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Experimental human Pneumococcal carriage: Investigating the transmission of pneumococcus bacteria from hand to the nose of healthy adults

Submission date
26/06/2017

Recruitment status
No longer recruiting

Registration date
27/06/2017

Overall study status
Completed

Last Edited
17/06/2019

Condition category
Infections and Infestations

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Pneumococcus is a bacteria found in the nose. Small numbers of these bacteria are often found in the nose. Usually, the carrier does not know the bacteria are there. In most adults this is present at least once per year and more often in children. It could be that a small number of bacteria present in the nose ("nasal carriage") can help to protect people against disease. Mild infections with pneumococcus are very common, such as ear infections in children. But pneumococcus can also infect the lung (causing pneumonia) or the brain (causing meningitis) or the blood (causing sepsis). These severe infections are very uncommon in healthy adults. Very young children and adults who are elderly or those who have other illnesses are more likely to become ill. In future we may be able to protect people against severe disease from pneumococcus using a vaccine. In order to develop a vaccine, there is a need to understand how the bacteria spread. This study looks at what happens when the hands of healthy volunteers are exposed to small numbers of the bacteria and they are asked to touch their noses. This aims to mimic the possible transmission route of this bacteria from people's hands into their noses. The aim of this study is to determine the feasibility of Experimental Pneumococcal Carriage acquisition following pneumococcal transmission from hand to nostrils in order to reduce transmission.

Who can participate?
Healthy adults 18-50 years of age.

What does the study involve?
Participants are screened in order to see if they are suitable to participate. After signing consent, participants start the study, where they are administered a droplet of the bacteria on their hand or finger. Then they are asked to rub or poke their nose with their hand/finger. After this, participants are in contact with the researchers by phone for seven days. Participants attend the clinic at day two, six and nine where they provide samples from their nose. At the end of the study they are given medication to treat any bacteria if they are still carrying it.

What are the possible benefits and risks of participating?
Participants benefit from receiving financial compensation for their time and inconvenience. The risk from the tests performed in the study (such as blood tests and nasal/throat samples) is very low, as these tests are not expected to cause more than mild temporary discomfort. The study involves live bacteria, which can cause severe infection (such as pneumonia or meningitis) in people who are at high risk of infection. To minimize this risk, volunteers who are healthy and low-risk are carefully selected, and a detailed medical assessment is carried out on all potential volunteers before they start the study. In addition, a thermometer and antibiotics are provided to identify and treat infection early. The research team are available any time day or night and provide access to healthcare if required.

Where is the study run from?
Royal Liverpool University Hospital (UK)

When is the study starting and how long is it expected to run for?
March 2017-June 2017

Who is funding the study?
1. Medical Research Council (UK)
2. Unilever (UK)

Who is the main contact?
Dr Victoria Connor
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Contact information

Type(s)
Public

Contact name
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Additional identifiers

Protocol serial number
33503

Study information

Scientific Title
Hand to nose transmission of streptococcus pneumoniae in healthy participants – pilot study

Study objectives
The aim of this study is to determine the feasibility of Experimental Pneumococcal Carriage acquisition following pneumococcal transmission from hand to nostrils.

Ethics approval required
Old ethics approval format

Ethics approval(s)
North West - Liverpool East Research Ethics Committee, 02/02/2017, ref: 17/NW/0054

Study design
Observational; Design type: Cohort study

Primary study design
Observational

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Specialty: Infectious diseases and microbiology, Primary sub-specialty: Infection prevention; UKCRC code/ Disease: Infection/ Other infectious diseases

Interventions
Healthy non-smoking adult participant's hands are exposed with well-characterised, fully sequenced penicillin-sensitive pneumococci in order to observe them for the development of pneumococcal carriage.

Initially participants are seen to discuss potential study involvement, consent obtained following time for participants to make a fully informed decision about volunteering.

After consent is received, during the week prior to the start of the study participants are screened and have baseline samples taken. This involves clinical examination and medical history, nasal wash sample collection, urine sample (pregnancy test for females), viral throat swab and blood test.

If participants are still eligible following screening they are seen a week later to start the study. The first official visit is pneumococcal exposure, where a droplet pneumococcal bacteria is administered to one hand or one finger. Participants are asked to actively attempt to facilitate transmission of pneumococci bacteria from hand to nose by either rubbing their nose (with exposed area) or by poking their nose (with exposed finger). This may be done while the bacteria is still wet or following drying time. Following this exposure day participants have daily telephone contact with a researcher (by telephone) for seven days for safety. They are also supplied a safety pack which includes thermometer for participants to take their temperatures each day for seven days, safety information leaflet and back up antibiotics if needed.

Participants attend the clinic two, six and nine days following this exposure where they undergo a nasal wash to obtain samples for analysis of nasal carriage of the bacteria. At the end of the study (day nine) we will advise participants to take three days of amoxicillin to clear carriage if they still are carrying the bacteria in their noses.

The total duration of the study (observation and follow-up) is three weeks, with a maximum of six visits (including consent visit).

Intervention Type
Other

Primary outcome(s)
Primary outcome measure as of 17/09/2018:
1. Detection of 6B pneumococci is measured by using classical culture methods from nasal wash recovered from the participants at days two, six and nine.
2. Recruitment rate recorded as the number of eligible participants who consent to participate in the study by 6 months
3. To inform estimation of sample size for a future trial by measuring the colonization rates in one of the four transmission groups in a full cohort of participants

Previous primary outcome measure:
Detection of 6B pneumococci is measured by using classical culture methods from nasal wash recovered from the participants at days two, six and nine.

Key secondary outcome(s))
Secondary outcome measures as of 17/09/2018
1. Density and duration of pneumococcus carriage is measured using classical culture methods from nasal wash recovered at day 2, 6 and
2. Rate of pneumococcal carriage among participants who were expose to and attempted transmission following drying of the bacterial stock is measured using classical culture methods from nasal wash recovered at day two, six and nine
3. Rate of pneumococcal carriage among participants who were expose to and attempted transmission with wet bacteria stock is measured using classical culture methods from nasal wash recovered at day two, six and nine
4. Assessment of safety of the trial procedures
5. Assessment of any serious concerns about the acceptability of the interventions and feasibility of the trial procedures

Previous secondary outcome measures:
1. Density and duration of pneumococcus carriage is measured using classical culture methods from nasal wash recovered at day 2, 6 and 9
2. Rate of pneumococcal carriage among participants who were expose to and attempted transmission following drying of the bacterial stock is measured using classical culture methods from nasal wash recovered at day two, six and nine
3. Rate of pneumococcal carriage among participants who were expose to and attempted transmission with wet bacteria stock is measured using classical culture methods from nasal wash recovered at day two, six and nine

Completion date
01/06/2017

Eligibility

Key inclusion criteria
1. Adults aged 18-50 years (chosen to minimise the risk of pneumococcal infection, and to allow comparison with previously published experimental work done by our group)
2. Fluent spoken English - to ensure a comprehensive understanding of the research project and their proposed involvement
3. Access to their own mobile telephone – to ensure safety and timely communication
4. Capacity to give informed consent

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Upper age limit
50 years

Sex
All

Total final enrolment
73

Key exclusion criteria
1. Previous pneumococcal vaccination
2. History of major pneumococcal illness
3. Close physical contact with at risk individuals (children under 5 years of age, immunosuppressed adults, elderly, chronic ill health) - minimise risk of pneumococcal transmission
4. Allergy to penicillin/amoxicillin
5. Any current treatment for asthma – confounding effect of medications such as corticosteroids, and propensity to infection
6. Any acute dermatological illness or skin injury affecting the hands or face- confounding effects of topical medications and propensity to infection
7. Taking daily medications that may affect the immune system e.g. steroids, steroid nasal spray, antibiotics and roacutanne.
8. Current illness, acute illness within 3 days prior to inoculation or antibiotic treatment within 2 weeks of inoculation
9. Pregnancy - minimise risk of pneumococcal disease
10. Diagnosed as diabetic
11. Involved in another clinical trial unless observational or in follow-up (non-interventional) phase.

12. Have been involved in a EHPC clinical trial involving pneumococcal inoculation in the last 3 years
13. History of drug or alcohol abuse
14. History of Smoking
15. Current regular smoker (smokes daily/ smokes > 5 cigarettes per week) - minimise risk of pneumococcal disease
16. Recent smoker i.e. within the last 6 months - minimise risk of pneumococcal disease
17. Ex-smoker with a significant smoking history (> 10 pack years) – minimise risk of pneumococcal disease
18. Unable to give fully informed consent

It is anticipated that 10-15% participants of screened participants will have natural pneumococcal colonisation at the time of recruitment as demonstrated by the initial nasal wash. These individuals will be excluded from the study after screening visits.

Date of first enrolment
19/04/2017

Date of final enrolment
19/05/2017

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Royal Liverpool and Broadgreen University Hospitals
Clinical Research Unit
Royal Liverpool and Broadgreen University Hospitals
Prescott Street
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L7 8XP

Sponsor information

Organisation
Liverpool School of Tropical Medicine

ROR
https://ror.org/03svjbs84

Funder(s)

Funder type
Government

Funder Name
Medical Research Council

Alternative Name(s)
Medical Research Council (United Kingdom), UK Medical Research Council, Medical Research Committee and Advisory Council, MRC

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Funder Name
Unilever

Alternative Name(s)
Unilever Global, Unilever PLC, U

Funding Body Type
Government organisation

Funding Body Subtype
For-profit companies (industry)

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are/will be available upon request. Data requests should be submitted to the EHPC coordinator (Catherine. Molloy@lstmed.ac.uk); these are considered by the program leads, and will be subject to data transfer agreements and ethical review if necessary.

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	10/10/2018	17/06/2019	Yes	No
Basic results		04/10/2018	04/10/2018	No	No
HRA research summary			28/06/2023	No	No
Study website	Study website	11/11/2025	11/11/2025	No	Yes