What's In?

Pediatric Infectious Disease (2019): 10.5005/jp-journals-10081-1225

Source: Yang Q, Ruan Q, Liu X, et al. Preventive tuberculosis treatment effect on QuantiFERON TB-gold in-tube testing in a high tuberculosis-endemic country: a clinical trial. Int J Inf Dis 2020;91:182–187. DOI: 10.1016/j.ijid.2019.11.023.
Preventive treatment among high-risk populations to develop active tuberculosis (TB) is essential for TB control and elimination; however, accurate tools to evaluate the efficacy of preventive treatment are not available. T-cell interferon-γ release assays (IGRAs), such as QuantiFERON-TB Gold in-tube (QFT-GIT), are widely recommended *in vitro* diagnostic tools for the detection of latent TB infection (LTBI). Recently, IGRAs have been granted regulatory approval as a replacement for the tuberculin skin test (TST) as diagnostic tools in selected TB-risk groups, especially individuals who have received the Bacillus Calmette–Guerin (BCG) vaccination in infancy. In this prospective, open-label, controlled study, the QFT-GIT assay was used to measure IFN-γ response to *Mycobacterium tuberculosis* antigens at baseline (T0) and at 6 (T1) and 33 (T2) months after completion of therapy. The authors conclude that qualitative and quantitative reversions of QFT-GIT are not influenced by preventive treatment for TB in high-TB-burden settings. Serial QFT-GIT testing may therefore be inappropriate for evaluating preventive treatment effects.

Source: Crawt L, Atkinson E, Tedcastle, et al. Differences in antigenic structure of inactivated polio vaccines made from Sabin live-attenuated and wild-type poliovirus strains: impact on vaccine potency assays. J Infect dis 2020;221(4):544–552. DOI: 10.1093/infdis/jiz076.
Following the declaration of wild-type II poliovirus eradication in 2015, the type II component was removed from the live-attenuated oral polio vaccine (OPV). This change implies a need to improve global coverage through routine immunization with inactivated polio vaccine (IPV), to ensure type II immunity. Several manufacturers use Sabin OPV strains for IPV production [Sabin strain injectable polio vaccine (sIPV)], rather than the usual wild-type strains used for conventional IPV (cIPV). However, in contrast to cIPV, potency assays for sIPV have not been standardized, no international references exist, and no antigen units have been defined for an sIPV human dose. Thus, sIPV products from different manufacturers cannot be compared, and the relationship between antigenicity and immunogenicity of sIPV is not well understood. This collaborative study between various laboratories revealed differences in the reactivity of antibody reagents to cIPV and sIPV products. The authors conclude that, given the inconsistencies between the antigen properties of cIPV and sIPV, homologous references are required to measure the antigen content of IPV products consistently.

Source: Ae R, Abrams JY, Maddox RA, et al. Platelet count variation and risk for coronary artery abnormalities in Kawasaki disease. Pediatr Infect Dis J 2020;39(3):197–203. DOI: 10.1097/INF.0000000000002563.
Platelet count is considered as a biomarker for the development of coronary artery abnormalities (CAAs) among Kawasaki disease (KD) patients. A retrospective cohort study was conducted using KD survey data from Japan (2015–2016; $n = 25{,}448$). They observed that platelet counts rapidly decreased from admission, reached the lowest count at 6–7 days, and peaked after 10 days. Platelet counts in intravenous immunoglobulins (IVIG) nonresponders decreased with a lower minimum value than those of IVIG responders, but subsequently rebounded toward a higher maximum. The researchers concluded that the platelet count varied widely by illness day and was confounded by IVIG responsiveness, which might have contributed to previous inconsistent findings. Kawasaki disease patients with abnormally high platelet counts at admission or abnormally low counts after hospitalization were at higher risk for CAAs.

Source: Mork RL, Hogan PG, Muenks CE, et al. Longitudinal, strain-specific *Staphylococcus aureus* introduction and transmission events in households of children with community-associated methicillin-resistant *S. aureus* skin and soft tissue infection: a prospective cohort study. Lancet Infect Dis 2019;20(2):P188–P198. DOI: 10.1016/S1473-3099(19)30570-5.
Devising effective, targeted approaches to prevent recurrent methicillin-resistant *Staphylococcus aureus* (MRSA) skin and soft tissue infection requires an understanding of factors driving MRSA acquisition. The authors comprehensively define household longitudinal, strain-level *S. aureus* transmission dynamics in households of children with community-associated MRSA skin and soft tissue infection.
Otherwise healthy pediatric patients with culture-confirmed, community-onset MRSA infections and household contacts (individuals sleeping in the home ≥four nights per week) and indoor dogs and cats were recruited for the Household Observation of MRSA in the Environment (HOME) prospective cohort study from hospitals and community practices.
The authors found that the transmission recipients were less likely to own their homes and were more likely to share bedrooms with strain-colonized individuals, live in homes with higher environmental *S. aureus* contamination burden, and report interval skin and soft tissue infection. Transmission sources were more likely to share bath towels. Pets were often transmission recipients, but rarely the sole transmission source. They also found that frequent handwashing decreased the likelihood of novel strain introduction into the household.

Source: Wang X, Ni L, Wan S, et al. Febrile temperature critically controls the differentiation and pathogenicity of T helper 17 cells. Immunity 2020;52(2):328.e5–341.e5. DOI: 10.1016/j.immuni.2020.01.006.
The authors in this study demonstrate and describe the critical role of fever in shaping adaptive immune responses with implications in autoimmune diseases.

The authors show that febrile temperature selectively regulated Th17 cell differentiation *in vitro* in enhancing interleukin-17 (IL-17), IL-17F, and IL-22 expression. Th17 cells generated under febrile temperature (38.5–39.5°C), compared with those under 37°C, showed enhanced pathogenic gene expression with increased pro-inflammatory activities *in vivo*. Thus, febrile temperature promotes the differentiation and pathogenicity of Th17 cells and treatment with antipyretic agents reduced Th17 cell differentiation *in vivo*.

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