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Research in brief

Aspirin effective in COVID-19
Hospitalised patients with moderate COVID-19 who were given aspirin early in their treatment had a lower risk of dying than patients who were not given aspirin, according to a study of 112,269 patients enrolled from Jan 1, 2020, to Sept 10, 2021, at 64 health systems in the USA. The study found a 1.6% reduction in mortality when aspirin was given within the first day of hospitalisation and that patients were less prone to forming blood clots. Elderly patients and patients with one or more comorbidities were found to benefit especially from early aspirin therapy.

COVID-19 vaccine developed using yeast
A COVID-19 vaccine that is inexpensive and easier to store than RNA vaccines has been developed using the yeast Pichia pastoris and it can be made in fermentation facilities around the world. The vaccine elicited a strong immune response in animals, and the Serum Institute of India is planning a clinical trial in Africa. Researchers used a small piece of the SARS-CoV-2 spike protein, the receptor-binding domain (RBD), and chose hepatitis B surface antigen as a scaffold. These two components generated a much stronger response than the RBD protein alone, and each can be produced separately in yeast, the authors said.

CD73 implicated in HIV
Scientists studying why HIV remains in human tissues even after treatment have found that T cells of HIV patients have little to none of a protein called CD73. The lack of CD73, which is responsible for cell migration and movement into the tissue, affects the ability of T cells to find and eliminate HIV-infected cells. The researchers found that chronic inflammation results in increased levels of micro-RNAs, which bind to mRNAs to block them from making CD73. Reduced CD73 was found to protect HIV-infected people against multiple sclerosis, and the researchers want to identify ways to manipulate the CD73 gene to turn it on in patients with HIV and off in those with multiple sclerosis.

mAb neutralises hantaviruses
The first human antibody to effectively neutralise two types of hantaviruses in animal models has been discovered. Rodent-borne hantaviruses cause two types of disease: haemorrhagic fever with renal syndrome (HFRS), which is caused by Old World viruses found mostly in Europe and Asia, and hantavirus cardiopulmonary syndrome, which is caused by New World viruses typically found in North and South America. Scientists isolated several human monoclonal antibodies (mAbs) from a patient in Sweden who survived infection with Puumala virus, which causes HFRS. Through initial screening in cell culture, they identified several mAbs that effectively neutralised both Old and New World hantaviruses. They say hantavirus outbreaks in Sweden, Argentina, and the USA over the past two decades highlight the public health risks posed by these viruses. There are no approved therapies for hantavirus infection.

RVS vaccine in pregnancy reduces prescribing in infants
A blinded, multicountry trial found that infants of mothers assigned a respiratory syncytial virus (RSV) fusion vaccine during pregnancy had fewer antimicrobial prescription courses over the first 90 days of life than infants of mothers assigned placebo. The trial found that the estimated efficacy of the RSV fusion vaccine analysed against RSV-associated, medically significant lower respiratory tract infections (RTIs) did not meet the prespecified criterion for success. But vaccine efficacy was 12.9% against all new antimicrobial prescription courses and 16.6% against lower RTI-associated new antimicrobial prescription courses.

BCG more effective with antibody
Scientists have found a way to increase the effectiveness of the only approved vaccine for tuberculosis by blocking a key molecule. They combined the BCG vaccine with an antibody that blocks IL-10 receptor (IL-10R1), a molecule found to drive tuberculosis infection, for about a week. They gave the mixture to mice in one shot, waited 6 weeks to ensure the IL-10R1 blocker was no longer present and the BCG protection had been generated, and then exposed the mice to Mycobacterium tuberculosis. These mice controlled M tuberculosis infection for nearly a year, whereas the mice given only the BCG vaccine lost control of M tuberculosis infection within 2 months and had significant inflammation and damage in the lungs. Also, the mice with the vaccine and IL-10R1 blocker had higher levels of long-term memory immune cells. Trials in non-human primates are planned.

Leishmaniasis vaccine
A vaccine against Leishmania mexicana, the most common cause of cutaneous leishmaniasis in North and Central America, provided protection in mice according to a recent study. To create the vaccine, researchers applied gene-editing technology to the live parasite. The mice study showed that the vaccine was safe, causing no skin lesions in animals that were susceptible to the disease. In further experiments, researchers vaccinated mice and exposed them 6 weeks later to the L mexicana parasite. Unlike the unvaccinated control group, vaccinated mice remained clear of skin lesions, the number of parasites at the infection site was held at bay, and protection was sustained over 10 weeks.

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