Pertussis : biology, epidemiology and prevention

Les Pensières
Fondation Mérieux Conference Center
Veyrier-du-Lac - France

11-13 November 2015

Steering Committee:

- Nicole Guiso
- Scott Halperin
- David Johnson
- Jacques Louis
- Peter McIntyre
- Kingston Mills
- Valentina Picot
- Stanley Plotkin

- Cindy Grasso meeting coordinator

des racines pour la vie • roots for life

Background

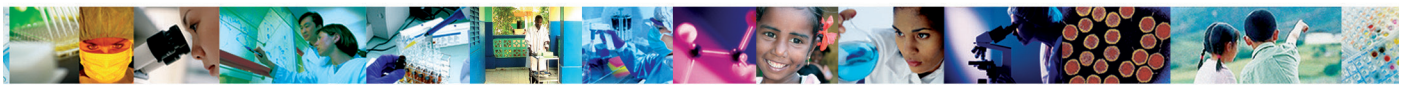
Pertussis, commonly called whooping cough, is a highly infectious disease that was previously a universal rite of passage for older infants and young children. The discovery in 1906 of its causative organism, Bordetella pertussis, led to the development of whole-cell pertussis (wP) vaccines, which by the 1930s were combined with diphtheria (D) and tetanus (T) toxoids. Countries that instituted broad DTwP vaccination programs beginning in the mid-20th century saw pertussis dramatically decrease over subsequent decades. However, concerns over reactogenicity prompted some parents to refuse wP-containing vaccines for their children and some countries to cancel their programs altogether. Less reactogenic acellular pertussis (aP) vaccines were developed to address these concerns. They were deployed in Japan nearly 35 years ago, North America and much of Europe about 15 to 20 years ago, and more recently in some other middle- and high-income countries.

During the last 5 years, multiple countries (eg, Australia, UK, US) have experienced substantial increases in reported cases of pertussis. Cases among very young infants who are at greatest risk of pertussis-related hospitalizations and mortality were most alarming. Multiple hypotheses have been posited for the current challenges with pertussis, including:

- More sensitive diagnostic tests combined with greater pertussis disease awareness;
- Inadequate vaccination schedules and poor compliance with vaccination recommendations;
- Evolution of circulating pertussis strains to evade vaccine-induced immunity;
- Suboptimal priming by and decreased duration of protection from acellular compared to whole-cell pertussis vaccines.

The purpose of this seminar is to bring together experts and interested individuals to:

- Explore the latest trends in pertussis epidemiology;
- Better understand the reasons for these trends;
- Discuss potential ways in which pertussis vaccines might be improved and the practicalities of their introduction into routine use;
- Formulate recommendations for optimal use of current vaccines, with a particular focus on strategies to minimize severe morbidity and mortality among infants during the first months of life.



Scientific programme

Wednesday 11 November 2015

16:00 - 17:00	Registration	
17:00 - 17:20	Welcome address	Fondation Mérieux
17:20 - 18:00	Key-note address 1: Pertussis vaccines, a partial success story	Jan Poolman
18:00 - 18:40	Key-note address 2: The Baboon model of infection with Pertussis	Tod Merkel
19h30	Welcome dinner	

Thursday 12 November 2015

Session 1

Biology of infection with Bordetella Pertussis: diagnosis Chair: Dave Johnson		
8:30 - 8:50	Evolution and emergence of Bordetella in humans	Eric Harvill
8:50 - 9:00	Discussion	
9:00 - 9:20	Pertussis resurgence: ACV immunity and pathogen adaptation	Ruiting Lan
9:20 - 9:30	Discussion	
9:30 - 9:50	Immunity to Bordetella Pertussis	Kingston Mills
9:50 - 10:00	Discussion	
10:00 - 10:30	Coffee Break	
10:30 - 10:50	Human immunity to Pertussis	Anne-Marie Buisman
10:50 - 11:00	Discussion	
11:00 - 11:20	The continuing problem of early diagnosis in very young infants	Jim Cherry
11:20 - 11:30	Discussion	

Scientific programme

Session 2

Epidemiology of Bordetella Pertussis - Effect of vaccination Chair: Peter McIntyre		
11:30 - 11:50	Overview of Pertussis epidemiology in the US and impact of vaccination	Stacey Martin
11:50 - 12:00	Discussion	
12:15 - 14:00	Lunch	
14:00 - 14:20	Epidemiology of Pertussis in Australia - The effect of vaccinations and cocooning	Helen Quinn
14:20 - 14:30	Discussion	
14:30 - 14:50	Epidemiology and Control of Pertussis in England: The impact of Maternal Immunisation	Gayatri Amirthalingam
14:50 - 15:00	Discussion	
15:00 - 15:20	Epidemiology of Pertussis in Africa. Maternal immunization as a possible strategy for prevention	Marta Nunes
15:20 - 15:30	Discussion	
15:30 - 16:00	Coffee break	
16:00 - 16:20	The influence of maternal antibodies on active pertussis infant vaccination-human challenge studies (project)	Scott Halperin
16:20 - 16:30	Discussion	
16:30 - 16:50	Pertussis vaccination during pregnancy: immunological effects in pregnant women, young infants and breast milk composition	Elke Leuridan
16:50 - 17:00	Discussion	
17:00 - 17:20	Vaccination of neonates: a study in Australia	Peter McIntyre
17:20 - 17:30	Discussion	
17:30 - 18:45	General discussion on waning of immunity to Pertussis	Facilitator : Peter McIntyre with the participation of speakers in sessionII
19:30	Dinner	

Scientific programme

Friday 13 November 2015

Session 3

Improving vaccination strategies with current vaccines; Development of new vaccines, some examples. Chair: Scott Halperin		
8:30 - 8:50	Report on the work of the WHO SAGE pertussis working group	Liz Miller
8:50 - 9:00	Discussion	
9:00 - 9:20	Pertussis modelling: contributions of natural and vaccines immunity on the epidemiology	Jodie Mc Vernon
9:20 - 9:30	Discussion	
9:30 - 9:50	The need for new less reactogenic whole cell vaccines	Jim Cherry
9:50 - 10:00	Discussion	
10:00 -10:30	Coffee break	
10:30 - 10:50	Genetically detoxified pertussis toxin	Mariagrazia Pizza
10:50 - 11:00	Discussion	
11:00 - 11:20	Development of a live-attenuated pertussis vaccine	Camille Locht
11:20 - 11:30	Discussion	
11:30 - 11:50	Adenylate cyclase toxin-hemolysin relevance for pertussis vaccines	Peter Sebo
11:50 - 12:00	Discussion	
12:00 - 12:15	Structured round table: 1) improved strategy for pertussis vaccination (maternal immunization, choice of existing vaccines, etc…; 2) Need for novel vaccines and 3) New adjuvants for Pertussis	Facilitators: Stanley Plotkin and Scott Halperin With the formal participation of: Norman Baylor, Peter Neels, René Raeven, Claire-Anne Siegrist and participants.
12:15 - 14:00	Lunch	
14:00 - 16:00	Structured round table - Continued	
16:00	End of meeting