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Investigation of a novel new test to aid revision surgery following hip or knee replacement infection

Submission date
16/10/2017

Recruitment status
No longer recruiting

Registration date
24/10/2017

Overall study status
Completed

Last Edited
01/04/2019

Condition category
Surgery

[X] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
Alpha defensin is a marker found in blood and increases in response to infection. Previous studies have shown that increases when a patient has infection around a hip or knee replacement with accuracy similar, if not better, to tests currently used. One way of testing for alpha defensin uses a 'pregnancy test' type device, where a small sample of joint fluid is put onto the test and it gives you an instant result. This is useful because it means a test can be done in theatre and the surgeon has an answer straight away about whether there is infection or not and this can then alter what type of operation needs to be done. When a hip or knee replacement is infected it can be difficult to treat. The best chance of getting rid of the infection completely is to take out the joint replacement and thoroughly clean out the remaining bone and soft tissues – this is called 'first stage revision surgery.' The patient is then left without a joint replacement for at least 6 weeks and is given a course of antibiotics. Following this the surgical team use blood tests and take small samples of fluid from the joint using a needle to see if there is any sign left of infection. If these tests suggest the infection has gone the patient then has a new joint replacement put back in – this is the 'second stage revision surgery.' During this second stage more samples are taken from the joint tissues and sent to the laboratory to see if any bugs are grown. However, these results take several days to come back and if they do show infection it is too late by then. The aim of this study is to find out if a negative alpha defensin test result is a good indicator of a successfully treated, just like a positive alpha defensin test is a good indicator of ongoing infection.

Who can participate?
Adults aged 18 and older who are undergoing a second stage revision surgery following periprosthetic joint infection of either hip or knees.

What does the study involve?
Participants are seen by their operating team on the day of surgery (as per routine practice) to explain the study to them and to consent them for the joint aspirate sampling intra-operatively and for the review and recording of relevant medical notes, bloods results and xrays (please see consent form attached). The participant goes into surgery as per routine practice. The surgeon

takes a fluid sample from the joint being operated on and pass it out to a member of the research team who tests the sample for alpha defensin whilst in theatre – the results of which are then recorded. The operation then continues as planned and further samples will be taken and sent to the microbiology laboratory (as per routine practice). A member of the research team reviews the patient's medical notes, blood results and xrays. The results of the microbiology samples sent intra-operatively are followed up but no patient follow-up is required.

What are the possible benefits and risks of participating?
There are no direct benefits to the patients but they will be helping develop the research surrounding treatment of periprosthetic joint infection, something that is notoriously difficult and this is a condition that has affected these individuals directly. There are no risks with participating. Joint fluid samples and tissue samples are taken part of second stage revision surgery routinely. The outcome of the alpha defensin test will not influence their future treatment or management.

Where is the study run from?
1. Freeman Hospital
2. Northumbria Healthcare NHS Foundation Trust
3. Sunderland Royal Hospital
4. James Cook University Hospital

When is the study starting and how long is it expected to run for?
June 2017 to February 2019

Who is funding the study?
1. ZimmerBiomet Ltd (UK)
2. Newcastle upon Tyne Hospitals NHS Foundation Trust (UK)

Who is the main contact?
Miss Lucy Walker

Contact information

Type(s)
Scientific

Contact name
Miss Lucy Walker

Contact details
Freeman Hospital
Freeman Road
Newcastle-upon-Tyne
United Kingdom
NE7 7DN

Additional identifiers

Protocol serial number
8581

Study information

Scientific Title
Alpha defensin use in Periprosthetic Joint Infection revision surgery

Study objectives
Research questions:
1. Alpha defensin levels are known to rise in association with periprosthetic joint infection. Do these levels then decrease to give a negative alpha defensin test result once the PJI has been successfully treated?
2. If a negative alpha defensin test result has good sensitivity and specificity for diagnosing clearance of PJI can this then be used as a screening tool prior to proceeding to a second stage revision joint arthroplasty?

Ethics approval required
Old ethics approval format

Ethics approval(s)
Not provided at time of registration

Study design
Prospective cohort study

Primary study design
Observational

Study type(s)
Diagnostic

Health condition(s) or problem(s) studied
Patients undergoing second stage revision surgery for previous periprosthetic joint infection (either hip or knee) previously proven with microbiology results

Interventions
Patients undergoing a second stage revision surgery following periprosthetic joint infection of either hip or knee are identified by their direct care team.

The participant is seen by their operating team on the day of surgery (as per routine practice) and are asked whether they consent to a member of the research team discussing with them about potentially participating in a study.

If the patient agrees a member of the research team explains the study to them (with the use of a patient information sheet – please see attached) and then consent them for the joint aspirate sampling intra-operatively and for the review and recording of relevant medical notes, bloods results and xrays (please see consent form attached).

The participant then goes into surgery as per routine practice.

Intra-operatively the surgeon takes a fluid sample from the joint being operated on and pass it out to a member of the research team who test the sample for alpha defensin whilst in theatre –

the results of which are then recorded.
The operation then continues as planned and further samples are taken and sent to the microbiology laboratory (as per routine practice).

That is the end of the direct patient involvement.

A member of the research team review the patient's medical notes, blood results and xrays.

The results of the microbiology samples sent intra-operatively are followed up but no patient follow-up is required.

Intervention Type
Other

Primary outcome(s)
Alpha defensin is measured using the Synovasure lateral flow assays at the time of the second stage revision surgery.

Key secondary outcome(s))
1. The correlation between alpha defensin results and the microbiology culture results is measured using the intra-operative Synovasure result and the final culture result from the intra-operative samples at approximately 5 days post-operatively (once enhanced culture results are available)
2. Variance in the accuracy of alpha defensin in showing effective clearance of a previously infected joint prosthesis according to different patient groups is measured using patient demographics collated from review of medical notes, results and xrays retrospectively from the time that the patient first presented with symptoms leading to the diagnosis of PJI up until their second stage revision surgery

Completion date
28/02/2019

Eligibility

Key inclusion criteria
1. Undergoing second stage revision surgery following periprosthetic joint infection of either hip or knee
2. Previous periprosthetic joint infection proven with culture results
3. Aged over 18 years

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit

18 years

Sex
All

Key exclusion criteria
1. Patient unwilling to consent
2. Patient lacks capacity to consent
3. Patient unable to consent due to communication or language barrier
4. Surgeon unwilling to take intra-operative aspirate sample

Date of first enrolment
01/11/2017

Date of final enrolment
30/10/2018

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Freeman Hospital
Newcastle-upon-Tyne Hospitals Foundation Trust
Freeman Road
Newcastle-upon-Tyne
United Kingdom
NE7 7DN

Study participating centre
Northumbria Healthcare NHS Foundation Trust
Woodhorn Lane
Ashington
United Kingdom
NE63 9JJ

Study participating centre
Sunderland Royal Hospital
Kayll Road
Sunderland
United Kingdom
SR4 7TP

Study participating centre
James Cook University Hospital
Marton Road
Middlesbrough
United Kingdom
TS4 3BW

Sponsor information

Organisation
Newcastle-upon-Tyne Hospitals Foundation Trust

ROR
https://ror.org/05p40t847

Funder(s)

Funder type
Industry

Funder Name
ZimmerBiomet

Funder Name
Newcastle upon Tyne Hospitals NHS Foundation Trust

Alternative Name(s)
Newcastle upon Tyne Hospitals NHS Trust

Funding Body Type
Government organisation

Funding Body Subtype
Local government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

The current data sharing plans for the current study are unknown and will be made available at a later date.

IPD sharing plan summary

Data sharing statement to be made available at a later date

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet		24/10/2017	01/04/2019	No	Yes