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Effects of Bifidobacterium breve feeding strategy and delivery modes on experimental allergic rhinitis mice

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Background: Different delivery modes may affect the susceptibility to allergic diseases. It is still unknown whether early intervention with probiotics would counteract this effect.

Aim: The effect of different delivery modes on immune status and nasal symptoms was investigated on established allergic rhinitis (AR) mouse model. In addition, the immuno-regulatory effects and mechanisms of different feeding manners with *Bifidobacterium breve (B. breve)* were examined.

Methods: Live lyophilized B. breve was orally administered to BALB/c mice born via vaginal delivery (VD) or cesarean delivery (CD) for eight consecutive weeks, after which they were sensitized by ovalbumin (OVA) to establish experimental AR. Nasal symptoms, serum immuno-globulins, cytokines, splenic percentages of $CD4^+CD25^+Foxp3^+$ regulatory T (Treg) cells and nasal eosinophil infiltration were evaluated.

Results: Compared with VD mice, mice delivered via CD demonstrated more serious nasal symptoms, higher concentrations of OVA-specific immunoglobulin (Ig) E, more nasal eosinophil and lower percentages of splenic $CD4^+CD25^+Foxp3^+$Treg cells after establishing experimental AR. These parameters were reversed by administering *B. breve* shortly after birth. However, the effect of *B. breve* did not differ between different delivery modes.

Conclusion: CD aggravates the nasal symptoms of AR mice compared to VD. This is the first report that oral administration of *B. breve* shortly after birth can significantly alleviate the symptoms of AR mice born via both deliveries, probably via activation of the regulatory capacity of $CD4^+CD25^+Foxp3^+$Treg cells.

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