 390 who answered "yes" to question 13, "Allergic to chemicals in skin-care products?"

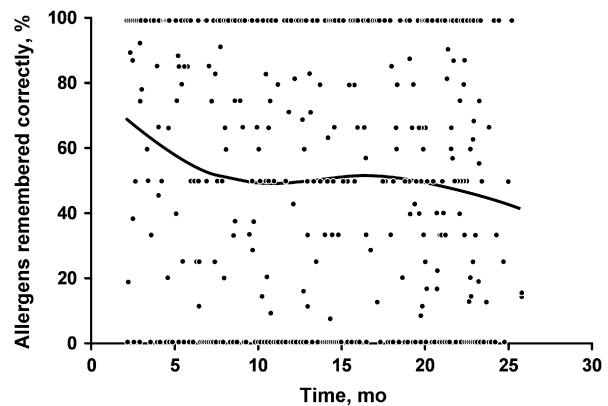
Question	No. of patients (%)
Only use skin-care products recommended by dermatologist? (<i>n</i> = 385)	
Yes	292 (75.8)
No	93 (24.2)
How often do you read labels of skin-care products? (<i>n</i> = 386)	
Always	278 (72.0)
Sometimes	88 (22.8)
Rarely	17 (4.4)
Never	3 (0.8)

No. of patients responding to each question varied, as indicated.

half of patients believed that they were able to avoid allergens.

We had postulated that, with the large volume of technical information communicated to the patients after patch testing, they would have difficulty recalling specific identified allergens. The survey results indicated that they could recall many of the allergens. However, on average, 50% of the identified allergens were not recalled. Not unexpectedly, the more time that had passed since patch testing, the less the patient recalled, although this was a very weak correlation.

In the education of our patients about the allergens to which they tested positive, several measures are taken. First, results are discussed with patients, and potential relevance is discussed at the completion of patch testing. More than 80% of the patients reported that they did receive their results during a follow-up visit with the physician and indicated that the results were explained adequately to them. Second, written sheets describing how to avoid the allergens are given to the patients. Patients indicated that they thought this written material was clear; most patients who did not receive written material

**Fig 1.** Percentage of positive allergens remembered by each patient in relation to time from patch test to day survey was completed. Spearman correlation coefficient -0.05 .

had negative patch-testing results. Third, the contact allergen avoidance database is given to patients; this gives them a list of skin-care products they are permitted to use, given their identified allergens. It is possible that more education than these 3 measures is needed.

Our study did not directly compare modes of transmitting information to the patient. However, Woo et al¹ studied patients' perceived understanding of written versus verbal information. They found that patients understood verbal better than written information. A study by Kist et al¹⁶ documented the efficacy of a written shopping list for patients who have skin-care product ingredient allergies. Each patient's shopping list was generated using the contact allergen avoidance database, which is updated quarterly with the ingredients of more than 2000 commercially available skin-care products.¹⁶

Patients seemed generally more satisfied with patch testing if allergens were identified with the patch testing. Of the patients in our study who thought that patch testing was not helpful, approximately 41% had negative patch-testing results. Woo et al¹ showed similar but more dramatic findings: 90% of patients with positive patch-testing results thought that patch testing had been helpful, whereas just more than half of those with negative results thought that the testing had been helpful for their skin condition.

Lifestyle changes were made more commonly in response to the patch-testing results than were changes in jobs. Almost half of patients reported making lifestyle changes, but just more than 2% had actually changed jobs to avoid allergens. We recognize, however, that because of individual interpretation of the question, this result may not account for

patients whose duties had been reassigned by their current employer. The study by Woo et al¹ showed that 6 weeks after patch testing, just more than 90% of those with ACD had changed their lifestyle to avoid allergens, whereas only about half of the patients in the study by Lewis et al⁴ reported lifestyle changes. Kadyk et al¹⁷ reported that patients who elected to change jobs because of their skin condition indicated significantly worse quality of life than did those who stayed in their current positions.

LIMITATIONS

Our study had limitations as seen with any survey, such as reporting bias; patients who are very pleased or very angry may be more likely to respond. In addition, patients may interpret the questions in many ways. However, our survey is strengthened by the large number of respondents (757 patients, 52%), all of who had had a uniform experience of patch testing during a defined time period (almost 2 years). A further limitation of this study was that it was not pretested. It also did not address which allergens the patient was more likely to remember. For example, it is possible that they recall common allergens or allergens that are relevant to their skin condition but forget the other allergens. This survey was not designed to answer this question, which would be a legitimate question for future studies. In addition, these results may not represent patient satisfaction with patch testing to smaller series such as the TRUE test (Allerderm, Phoenix, Ariz). Smaller series may miss relevant allergens and may diminish patient satisfaction.

CONCLUSION

Our study supports previous reports that patch testing is perceived by patients as a valuable tool that positively affects their dermatitis. However, this study also illustrates that many identified allergens are forgotten by patients after patch testing.

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