

House dust mite: a new player in intestinal inflammation?

Manon E Wildenberg, Gijs R van den Brink

Over the past decades, incidence rates of immune-mediated inflammatory diseases including asthma and IBDs have been rising steadily in both Western and low/middle-income countries.¹ The cause of this increase has been a topic of intense investigation, and a variety of factors such as diet, hygiene and pollution have been implicated. One of the most clear correlations between disease and environment is that between exposure to house dust mite (HDM) and asthma exacerbations.² HDM contains several antigens, including *Der p1*, a cysteine protease that damages the airway epithelium thus allowing antigens to pass into the pulmonary tissue.³ In atopic individuals, this results in a potent IgE-mediated specific anti-*Der p* immune response and pulmonary complaints such as allergic rhinitis and asthma.

Given the high environmental exposure of the intestinal epithelium, the involvement of food-related and microbial antigens in intestinal inflammation have been

studied widely. However, HDM was mainly considered a pulmonary antigen and received little attention in the gut. As HDM is omnipresent in the modern environment, its antigens are likely to be ingested in considerable amounts, and may thus also be involved in intestinal inflammation. In this issue of *Gut*, Tulic *et al*⁴ show that HDM allergen *Der p1* can indeed be detected in the human intestine. The cysteine protease activity of *Der p1* resulted in increased epithelial permeability, which is also suggested as a pathophysiological factor in both UC and IBS. The increased epithelial permeability did not require prior HDM sensitisation, suggesting a direct effect on the epithelium rather than an immunological response. Interestingly, data on atopic symptoms such as elevated serum IgE and positive skin prick test in IBD are conflicting.^{5 6} Some studies report increased IgE levels and enhanced reactivity to common allergens, whereas others do not find differences between patients with IBD and healthy controls. On the other hand, increased levels of asthmatic symptoms are found in patients with IBD and vice versa.^{6 7} For IBS, the role of intestinal (food) allergens has been studied extensively, but again data is conflicting. Skin prick tests and IgE measurements often fail to show abnormalities,^{8 9} but responses in

a colonic allergen provocation test were clearly enhanced. In addition, levels of self-reported atopic complaints are increased in patients with IBS in various studies.^{9 10}

The data reported by Tulic *et al* may provide an explanation for these conflicting findings, in that the common denominator between asthma and intestinal diseases such as IBD and IBS may not be in a shared underlying allergic response but in a shared trigger such as HDM components. It is highly likely that increased pulmonary exposure to HDM is accompanied by increased ingestion, leading to either asthma, intestinal symptoms or both, depending on the genetic status of the patient. Of note, building regulations regarding isolation have been sharpened considerably after the 1970s energy crisis. As a result, the indoor humidity and mite numbers have increased accordingly, correlating with the historical increase in both asthma and IBD incidence rates.¹¹ Measures aimed at reducing HDM exposure have been advocated for the prevention of asthmatic episodes. In light of the current new data regarding a possible role for HDM in intestinal disease, similar measures may be beneficial in patients with GI disease.

Competing interests None declared.

Provenance and peer review Commissioned; internally peer reviewed.



CrossMark

To cite Wildenberg ME, van den Brink GR. *Gut* 2016;**65**:727–728.

Received 17 December 2015

Accepted 18 December 2015

Department of Gastroenterology, Tytgat Institute for Liver and Intestinal Research, Academic Medical Center, Amsterdam, The Netherlands

Correspondence to Dr Manon E Wildenberg, Department of Gastroenterology, Tytgat Institute for Liver and Intestinal Research, Academic Medical Center, Meibergdreef 69-71, Amsterdam 1105 BK, The Netherlands; m.e.wildenberg@amc.nl

Commentary

Published Online First 13 January 2016

► <http://dx.doi.org/10.1136/gutjnl-2015-310523>*Gut* 2016;**65**:727–728.

doi:10.1136/gutjnl-2015-311042

REFERENCES

- 1 Molodecky NA, Soon IS, Rabi DM, *et al.* Increasing incidence and prevalence of the inflammatory bowel diseases with time, based on systematic review. *Gastroenterology* 2012;142:46–54.
- 2 Custovic A, Taggart SC, Francis HC, *et al.* Exposure to house dust mite allergens and the clinical activity of asthma. *J Allergy Clin Immunol* 1996;98:64–72.
- 3 Thomas WR, Hales BJ, Smith WA, *et al.* House dust mite allergens in asthma and allergy. *Trends Mol Med* 2010;16:321–8.
- 4 Tulic MK, Vivinus-Nébot M, Rekima A, *et al.* Presence of commensal house dust mite allergen in human gastrointestinal tract: a potential contributor to intestinal barrier dysfunction. *Gut* 2016;65:757–66.
- 5 Troncone R, Merrett TG, Ferguson A. Prevalence of atopy is unrelated to presence of inflammatory bowel disease. *Clin Allergy* 1988;18:111–17.
- 6 Tzanakis NE, Tsiligianni IG, Siafakas NM. Pulmonary involvement and allergic disorders in inflammatory bowel disease. *World J Gastroenterol* 2010;16:299–305.
- 7 Brassard P, Vutcovici M, Ernst P, *et al.* Increased incidence of inflammatory bowel disease in Quebec residents with airway diseases. *Eur Respir J* 2015;45:962–8.
- 8 Pearson JS, Niven RM, Meng J, *et al.* Immunoglobulin E in irritable bowel syndrome: another target for treatment? A case report and literature review. *Therap Adv Gastroenterol* 2015;8:270–7.
- 9 Philpott H, Gibson P, Thien F. Irritable bowel syndrome—an inflammatory disease involving mast cells. *Asia Pac Allergy* 2011;1:36–42.
- 10 Jones MP, Walker MM, Ford AC, *et al.* The overlap of atopy and functional gastrointestinal disorders among 23,471 patients in primary care. *Aliment Pharmacol Ther* 2014;40:382–91.
- 11 Vallance G, McSharry C, Wood S, *et al.* House dust mite control measures in the treatment of asthma. *Ther Clin Risk Manag* 2006;2:347–54.



House dust mite: a new player in intestinal inflammation?

Manon E Wildenberg and Gijs R van den Brink

Gut 2016 65: 727-728 originally published online January 13, 2016
doi: 10.1136/gutjnl-2015-311042

Updated information and services can be found at:
<http://gut.bmj.com/content/65/5/727>

These include:

References

This article cites 11 articles, 3 of which you can access for free at:
<http://gut.bmj.com/content/65/5/727#BIBL>

Email alerting service

Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
<http://group.bmj.com/group/rights-licensing/permissions>

To order reprints go to:
<http://journals.bmj.com/cgi/reprintform>

To subscribe to BMJ go to:
<http://group.bmj.com/subscribe/>