Karolinska Institutet

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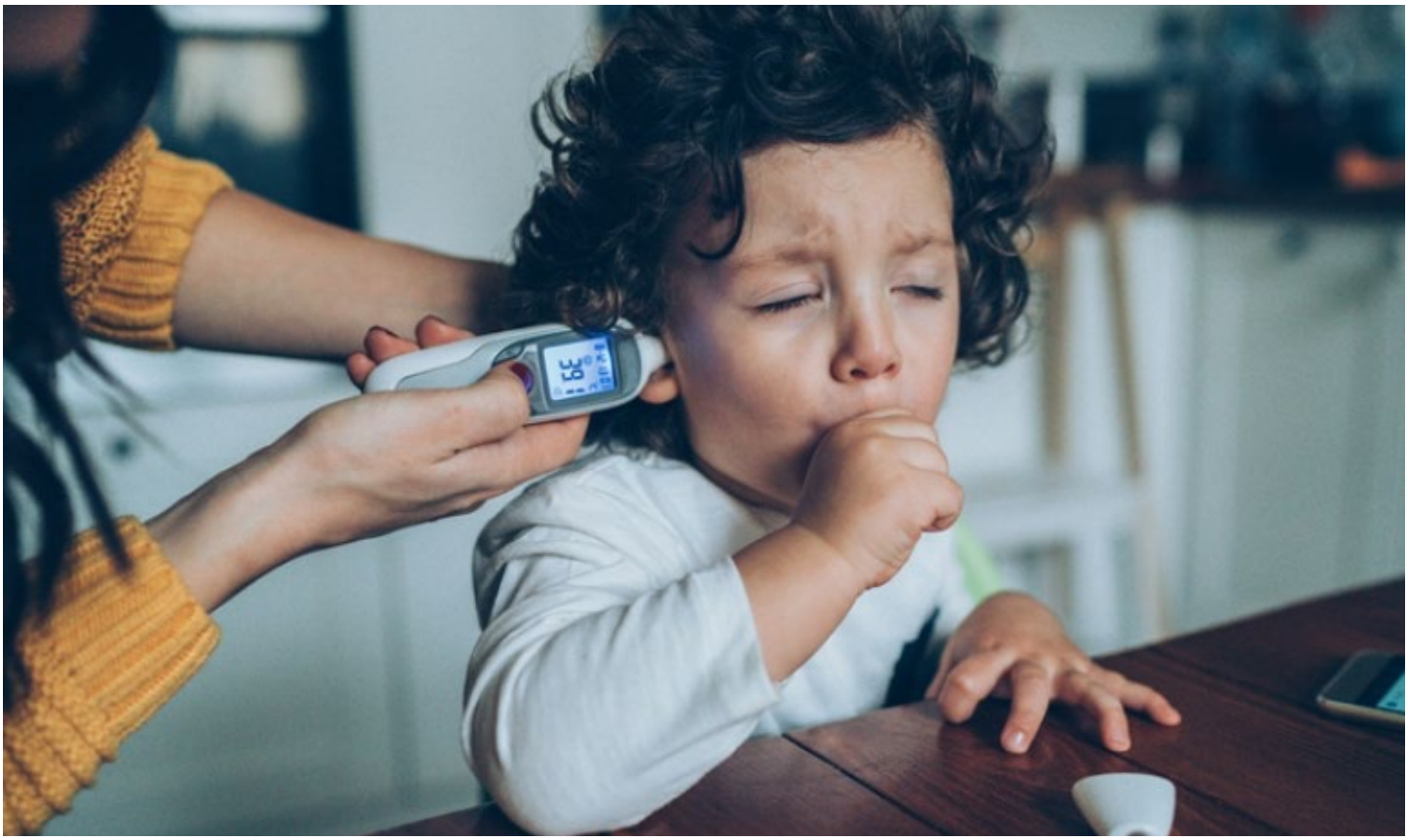

New whooping cough vaccine shows promise

Despite that the coverage of pertussis vaccination is good around the world, whooping cough remains a serious communicable disease amongst neonates and infants. Over the past decades, the number of cases of the disease has increased, even in many high-income countries. This rise has occurred after many countries stopped using the effective whole-cell pertussis vaccine (wPV) due to reported adverse effects and replaced it with a so-called acellular pertussis vaccine (aPV) in the 1990s. Pertussis vaccination was completely suspended in Sweden between 1979 and 1996.

Karin Loré.
Photo: Ulf Sirborn

“Even though the aPV we use today protects against the disease, which is very important, it doesn’t appear effective enough,” says Karin Loré, professor at the Department of Medicine, Karolinska Institutet (Solna). “Nor can it effectively prevent bacterial growth in the nose and thus stop the transmission of the disease to others. Consequently, we need to have a better pertussis vaccine.”

Administered into the nostrils

The new vaccine candidate, BPZE1, is based on a live but weakened strain of the bacteria Bordetella pertussis and is administered directly into the nostrils at one occasion. The vaccine has been developed for several years and has been shown in animal studies to induce very good protection against pertussis.

Researchers have now compared the immune response in a small number of human participants who received the vaccine (phase Ia and Ib studies) with individuals who had undergone the normal national pertussis vaccination programme. They found that the BPZE1 vaccine induces a broader antibody response (targeting more parts of the bacterium) with a better bactericidal effect.

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“This means that BPZE1 has the potential to improve vaccine efficacy and protect against transmission” says Professor Loré.

Moves into phase II

The clinical studies were led by the Public Health Agency of Sweden with the assistance of Karolinska Trial Alliance. Professor Loré’s research group at Karolinska Institutet carried out many of the analyses. The BPZE1 vaccine will now be further evaluated in a clinical phase II trial.

The study was financed by ILiAD Biotechnologies, the Swedish Research Council, the Swedish Heart and Lung Foundation, the China Scholarship Council, Karolinska Institutet, the Consul Th C Berg Foundation and Region Stockholm (ALF funding). One of the authors is CEO and founder of ILiAD Biotechnologies (developer of the BPZE1 vaccine) and two others are employed by the company. A fourth co-author holds a patent for BPZE1 and sits on the scientific advisory board of ILiAD Biotechnologies.

Publication

”Live attenuated pertussis vaccine BPZE1 induces a broad antibody response in humans”. Ang Lin, Danijela Apostolovic, Maja Jahnmatz, Frank Liang, Sebastian Ols, Teghesti Tecleab, Chenyan Wu, Marianne van Hage, Ken Solovay, Keith Rubin, Camille Locht, Rigmor Thorstensson, Marcel Thalen and Karin Loré. *Journal of Clinical Investigation*, online 16 January 2020, doi: 10.1172/JCI135020.

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