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TITLE PAGE

Title: Health care professionals' beliefs and practices regarding food allergy testing for children with eczema

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RESEARCH LETTER

To the Editor,

Atopic dermatitis/eczema (hereafter 'eczema') affects around 20% of children in the UK and symptoms can be difficult to manage.¹ Parents of children with eczema often request food allergy tests or exclude foods from their diets to manage the symptoms.² Whilst it is understood that early-onset eczema is associated with food allergy and allergic reactions to foods can exacerbate eczema symptoms,³ evidence that foods cause long-term eczema symptoms is weak.⁴ Current guidance advises only to suspect food allergy if the child has immediate symptoms or the eczema is difficult to treat.⁵ Overall, there is uncertainty amongst health care professionals (HCPs) regarding the value of food allergy testing of children with eczema. We sought to investigate HCPs' beliefs and practices regarding food allergy tests (blood specific IgE and skin prick) for children with eczema, by completion of an online survey.

Ethical approval was granted from the University of Bristol Research Ethics Committee (ref 105442).. A short survey was compiled by the research team, consisting of fixed, multiple-choice style questions and one optional free text question, at the end of the survey, which invited respondents to explain their responses. Participants were given information on the first page of the survey to read before deciding whether to take part or not. Consent was implied when participants clicked past the first page and answer the questions on page two .HCPs who diagnose and treat children with eczema were invited, via professional networks and social media, to participate anonymously via a GDPR compliant survey host (www.onlinesurveys.ac.uk). The survey was open for four weeks, June-July 2020. Quantitative data were analysed using Stata v15 and the chi-square test was used to compare all four levels of response across all four HCP specialties. Formal analysis of free text responses was not performed, but instead responses were grouped under broad themes and quotes selected to illustrate the views of some respondents.

Of the 155 HCPs who completed the survey, 17 were not UK based and 9 were not able to request allergy tests in their role. We therefore report on the 129 (83%) respondents who were based in the UK and able to request food allergy tests as part of their clinical practice. This group comprised physicians (n=113, 88%), nurses (n=13, 10%) and dieticians (n=3, 2%); across the four specialties of General Practice (GP; n=65, 50%), paediatrics (n=30, 23%), allergy (n=22, 17%) and dermatology (n=12, 9%). Most worked in publicly funded healthcare settings (n=124, 96.1%). Health care professionals in dermatology (mean=12.0, SD=8.0) and allergy (mean=11.3, SD=9.2) reported seeing more children with eczema per week than

respondents working in paediatrics (mean=5.6, SD=5.4) and GP (mean=2.4, SD=1.8) (ANOVA p-value<0.001).

First, HCPs were asked about the use of food allergy tests for children with eczema, with or without a clinical history of allergic reaction to food (see figure 1 and table S1). For children with eczema and a history of immediate reaction, more HCPs in allergy (91%) and paediatrics (73%) *always* requested a test, compared to GP (25%) and dermatology (25%) (p<0.001). For children with no history of reaction, most HCPs in GP (88%), paediatrics (53%) and dermatology (58%) *never* requested a test but most HCPs in allergy (77%) requested a test *sometimes* or more often (p<0.001). For children with a history of delayed reaction, HCPs across all specialties, allergy (82%), GP (76%), paediatrics (73%), dermatology (75%) requested a test *sometimes* or more often (p=0.583). For children with a mixed picture of immediate and delayed reactions, rates of testing were higher among HCPs in allergy (91% *always or mostly*) and paediatrics (90%) compared with dermatology (50%) and GP (31%) (p<0.001).

Next, HCPs were asked about the use of food allergy tests for children with different severities of eczema when there is no history of a clinical reaction to food (figure 2 and table S2). Allergy HCPs were more likely than other HCPs to test for food allergy in children with clear eczema (82% *never* compared with 97-100%, p<0.017). HCPs in allergy and paediatrics used food allergy tests more often than HCPs in GP or dermatology for children with mild (*never*: allergy 59% and paediatric 76%, vs dermatology 82% and GP 98%; p<0.001), moderate (*always or mostly*: allergy 27% and paediatrics 10% vs dermatology 0% and GP 3.1%; p=0.006), severe (*always or mostly*: allergy 45% and paediatrics 40% vs dermatology 33% and GP 14%; p=0.001) and very severe (*always or mostly*: allergy 45% and paediatrics 53% vs dermatology 42% and GP 25%; p=0.010) eczema.

Finally, HCPs were asked about the use of food allergy tests in cases of faltering growth, parent requests, early onset eczema, difficult to treat eczema and family history of atopy. Regarding faltering growth, many HCPs *never* requested a food allergy test in GP (60%), paediatrics (43%) and dermatology (42%), whereas most HCPs in allergy did *sometimes* or more often (67%) (p=0.048). There was no difference between specialties when considering parent requests in the decision to request an allergy test (*sometimes* or *never* GP 95%, paediatrics 90%, allergy 90% and dermatology 92%; p=0.825). In cases of early onset eczema, most HCPs in GP (63%) *never* requested allergy tests compared with only 5% of HCPs in allergy, 33% in dermatology, and 27% in paediatrics (p<0.001). *Sometimes* was the favoured response across all four specialties in cases of difficult to treat eczema. Family history of atopy *never* influenced most HCPs in GP (54%) or dermatology (67%) to request an allergy test, whereas for most HCPs in paediatrics (63%) and allergy (81%) reported this influenced them *sometimes* or more often (p=0.070).

There were 68 responses to the final open-ended question: 19 from HCPs in Allergy, 6 from Dermatology, 33 from GP and 10 from Paediatrics. Lack of confidence in requesting and interpreting the tests was a common theme amongst HCPs in GP. Other themes across all specialties included: only testing children with eczema if they have other symptoms as well; concerns regarding the high risk of false positives in children with eczema; the value of testing children with eczema to relieve parental concerns and to assess tolerance after periods of exclusion. The issue of parent request was also commented on most commonly by HCPs in GP:

"I am not confident in knowing when allergy tests will be helpful. If a child has severe eczema or isn't responding to treatment then I might think of it but would probably refer to a dermatologist for advice. I might request it if a parent asked for it."

"I try to avoid it. Difficult to interpret, but there is mounting parental pressure fuelled by the media to do these kinds of tests."

"I rarely request these tests but parents ask for them a lot."

To our knowledge, this is the first study to evaluate HCPs' beliefs and practices regarding food allergy testing and eczema. We found opinions varied by scenario and speciality, with HCPs in allergy and paediatrics more likely overall to request a food allergy test than HCPs in GP or dermatology; and HCPs in allergy and paediatrics varying their practice more than the other groups according to the clinical scenario. The online survey allowed us to reach health care professionals across the UK, but our findings are limited by the number of, and manner by which, the sample were recruited: half of the sample comprised clinicians working in GP and respondents may not be representative of other HCPs from their speciality. We also acknowledge that what people report and what they do may differ and may be influenced by access to, and confidence in interpreting allergy tests.

"I find food allergies really tricky and would like more training in this. One barrier to requesting the test is I'm not sure how to interpret the result."

(HCP in General Practice)

Furthermore, the survey was conducted in the middle of the Covid-19 pandemic, which may have influenced referral decisions.

“I don't feel qualified to request these tests appropriately or interpret the results so would (pre-covid) refer on if this was a possibility. Now I would only request them on the advice of secondary care.” (HCP in General Practice)

The disparities in practice described by this survey may reflect the lack of knowledge of current guidance on food allergy testing in children with eczema and/or the questions about the evidence that underpins the guidelines. The disparities we describe are likely to cause increased costs to the NHS, with potential long-term consequences for children in terms of nutrition, potential loss of tolerance and/or potential for significant immediate type reactions. Future research should focus on strengthening the evidence on the role of food allergy tests and dietary exclusions in guiding decision making for children with eczema and exploring how evidence-based guidance can be effectively disseminated amongst HCPs.

Authorship: MJR conceived and led on the study; AG designed the online version of the survey and led on the analysis; RJB & SM helped with the overall study design, delivery, and interpretation of the findings. AG wrote the first draft of the research letter with assistance from MJR and input from RB & SM. All authors reviewed, commented, and approved the final manuscript.

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Data availability: Requests for data will be considered by the corresponding author.

REFERENCES

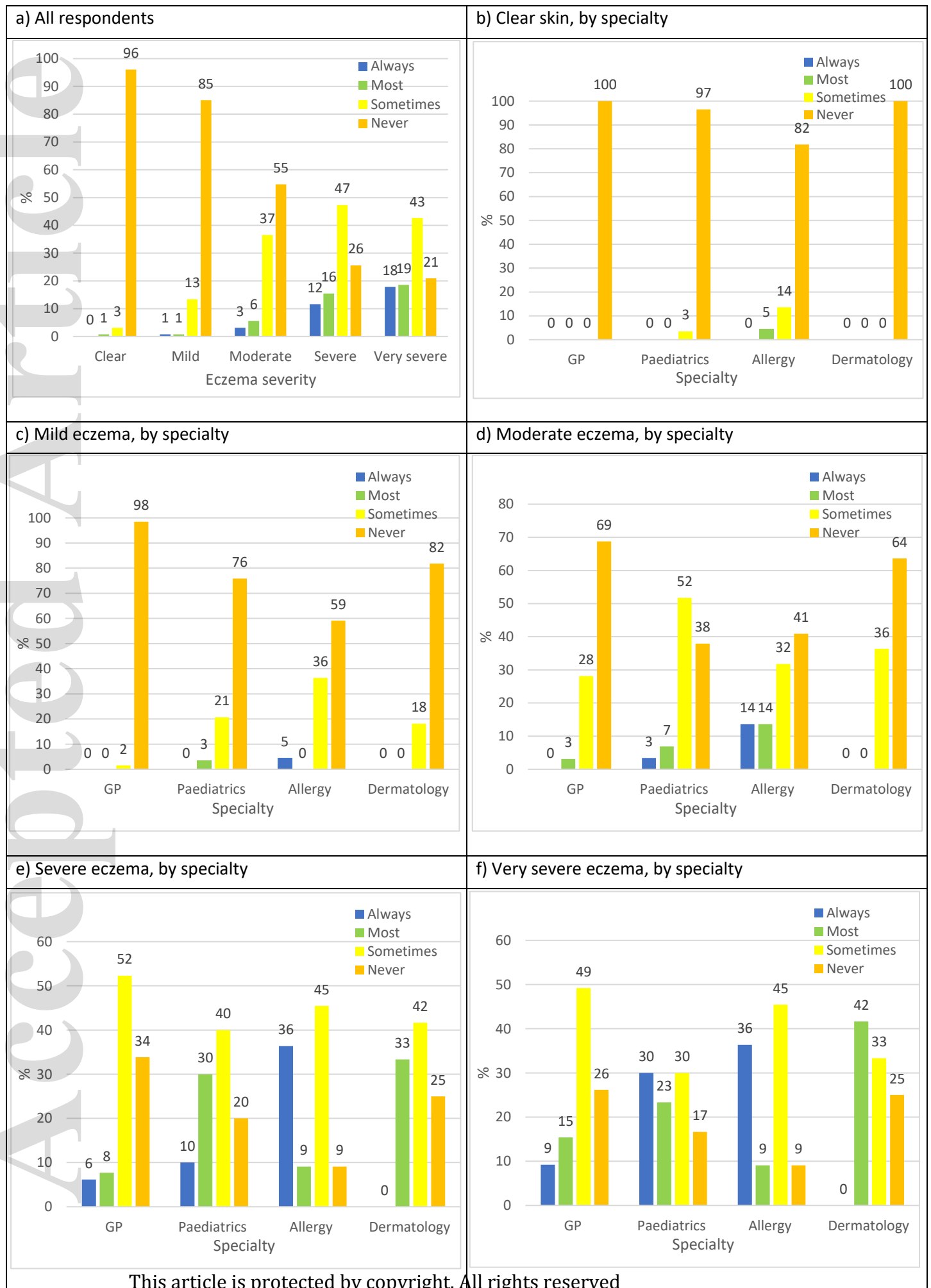
1. Eichenfield LF, Tom WL, Chamlin SL, et al. Guidelines of care for the management of atopic dermatitis: Section 1. Diagnosis and assessment of atopic dermatitis. *J Am Acad Dermatol* 2014;70(2):338-51.
2. Chan J, Ridd M. Beliefs and practices among adults with eczema and carers of children with eczema regarding the role of food allergy. *Clin Exp Dermatol* 2019;44(7):e235-e237.
3. Martin P, Eckert J, Allen K, et al. Which infants with eczema are at risk of food allergy? Results from a population-based cohort. *Clin Exp Allergy* 2015;45(1):255-264.
4. Bath-Hextall F, Delamere FM, Williams H C, et al. Dietary exclusions for improving established atopic eczema in adults and children: systematic review. *Allergy* 2009;64(2):258-264.
5. National Institute for Health and Care Excellence. Food allergy in under 19s: assessment and diagnosis [Internet]. [London] NICE 2011. (Clinical Guideline CG116) Available from: <https://www.nice.org.uk/Guidance/CG116>.

Figure 1: Use of food allergy tests on clinical history of allergic reaction to food



Accepted Article

Figure 2: Use of food allergy tests according to eczema severity



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Supplementary data

Table S1: Use of food allergy tests on clinical history of allergic reaction to food by specialty

History of food allergy	Speciality (n)	Use of food allergy tests n (%)				Chi-squared test
		Always	Most	Sometimes	Never	
None	GP (64)*	0	0	8 (13)	56 (88)	p<0.001
	Paediatrics (30)	0	2 (7)	12 (40)	16 (53)	
	Allergy (22)	0	2 (9)	15 (68)	5 (23)	
	Dermatology (12)	0	0	5 (42)	7 (58)	
Immediate	GP (65)	16 (25)	18 (28)	28 (43)	3 (5)	p<0.001
	Paediatrics (30)	22 (73)	7 (23)	1 (3)	0	
	Allergy (22)	20 (91)	2 (9)	0	0	
	Dermatology (12)	3 (25)	4 (33)	5 (42)	0	
Delayed	GP (63) **	2 (3)	9 (14)	37 (59)	15 (24)	p=0.583
	Paediatrics (30)	2 (7)	4 (13)	16 (53)	8 (27)	
	Allergy (22)	3 (14)	4 (18)	11 (50)	4 (18)	
	Dermatology (12)	0	4 (33)	5 (42)	3 (25)	
Mixed	GP (64)*	6 (9)	14 (22)	39 (61)	5 (8)	p<0.001
	Paediatrics (30)	14 (47)	13 (43)	3 (10)	0	
	Allergy (22)	12 (55)	8 (36)	2 (9)	0	
	Dermatology (12)	1 (8)	5 (42)	6 (50)	0	

*: 1 missing response; **: 2 missing responses

Table S2: Use of food allergy tests according to eczema severity by specialty

Severity of eczema	Specialty (n)	Use of food allergy tests n (%)				Chi-squared test
		Always	Most	Sometimes	Never	
Clear	GP (65)	0	0	0	65 (100)	p=0.017
	Paediatrics (29) *	0	0	1 (3)	28 (97)	
	Allergy (22)	0	1 (5)	3 (14)	18 (82)	
	Dermatology (11)*	0	0	0	11 (100)	
Mild	GP (65)	0	0	1 (2)	64 (98)	p<0.001
	Paediatrics (29)*	0	1 (3)	6 (21)	22 (76)	
	Allergy (22)	1 (5)	0	8 (36)	13 (59)	
	Dermatology (11)*	0	0	2 (18)	9 (82)	
Moderate	GP (64) *	0	2 (3)	18 (28)	44 (69)	p=0.006
	Paediatrics (29)*	1 (3)	2 (7)	15 (52)	11 (38)	
	Allergy (22)	3 (14)	3 (14)	9 (41)	7 (32)	
	Dermatology (11)*	0	0	4 (36)	7 (64)	
Severe	GP (65)	4 (6)	5 (8)	34 (52)	22 (34)	p<0.001
	Paediatrics (30)	3 (10)	9 (30)	12 (40)	6 (20)	
	Allergy (22)	8 (36)	2 (9)	10 (45)	2 (9)	
	Dermatology (12)	0	4 (33)	5 (42)	3 (25)	
Very severe	GP (65)	6 (9)	10 (15)	32 (49)	17 (26)	p=0.010
	Paediatrics (30)	9 (30%)	7 (23)	9 (30)	5 (17)	
	Allergy (22)	8 (36.)	2 (9)	10 (45)	2 (9)	
	Dermatology (12)	0	5 (42)	4 (33)	3 (25)	

*: 1 missing response