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GASTROINTESTINAL INFLAMMATION

Gastrointestinal *Candida* colonisation promotes sensitisation against food antigens by affecting the mucosal barrier in mice

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ABSTRACT

Backgrounds and aims: Controversy still exists as to whether gastrointestinal colonisation by *Candida albicans* contributes to aggravation of atopic dermatitis. We hypothesised that *Candida* colonisation promotes food allergy, which is known to contribute to a pathogenic response in atopic dermatitis. We tested this using a recently established murine *Candida* colonisation model.

Methods: *Candida* colonisation in the gastrointestinal tract was established by intragastric inoculation with *C albicans* in mice fed a synthetic diet. To investigate sensitisation against food antigen, mice were intragastrically administered with ovalbumin every other day for nine weeks, and antiovalbumin antibody titres were measured weekly. To examine gastrointestinal permeation of food antigen, plasma concentrations of ovalbumin were measured following intragastric administration of ovalbumin.

Results: Ovalbumin specific IgG and IgE titres were higher in BALB/c mice with *Candida* colonisation than in normal

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mice. Gastrointestinal permeation of ovalbumin was enhanced by colonisation in BALB/c mice. Histological examination showed that colonisation promoted infiltration and degranulation of mast cells. *Candida* colonisation did not enhance ovalbumin permeation in mast cell deficient W/W^v mice but did in congenic littermate control +/+ mice. Reconstitution of mast cells in W/W^v mice by transplantation of bone marrow derived mast cells restored the ability to increase ovalbumin permeation in response to *Candida* colonisation.

Conclusions: These results suggest that gastrointestinal *Candida* colonisation promotes sensitisation against food antigens, at least partly due to mast cell mediated hyperpermeability in the gastrointestinal mucosa of mice.

Abbreviations: AD, atopic dermatitis; BMMC, bone marrow derived mast cells; BSA, bovine serum albumin; HRP, horseradish peroxidase; OVA, ovalbumin; PAS, periodic acid-Schiff; PBS, phosphate buffered saline; TLR, toll-like receptor; TNF, tumour necrosis factor

Keywords: *Candida albicans*; food allergy; atopic dermatitis; mast cells

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