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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.

**Objectives:** The effect of different delivery modes on immune status and nasal symptoms was investigated on established allergic rhinitis (AR) mouse model. In addition, the immunoregulatory 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 8 consecutive weeks, after which they were sensitized by ovalbumin (OVA) to establish experimental AR. Nasal symptoms, serum immunoglobulins, cytokines, splenic percentages of CD4<sup>+</sup> CD25<sup>+</sup> Foxp3<sup>+</sup> 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 eosinophils and lower percentages of splenic CD4<sup>+</sup> CD25<sup>+</sup> Foxp3<sup>+</sup> 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<sup>+</sup> CD25<sup>+</sup> Foxp3<sup>+</sup> Treg cells.

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