

CLINICAL LETTER

Allergy immunotherapy from the patient's perspective

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INTRODUCTION

Allergic rhinitis is a growing problem, carrying a significant negative impact on quality of life for many. Despite multiple available treatment strategies, allergen specific immunotherapy (IT) is the only potentially curative treatment with improvements in quality of life while decreasing patient financial burden.^{1–3} IT involves exposure of allergen peptides to the immune system in a controlled manner over a period of 3–5 years. Advances in this treatment have led to a variety of safe and effective delivery routes including subcutaneous (SCIT), sublingual (SLIT, using one region of the oral cavity), oral mucosal (OMIT, using multiple regions of the oral cavity), epicutaneous (EPIT), and intralymphatic (ILIT).

While studies have compared patient preference in IT delivery modality and impact on quality of life improvement, little has been done to ascertain patient satisfaction with IT stratified by delivery method.^{2,4,5} In this study, we surveyed patients who received SCIT, SLIT or OMIT, and assessed their level of satisfaction in order to better advise future patients and identify unmet needs in delivering quality allergy care.

METHODS

A one-time, real world survey assessing patient satisfaction was administered to adult patients at our insti-

tution who were prescribed allergy IT via their chosen delivery method (either SCIT, SLIT using liquid drops, or OMIT using a specially-designed toothpaste delivery system) between January 2014 and December 2019. Participant demographic and medical information were collected by chart review. Household income was estimated using US Census information.⁶ This study was approved by the Weill Cornell Medical College Institutional Review Board, New York, NY, USA (#20-03021693). Descriptive statistics were used to characterize the study sample. Where appropriate, the chi-square test (or Fisher's exact test), the Kruskal-Wallis test, and unadjusted logistic regression were used to examine associations between delivery method and demographic/clinical factors of interest. All analyses were performed in R Version 4.0.2 (R Foundation for Statistical Computing, Vienna, Austria).

RESULTS

Of the 493 surveys sent, 89 responses were received (participation rate of 18.1%) (Table 1). The median age of participants was 43 and 57% were female. Forty-five percent of participants completed a full course of IT. Thirty (33%) received SCIT, 38 (43%) received SLIT, and 21 (24%) received OMIT. Median household income was observed to be significantly different between the groups, with the SLIT and OMIT cohorts having the highest median income ($p = 0.007$).

TABLE 1 Survey respondent demographics (n = 89)

Characteristic	Overall (n = 89)	Delivery modality			p-value
		SCIT (n = 30)	SLIT (n = 38)	OMIT (n = 21)	
Age, median (IQR)	43 (32, 54)	40 (33, 53)	43 (32, 56)	44 (32, 50)	0.68
Females, no. (%)	51 (57)	20 (67)	24 (63)	7 (33)	0.038
Median income, median (IQR)	99643 (74411, 124988)	85103 (60659, 104808)	104784 (91846, 122969)	122169 (81228, 132605)	0.007
History of asthma, no. (%)	22 (25)	8 (27)	8 (21)	6 (29)	0.78
History of tobacco use, no. (%)	15 (17)	7 (23)	6 (16)	2 (9.5)	0.45
>3 month gap in IT, no. (%)	15 (17)	10 (33)	5 (13)	0 (0)	0.005
Completed full IT course, no. (%)	40 (45)	10 (33)	23 (61)	7 (33)	0.039

Note: All p-values calculated from Kruskal-Wallis test or Fisher's exact test. Significant at $p < 0.05$.

Abbreviations: IQR, interquartile range; IT, immunotherapy; SCIT, subcutaneous IT; SLIT, sublingual IT; OMIT, oral mucosal IT.

The majority of participants found allergy IT to be extremely or very helpful (67%) (Table 2). A majority of study participants (81%) indicated that they would recommend IT to another. With IT, respondents reported fewer symptoms (75%), less medication use (63%), and quality of life improvement (56%). Most reported first symptom improvement between 6 and 12 months (56%). A third of responders indicated that they had stopped allergy IT treatment early, most commonly citing inconvenience. Comparing delivery modalities, the odds of recommending IT to others did not significantly differ by delivery route (SLIT to SCIT: OR = 1.94, 95%CI: 0.59, 6.65; OMIT to SCIT: OR = 2.18, 95% CI: 0.54,11.1).

DISCUSSION

The results of this single-center survey are, to our knowledge, the first to compare patient satisfaction on IT by the delivery route. Our findings indicate that a majority of patients were highly satisfied and willing to recommend IT to others, independent of delivery method. This highlights the importance of offering multiple choices to patients to limit attrition. From our findings, patients can have confidence that they can obtain satisfactory outcomes through their preferred delivery method.

Our analysis found a significantly increased adherence to IT therapy in the OMIT cohort as compared to the SLIT and SCIT groups. This is likely attributed to OMIT's integration in a patient's daily routine through tooth brushing. Similarly, we found that SCIT had a significantly lower median income compared to the other cohorts. This observation can be attributed to the out-of-pocket cost of SLIT and OMIT therapy, while SCIT almost always has at least partial insurance coverage.

Limitations of our study include recall bias, response rate from mailed surveys and the inclusion of adults only. Future studies must examine the impact of method choice on the success and satisfaction from allergy IT, from the perspective of both the child as well as their family. Despite these factors, we believe our results are valuable to report and can reassure physicians and patients that OMIT, SLIT and SCIT all result in a high level of satisfaction.

CONCLUSION

Our survey-based study reveals that most patients find allergy IT to be helpful and would recommend it to others. Notably, route of delivery (SLIT vs. SCIT vs. OMIT) does not significantly affect overall patient satisfaction.

TABLE 2 Survey responses ($n = 89$)

Characteristic	Overall (<i>n</i> = 89)	Delivery modality			<i>p</i> -value
		SCIT (<i>n</i> = 30)	SLIT (<i>n</i> = 38)	OMIT (<i>n</i> = 21)	
Question 1: Helpfulness of allergy IT, no. (%)					0.035
Extremely or very helpful	60 (67)	22 (73)	24 (63)	14 (67)	
Somewhat helpful	16 (18)	2 (6.7)	7 (18)	7 (33)	
Not helpful	13 (15)	6 (20)	7 (18)	0 (0)	
Question 2: Benefits noticed from allergy IT, no. (%)					0.16
Less symptoms	67 (75)	22 (73)	26 (68)	19 (90)	0.16
Less medication use	56 (63)	19 (63)	22 (58)	15 (71)	0.62
Quality of life improvement	14 (16)	6 (20)	7 (18)	1 (4.8)	0.32
Better control of other medical problems	50 (56)	15 (50)	22 (58)	13 (62)	0.70
No benefits observed	11 (12)	4 (13)	7 (18)	0 (0)	0.094
Question 3: Time to first noticed improvement, no. (%)					0.038
0–3 months	5 (5.6)	3 (10)	0 (0)	2 (9.5)	
3–6 months	19 (21)	8 (27)	10 (26)	1 (4.8)	
6–9 months	25 (28)	10 (33)	9 (24)	6 (29)	
9–12 months	25 (28)	4 (13)	11 (29)	10 (48)	
No improvements yet	13 (15)	5 (17)	7 (18)	1 (4.8)	
Unsure	2 (2.2)	0 (0)	1 (2.6)	1 (4.8)	
Question 4: Would recommend allergy IT to others, no. (%)					0.53
Question 5: Reason for stopping IT treatment early, no. (%)					0.065
Inconvenience	11 (12)	7 (23)	1 (2.6)	3 (14)	
Cost	2 (2.2)	1 (3.3)	1 (2.6)	0 (0)	
Side effects/discomfort	4 (4.5)	2 (6.7)	1 (2.6)	1 (4.8)	
Not enough improvement	5 (5.6)	3 (10)	2 (5.3)	0 (0)	
Other	3 (3.4)	2 (6.7)	0 (0)	1 (4.8)	
More than one main reason	4 (4.5)	1 (3.3)	3 (7.9)	0 (0)	
No response	60 (67)	14 (47)	30 (79)	16 (76)	

Note: All *p*-values calculated from Fisher's exact test. Significant at $p < 0.05$.

Abbreviations: IT, immunotherapy; SCIT, subcutaneous IT; SLIT, sublingual IT; OMIT, oral mucosal IT.

CONFLICT OF INTERESTS

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AUTHOR CONTRIBUTIONS

The project idea and study design were conceptualized by William R. Reisacher and Malombe Toure. Data collection was performed by Sarita S. Ballakur while data analysis was performed by Anjile An and Sarita S. Ballakur. Manuscript preparation was performed by Sarita S. Ballakur and William R. Reisacher, with manuscript editing being performed by all authors.

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