

16. BÖLÜM

ÇOCUKLUK ÇAĞI SOLUNUM YOLU ALERJİK HASTALIKLARINDA PROBIYOTİKLERİN YERİ

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Solunum yolu alerjik hastalıkları temelde alerjik rinit ve atopik astım olmak üzere iki hastalık şeklinde karşımıza çıkmaktadır. Tüm popülasyonda görülmekle birlikte özellikle çocukluk çağında bu iki hastlığın birlaklığine oldukça sık rastlanmaktadır. Ortak hava yolunu ilgilendiren her iki klinik antitenin de solunum sistemi içinde sistemik bir inflamatuar sürecin klinik belirtileri olduğu düşünülmektedir. Öyle ki, bu iki hastlığın yüksek oranda birlikte görülmemesi birçok klinik çalışmada ‘tek havayolu tek hastalık’ tanımıyla da anımlarına neden olmuştur.

Atopik astım, CD4+ Th2 tip hücrelerin sensitizasyonu ile başlar. Th2 hücrelerinden salınan interlökin (IL) 4, 5 ve 13 gibi sitokinler IgE sentezini, mast hücreleriyle eozinofillerin gelişimi ve aktivasyonunu sağlar. Benzer şekilde alerjik rinitte de olaylar alerjenin nazal mukozaya erişmesi ve alerjen sunan hücreler tarafından T hücresinin yönlendirilmesiyle başlar. Th2 yönünde farklılaşan T hücreleri yine IL-3, IL-5 ve IL-13 sitokinleri aracılıyla B hücrelerinden IgE sentezine yol açar.

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KAYNAKÇA

- Chinnakkannan, S. K., Singh, M., Das, R. R., Mathew, J. L., & Saxena, A. K. (2017). Association of allergic rhinitis and sinusitis with childhood asthma. *Indian pediatrics*, 54(1), 21-24.
- Meltzer, E. O. (2005, September). The relationships of rhinitis and asthma. In *Allergy & Asthma Proceedings* (Vol. 26, No. 5).
- Khan, D. A. (2014, September). Allergic rhinitis and asthma: epidemiology and common pathophysiology. In *Allergy & Asthma Proceedings* (Vol. 35, No. 5).
- Sih, T., & Mion, O. (2010). Allergic rhinitis in the child and associated comorbidities. *Pediatric Allergy and Immunology*, 21(1-Part-II), e107-e113.
- Lack, G. (2001). Pediatric allergic rhinitis and comorbid disorders. *Journal of allergy and clinical immunology*, 108(1), S9-S15.
- Grossman, J. (1997). One airway, one disease. *Chest*, 111(2), 11S-16S.
- Alper, M. (2003). Akciğer ve Üst Solunum Yolları. In Çevikbaş, U. (Ed.). *Robbins Temel Patoloji* (7. Edisyon, 453-459). İstanbul: Nobel Tip Kitabevleri.
- Güler, N.(2010). Alerji ve Alerjik Hastalıklar. In Neyzi, O., Ertuğrul, T. *Pediatri* (4. Baskı, 707-728). İstanbul: Nobel Tip Kitabevleri.
- Strachan, D. P. (1989). Hay fever, hygiene, and household size. *BMJ: British Medical Journal*, 299(6710), 1259.
- Brooks, C., Pearce, N., & Douwes, J. (2013). The hygiene hypothesis in allergy and asthma: an update. *Current opinion in allergy and clinical immunology*, 13(1), 70-77.
- Pershagen, G. (2000). Can immunization affect the development of allergy?. *Pediatric Allergy and Immunology*, 11, 26-28.
- Matricardi, P. M., & Ronchetti, R. (2001). Are infections protecting from atopy?. *Current opinion in allergy and clinical immunology*, 1(5), 413-419.
- Grüber, C., Kulig, M., Bergmann, R., Guggenmoos-Holzmann, I., Wahn, U., & MAS-90 Study Group. (2001). Delayed hypersensitivity to tuberculin, total immunoglobu-

- lin E, specific sensitization, and atopic manifestation in longitudinally followed early Bacille Calmette-Guerin-vaccinated and nonvaccinated children. *Pediatrics*, 107(3), e36-e36.
14. Nahori, M. A., Lagranderie, M., Lefort, J., Thouron, F., Joseph, D., Winter, N., ... & Vargaftig, B. B. (2001). Effects of *Mycobacterium bovis* BCG on the development of allergic inflammation and bronchial hyperresponsiveness in hyper-IgE BP2 mice vaccinated as newborns. *Vaccine*, 19(11-12), 1484-1495.
 15. Matricardi, P. M., Rosmini, F., Riondino, S., Fortini, M., Ferrigno, L., Rapicetta, M., & Bonini, S. (2000). Exposure to foodborne and orofecal microbes versus airborne viruses in relation to atopy and allergic asthma: epidemiological study. *Bmj*, 320(7232), 412-417.
 16. Karmaus, W., & Botezan, C. (2002). Does a higher number of siblings protect against the development of allergy and asthma? A review. *Journal of Epidemiology & Community Health*, 56(3), 209-217.
 17. Von Mutius, E., & Vercelli, D. (2010). Farm living: effects on childhood asthma and allergy. *Nature Reviews Immunology*, 10(12), 861.
 18. Ege, M. J., Frei, R., Bieli, C., Schram-Bijkerk, D., Waser, M., Benz, M. R., ... & Bruneckreef, B. (2007). Not all farming environments protect against the development of asthma and wheeze in children. *Journal of Allergy and Clinical Immunology*, 119(5), 1140-1147.
 19. Riedler, J., Eder, W., Oberfeld, G., & Schreuer, M. (1999). Austrian children living on a farm have less hay fever, asthma and allergic sensitisation. *Allergy: European Journal of Allergy & Clinical Immunology*, Supplement, 54, 6.
 20. Riedler, J., Braun-Fahrländer, C., Eder, W., Schreuer, M., Waser, M., Maisch, S., ... & ALEX Study Team. (2001). Exposure to farming in early life and development of asthma and allergy: a cross-sectional survey. *The Lancet*, 358(9288), 1129-1133.
 21. Ehrenstein, V., Mutius, V., & Kries, V. (2000). Reduced risk of hay fever and asthma among children of farmers. *Clinical & Experimental Allergy*, 30(2), 187-193.
 22. Ramsey, C. D., Gold, D. R., Litonjua, A. A., Sredl, D. L., Ryan, L., & Celedón, J. C. (2007). Respiratory illnesses in early life and asthma and atopy in childhood. *Journal of allergy and clinical immunology*, 119(1), 150-156.
 23. Douwes, J., Cheng, S., Travier, N., Cohet, C., Niesink, A., McKenzie, J., ... & Pearce, N. (2008). Farm exposure in utero may protect against asthma, hay fever and eczema. *European Respiratory Journal*.
 24. Ege, M. J., Bieli, C., Frei, R., van Strien, R. T., Riedler, J., Üblagger, E., ... & Pershagen, G. (2006). Prenatal farm exposure is related to the expression of receptors of the innate immunity and to atopic sensitization in school-age children. *Journal of Allergy and Clinical Immunology*, 117(4), 817-823.
 25. Schaub, B., Liu, J., Höppler, S., Schleich, I., Huehn, J., Olek, S., ... & von Mutius, E. (2009). Maternal farm exposure modulates neonatal immune mechanisms through regulatory T cells. *Journal of Allergy and Clinical Immunology*, 123(4), 774-782.
 26. Pfefferle, P. I., Büchele, G., Blümer, N., Roponen, M., Ege, M. J., Krauss-Etschmann, S., ... & Pekkanen, J. (2010). Cord blood cytokines are modulated by maternal farming activities and consumption of farm dairy products during pregnancy: the PASTURE Study. *Journal of allergy and clinical immunology*, 125(1), 108-115.
 27. Wopereis, H., Oozeer, R., Knipping, K., Belzer, C., & Knol, J. (2014). The first thousand days–intestinal microbiology of early life: establishing a symbiosis. *Pediatric Allergy and Immunology*, 25(5), 428-438.

27. Rusu, E., Enache, G., Cursaru, R., Alexescu, A., Radu, R., Onila, O., ... & Radulian, G. (2019). Prebiotics and probiotics in atopic dermatitis. *Experimental and Therapeutic Medicine*.
28. Dzidic, M., Abrahamsson, T., Artacho, A., Collado, M. C., Mira, A., & Jenmalm, M. C. (2018). Oral microbiota maturation during the first 7 years of life in relation to allergy development. *Allergy*.
29. Sjögren, Y. M., Jenmalm, M. C., Böttcher, M. F., Björkstén, B., & Sverremark-Ekström, E. (2009). Altered early infant gut microbiota in children developing allergy up to 5 years of age. *Clinical & Experimental Allergy*, 39(4), 518-526.
30. Abrahamsson, T. R., Jakobsson, H. E., Andersson, A. F., Björkstén, B., Engstrand, L., & Jenmalm, M. C. (2014). Low gut microbiota diversity in early infancy precedes asthma at school age. *Clinical & Experimental Allergy*, 44(6), 842-850.
31. Hotel, A. C. P., & Cordoba, A. (2001). Health and nutritional properties of probiotics in food including powder milk with live lactic acid bacteria. *Prevention*, 5(1), 1-10.
32. Frei, R., Akdis, M., & O'Mahony, L. (2015). Prebiotics, probiotics, synbiotics, and the immune system: experimental data and clinical evidence. *Current opinion in gastroenterology*, 31(2), 153-158.
33. Del Giudice, M. M., Indolfi, C., Capasso, M., Maiello, N., Decimo, F., & Ciprandi, G. (2017). Bifidobacterium mixture (B longum BB536, B infantis M-63, B breve M-16V) treatment in children with seasonal allergic rhinitis and intermittent asthma. *Italian journal of pediatrics*, 43(1), 25.
34. Zajac, A. E., Adams, A. S., & Turner, J. H. (2015, June). A systematic review and meta-analysis of probiotics for the treatment of allergic rhinitis. In International forum of allergy & rhinology (Vol. 5, No. 6, pp. 524-532).
35. Lin, T. Y., Chen, C. J., Chen, L. K., Wen, S. H., & Jan, R. H. (2013). Effect of probiotics on allergic rhinitis in Df, Dp or dust-sensitive children: a randomized double blind controlled trial. *Indian pediatrics*, 50(2), 209-213.
36. MIRAGLIA DEL GIUDICE, M., Indolfi, C., Allegorico, A., Cuppari, C., Campana, G., Strisciuglio, C., & Grandone, A. (2015). Probiotics and allergic respiratory diseases. *JOURNAL OF BIOLOGICAL REGULATORS & HOMEOSTATIC AGENTS*, 29(2 Suppl 1), 80-3.
37. Tang, R. B., Chang, J. K., & Chen, H. L. (2015). Can probiotics be used to treat allergic diseases?. *Journal of the Chinese Medical Association*, 78(3), 154-157.
38. Sudo, N., Sawamura, S. A., Tanaka, K., Aiba, Y., Kubo, C., & Koga, Y. (1997). The requirement of intestinal bacterial flora for the development of an IgE production system fully susceptible to oral tolerance induction. *The Journal of Immunology*, 159(4), 1739-1745.
39. Geuking, M. B., Cahenzli, J., Lawson, M. A., Ng, D. C., Slack, E., Hapfelmeier, S., ... & Macpherson, A. J. (2011). Intestinal bacterial colonization induces mutualistic regulatory T cell responses. *Immunity*, 34(5), 794-806.
40. Saenz, S. A., Taylor, B. C., & Artis, D. (2008). Welcome to the neighborhood: epithelial cell-derived cytokines license innate and adaptive immune responses at mucosal sites. *Immunological reviews*, 226(1), 172-190.
41. Otani, I. M., Anilkumar, A. A., Newbury, R. O., Bhagat, M., Beppu, L. Y., Dohil, R., ... & Aceves, S. S. (2013). Anti-IL-5 therapy reduces mast cell and IL-9 cell numbers in pediatric patients with eosinophilic esophagitis. *Journal of Allergy and Clinical Immunology*, 131(6), 1576-1582.

42. Mennini, M., Dahdah, L., Artesani, M. C., Fiocchi, A., & Martelli, A. (2017). Probiotics in asthma and allergy prevention. *Frontiers in Pediatrics*, 5, 165.
43. Keck, T., Balcom IV, J. H., Fernández-Del Castillo, C., Antoniu, B. A., & Warshaw, A. L. (2002). Matrix metalloproteinase-9 promotes neutrophil migration and alveolar capillary leakage in pancreatitis-associated lung injury in the rat. *Gastroenterology*, 122(1), 188-201.
44. Okada, S., Kita, H., George, T. J., Gleich, G. J., & Leiferman, K. M. (1997). Migration of eosinophils through basement membrane components in vitro: role of matrix metalloproteinase-9. *American journal of respiratory cell and molecular biology*, 17(4), 519-528.
45. Wu, C. T., Chen, P. J., Lee, Y. T., Ko, J. L., & Lue, K. H. (2016). Effects of immunomodulatory supplementation with *Lactobacillus rhamnosus* on airway inflammation in a mouse asthma model. *Journal of Microbiology, Immunology and Infection*, 49(5), 625-635.
46. Azad, M. B., Coneys, J. G., Kozyrskyj, A. L., Field, C. J., Ramsey, C. D., Becker, A. B., ... & Zarychanski, R. (2013). Probiotic supplementation during pregnancy or infancy for the prevention of asthma and wheeze: systematic review and meta-analysis. *Bmj*, 347, f6471.
47. Cabana, M. D., McKean, M., Caughey, A. B., Fong, L., Lynch, S., Wong, A., ... & Hilton, J. F. (2017). Early probiotic supplementation for eczema and asthma prevention: a randomized controlled trial. *Pediatrics*, 140(3), e20163000.
48. Zuccotti, G., Meneghin, F., Aceti, A., Barone, G., Callegari, M. L., Di Mauro, A., ... & Morelli, L. (2015). Probiotics for prevention of atopic diseases in infants: systematic review and meta-analysis. *Allergy*, 70(11), 1356-1371.
49. Muraro, A., Halken, S., Arshad, S. H., Beyer, K., Dubois, A. E. J., Du Toit, G., ... & O'Mahony, L. (2014). EAACI food allergy and anaphylaxis guidelines. Primary prevention of food allergy. *Allergy*, 69(5), 590-601.
50. Braegger, C., Chmielewska, A., Decsi, T., Kolacek, S., Mihatsch, W., Moreno, L., ... & Turck, D. (2011). Supplementation of infant formula with probiotics and/or prebiotics: a systematic review and comment by the ESPGHAN committee on nutrition. *Journal of pediatric gastroenterology and nutrition*, 52(2), 238-250.
51. Fiocchi A, Pawankar R, Cuello-Garcia C, Ahn K, Al-Hammadi S, Agarwal A, et al. World Allergy Organization-McMaster University Guidelines for allergic disease prevention (GLAD-P): probiotics. *World Allergy Organ J* (2015) 8(1):4.