What's in?

Pediatric Infectious Disease (2020): 10.5005/jp-journals-10081-1247

Source: Elias N, Nasrallah E, Khoury C, *et al*. Associations of *Helicobacter pylori* seropositivity and gastric inflammation with pediatric asthma. Pediatric Pulmonology 2020.
Since there is a controversy about a link between *Helicobacter pylori* infection and asthma in children, researchers undertook this hospital-based case-control study to test the hypotheses of inverse links of *H. pylori* seroprevalence and pepsinogen (PG) levels, as indicators of gastric inflammation, with asthma in children. Participants were children aged 4.8–17.3 years in Israel. A decreased risk of asthma was observed in relation to *H. pylori* cytotoxin-associated gene A (CagA) antigen IgG seropositivity. A lower likelihood of asthma was reported in participants who were *H. pylori* seropositive with a PGI:PGII of ≤6.78 (severe gastric inflammation) vs seronegative children. Overall, a likely protective role of *H. pylori* infection and its associated gastric inflammation was suggested against the development of asthma in children.

Source: Lallemant M, Amzal B, Sripan P, *et al*. Perinatal antiretroviral intensification to prevent intrapartum HIV transmission when antenatal antiretroviral therapy is initiated less than 8 weeks before delivery. J Acquir Immune Defic Syndr 2020;84(3):313–322.
Given a high risk of intrapartum infection among infants born to women living with HIV initiating combination antiretroviral therapy (cART) late in pregnancy, researchers here examined if mother/infant perinatal antiretroviral intensification can reduce this risk. They conducted this single-arm Bayesian trial including pregnant women with HIV receiving standard of care antiretroviral prophylaxis in Thailand (maternal antenatal lopinavir-based cART; nonbreastfed infants 4 weeks' postnatal zidovudine). The participants were offered "antiretroviral intensification" (labor single-dose nevirapine plus infant zidovudine-lamivudine-nevirapine for 2 weeks followed by zidovudine-lamivudine for 2 weeks) if their antenatal cART was started ≤8 weeks before delivery. None of the 88 mother/infant pairs receiving intensification had intrapartum transmission of HIV. Findings thereby support the effectiveness of performing mother/infant antiretroviral intensification in preventing intrapartum transmission of HIV in pregnant women receiving ≤8 weeks antepartum cART.

Source: Fujiogi M, Camargo Jr CA, Raita Y, *et al*. Respiratory viruses are associated with serum metabolome among infants hospitalized for bronchiolitis: A multicenter study. Pediatric Allergy and Immunology 2020.
Given that in the United States, bronchiolitis is the leading cause of infant hospitalizations, researchers here investigated the interrelationships between major respiratory viruses (and their species), host systemic metabolism, and disease pathobiology. In an ongoing multicenter prospective cohort study, researchers examined 113 infants (63 RSV-only, 21 RV-A, and 29 RV-C) hospitalized with bronchiolitis for their serum metabolome profile. Using the sparse partial least squares discriminant analysis, serum metabolites that are most discriminatory in the RSV-RV-A and RSV-RV-C comparisons were identified. Among 113 infants with bronchiolitis, 639 metabolites were measured. In the RSV-RV-A comparison, 30 discriminatory metabolites were identified, predominantly in lipid metabolism pathways (e.g., sphingolipids and carnitines). Multivariable models indicated significant correlation of these metabolites with the risk of clinical outcomes (e.g., tricosanoyl sphingomyelin, OR for recurrent wheezing at age of 3 years = 1.50). The discriminatory metabolites in the RSV-RV-C comparison were also primarily involved in lipid metabolism [e.g., glycerophosphocholines (GPCs), 12,13-diHome]. A significant correlation was also observed of these metabolites with the risk of outcomes (e.g., 1-stearoyl-2-linoleoyl-GPC, OR for positive pressure ventilation use during hospitalization = 0.47). Per these findings, the distinct serum metabolomic signatures of respiratory viruses and their species are linked with differential risks of acute and chronic morbidities of bronchiolitis, thereby providing further insight into the complex interrelations between viruses, host systemic response, and bronchiolitis pathobiology.

Source: Rajput C, Han M, Ishikawa T, *et al*. Early life heterologous rhinovirus infections induce an exaggerated asthma-like phenotype. J Allergy Clin Immunol 2020.
Given that early-life wheezing-associated respiratory tract infection by rhinovirus (RV) represents a risk factor for the occurrence of asthma, and that it has been earlier demonstrated that RV infection of 6-day-old BALB/c mice induces a mucous metaplasia phenotype that relies on type II innate lymphoid cells (ILC2s), researchers investigated whether early-life RV infection modifies the response to subsequent heterologous infection, causing an exaggerated asthma-like phenotype. This study included wild-type BALB/c mice and Rora fl/fl Il7r cre mice lacking ILC2s. All were treated as follows: sham on day 6 of life plus sham on day 13 of life, RV-A1B on day 6 plus sham on day 13, sham on day 6 plus RV-A2 on day 13, and RV-A1B on day 6 plus RV-A2 on day 13. They noted a raised number of bronchoalveolar lavage eosinophils and elevated expression of IL-13 mRNA but not expression of IFN-γ mRNA (which is suggestive of a type II immune response) in mice infected with RV-A1B at day 6 and sham at day 13, whereas increased IFN-γ expression (which is a mature antiviral response) was identified in mice infected with sham on day 6 and RV-A2 on day 13 of life. Overall, findings revealed early-life RV infection as a modifier of the response to subsequent heterologous infection, bringing about an intensified asthma-like phenotype that relies on ILC2s.

Source: Mir F, Pearce RE, Baig-Ansari N, *et al*. Serum amoxicillin levels in young infants (0–59 days) with sepsis treated with oral amoxicillin. Arch Dis Child 2020.

Simplified antibiotics are recommended by the WHO for young infants with sepsis in countries where hospitalization is not feasible; researchers here investigated pharmacokinetics, drug disposition, and interpopulation variability of oral amoxicillin in this demographic. They studied young infants with signs of sepsis who were enrolled in an oral amoxicillin/intramuscular gentamicin treatment arm of a sepsis trial in Karachi, Pakistan. One hundred twenty-nine samples obtained from 60 young infants were assessed for amoxicillin concentrations. Positive blood cultures with predominant gram-positive organisms were reported in 6 of 44 infants. The analysis was performed on 44 infants contributing blood at ≥2 of 3 specified timepoints. Per findings, sera of young infants had amoxicillin concentrations exceeding the susceptibility breakpoint for >50% of a 12-hour dosing interval following oral administration at 75–100 mg/kg/day daily divided doses.

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