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Knowledge, attitudes and practices regarding hantavirus disease and willingness to participate in a hantavirus vaccine trial in southern Chile

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Background: Hantavirus disease (HD) in Chile is caused by Andes virus with mortality rate of 35% and no specific treatment. State-of-the-art research in hantavirus vaccines (HV) allow envisioning candidate Andes vaccines in the near future. This vaccine/s will need Phase II evaluation in people at highest risk of infection, such as rural inhabitants. We aimed to assess knowledge of HD and willingness to participate in a future HV trial in two rural locations in southern Chile.

Methods & Materials: In Nov-Dec 2012, we performed a cross-sectional oral survey in Curarrehue (39°21'S; 71°34'W; population:7,706) and Corral (39°49′S 73°28′W; population:4,909). To a random sample we applied a structured knowledge, attitudes and practices questionnaire, regarding HD, vaccines and acceptability to participate in a future HV trial.

Results: We interviewed 319 people from Corral and 321 from Curarrehue, 62% female; 47% native Americans; mean age 50 years. 98% of subjects had heard about HD and 95% about the reservoir "ratón colilargo". 63% of women and 43% of men declared knowing the symptoms of HD ($p < 0.000$). 38% had adequate knowledge of the mode of transmission of HD. 98% of the people perceived HD as severe/very severe and 40% considered themselves or their families at risk. 31% referred presence of rodents in their homes and 41% in their storehouses. 75% trapped rodents without adequate precautions. With regard to vaccines over 80% declared they help prevent diseases and 93% would accept receiving a licensed HV. 58% of men and 47% of women ($p = 0.007$) would participate in HV trial because it is a benefit and to prevent disease. Only 29% would accept their children to participate with higher rejection between women. Main reason for not participating is that a new vaccine is a risk.

Conclusion: Inhabitants of these locations have adequate knowledge of the HD and of vaccines. They perceive themselves at risk and fear HD and contact with rodents or droppings is frequent. Acceptance of a licensed HV is high and nearly half would participate in a HV trial. Further educational interventions may be advisable to ensure informed voluntary consent for an HV trial.

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Current status of pneumococcal protein vaccines: A systematic review of literature

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Background: The various limitations with Pneumococcal conjugate vaccines (PCV) have prompted a relook at Pneumococcal Protein Vaccines (PPV). A formal systematic review of literature is therefore timely and relevant.

Objective:

To undertake a systematic review of literature exploring the current status of PCV in terms of efficacy, safety, effectiveness, and feasibility for use in public health programmes.

Methods & Materials: A systematic literature review was undertaken through multiple databases using the term '*pneumococcal protein vaccine*'. All citations were screened for relevance using a three-step process, examining the Title, followed by Abstract, followed by Full Text. There was no restriction in terms of study design, language of publication and nature of report. The outcomes of interest were: (i)Protein antigen under study, (ii)Status of research, (iii)Data on efficacy and safety data, and (iv)Data on effectiveness and feasibility for use in a public health programme.

Results: Preliminary search yielded 1114 citations. Current literature identified four approaches to identify protein antigens for PPV viz (i)Screening the pneumococcal genome for potential surface protein candidates and/or homologues of known virulence proteins, (ii)Anti-genomics i.e. screening the pneumococcal peptide library with human sera, and/or transcriptional analysis to identify upregulated genes, (iii)surface proteomics; and (iv)exposure of the pneumococcal surface proteins by killing the whole cell and stripping the capsule. These proteins could be used in a vaccine as a (i)standalone vaccine, (ii)carrier in a PCV, (iii)combination with PCV, and (iv)protein antigen-based vaccine.

Table 1 summarizes the current knowledge about various PPV. The potential benefits of PPV include the expectation of (i)covering all serotypes of Pneumococcus, (ii)protection against various stages of infection i.e carriage as well as disease, (iii)protection from all types of infection including disease, pneumonia, otitis media; (iv)easier and efficient manufacturing; and (v)lower cost. The challenges with introduction into a public health programme are: (i)Determination of correlates of protective efficacy, (ii)Balancing potential effectiveness of PPV against multiple serotypes versus lower efficacy against specific serotypes, and (iii)Development of a Regulatory pathway for PPV.

Table 1

Protein antigen	Research data
Pneumococcal surface protein A (PspA)	Protective aganist multiple pneumococcal serotypes in mice models of invasive disease pneumonia, and colonization. Vaccination of healthy volunteers with PspA generated antibodies aganist multiple strains that protected mice aganist invasive disease. Human studies in progess.
Pneumolysins.Pneumolysoids	Protection aganist Pneuminia and increased survival after intraperitoneal challenge. human studies in progress
Neuraminidases (Nan)	Protection aganist colonization and otitis media
Pneumococcal surface protein C (PspC)	Protection aganist colonization. Protection aganist sepsis
Pneumococcal protective protein A (PppA)	Protection aganist lung infection. Protective aganist nasopharyngeal colonization.
Pneumococcal Histidine Trial Protein D	Protective aganist animal models of invasive disease and pneumonia phase II trial reports awaited.
IC4 antigens	Protection aganist sepsis, pneumonia, nasopharyngeal carriage.

Conclusion: Despite gaps in knowledge, Pneumococcal Protein Vaccines could be an efficacious, effective and economic alternative to currently available Pneumococcal Conjugate Vaccines for the control of pneumococcal infections.

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A survey of maternal pertussis vaccine uptake in England

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Background: In 2012 the UK experienced a national outbreak of pertussis. The highest rates of infections were seen in infants aged less than 3 months and there were 14 deaths in this age group attributable to pertussis. This outbreak prompted the Department of Health (DH) to introduce a temporary vaccination programme for pregnant women with the aim of preventing infections in very young infants.

This survey aimed to estimate pertussis vaccine uptake in pregnant women and describe variations according to age, ethnicity, parity and location. Information was also gathered on influenza vaccine uptake.

Methods & Materials: This was a cross–sectional survey of vaccine uptake among women delivering in maternity units in England over a five-day period during April and May 2013. The target sample size was at least 380 women from maternity units throughout the country. Units were asked to complete surveys alongside birth paperwork for all women delivering a live birth during the 5 day period. Proportions vaccinated were calculated with 95% confidence intervals and multiple logistic regression used to assess differences in uptake.

Results: Twenty–nine trusts participated in the survey, returning 1325 surveys, 85% of which contained information about vaccine uptake. Pertussis vaccine uptake was 52.6% (range 18.1% to 72.4%). Influenza vaccine uptake was 52.2% (range 29.0% to 70.1%). Uptake of both vaccines was significantly higher in the White British ethnic group than in any other at 60% (95% CI 56% - 62%). Women in the most deprived quintile were least likely to have had either vaccine (pertussis vaccine OR v's least deprived 0.44, 95% CI 0.28–0.67/influenza vaccine OR 0.56, 95% CI 0.36–0.86). Ninety–eight per cent of this sample received the pertussis vaccine within the recommended 28–38 weeks gestation timeframe.

Conclusion: The results of this survey indicate that vaccine uptake rates in pregnant women vary significantly across regions and are affected by factors such as ethnicity and deprivation. Every opportunity should be taken to promote both pertussis and influenza vaccines to pregnant women.

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Reduction in vomiting associated with norovirus vaccination in a live norovirus human challenge study

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Background: Noroviruses (NoVs) are the leading cause of acute infectious gastroenteritis worldwide and are highly contagious. Although commonly associated with contaminated food and water, the majority of outbreaks reported in the United States are a result of person-to-person transmission. Vomiting may play a critical role in person-to-person transmission. Since environmental contamination resulting from episodes of vomiting have been implicated in norovirus outbreaks, a strategy to reduce norovirus-associated vomiting would have public health benefit.

Methods & Materials: Healthy adult subjects age 18-49 were randomized equally to two study groups to either receive two intramuscular injected doses of an investigational norovirus bivalent GI.1/GII.4 VLP vaccine or saline placebo on study days 1 and 28. On study day 56, 109 subjects were admitted to an in-patient unit and administered an oral dose of 4.4×10^3 PCR units of a live GII.4 norovirus; 56 vaccine recipients and 53 saline placebo recipi-