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Transfusion antenatally in pregnant women with sickle cell disease

Submission date
25/01/2019

Recruitment status
No longer recruiting

Registration date
02/08/2019

Overall study status
Completed

Last Edited
03/07/2024

Condition category
Haematological Disorders

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

Plain English summary of protocol

Background and study aims
Sickle Cell Disease (SCD) is a serious inherited blood disorder affecting red blood cells. When oxygen levels drop the red cells become abnormally shaped and unable to move through the blood vessels easily. Blood and oxygen do not reach body organs, resulting in episodes of severe pain and other complications. Pregnant women with SCD have an increased risk of both sickle and pregnancy complications, including raised blood pressure. Their babies may grow more slowly in the womb, are more likely to be born early and need special care, and have a higher risk of dying. The only treatments currently available for women with SCD are Hydroxycarbamide (which cannot be used during pregnancy) and blood transfusion. Currently, blood transfusion is only used during pregnancy to treat emergency complications. Giving blood transfusions throughout pregnancy could improve outcomes for both mother and babies. In Serial Prophylactic Exchange Blood Transfusion (SPEBT), sickle blood is mechanically removed and simultaneously replaced with donor red cells. The researchers wish to conduct a trial of SPEBT given every 6-10 weeks, starting before 18 weeks of pregnancy, compared to standard care, and measure outcomes for the women (e.g. hospital admission, frequency of crisis) and their infants (e.g. early delivery, birthweight). Before they embark on a large multi-centre study the aim of this study is to find out whether this is feasible.

Who can participate?
Pregnant women aged 18 years and over with SCD

What does the study involve?
Participants are randomly allocated to have either SPEBT or standard care. The researchers assess how many pregnant women are willing to join the study and how many participants remain part of the study until the end to give an indication of how many participants they may be able to recruit in the future trial.

What are the possible benefits and risks of participating?
Blood transfusions are regularly used in the clinical care of women with SCD during pregnancy. In the UK, many precautions are taken to make sure any blood transfusion is as safe as possible. The main risk from a transfusion is that the wrong blood is given by accident. To avoid this happening the clinical staff will make careful identification checks. The risk of contracting a

disease, such as hepatitis or human immunodeficiency virus (HIV), is extremely low. There may be minor reactions of blood transfusion such as skin rash or a minor fever. These can be treated easily with paracetamol and antihistamines. Occasionally a patient experiences a delayed transfusion reaction which may occur within the first two weeks of being transfused. Patients will be informed of the possible symptoms of a delayed transfusion reaction and asked to attend hospital immediately for assessment should these symptoms occur. Possible complications specific to exchange blood transfusions are light-headedness, fainting and a tingling sensation on lips and fingers. This is due to the anticoagulant used, which lowers calcium levels in the blood. Calcium tablets or an injection may be given during the procedure to prevent this.

Where is the study run from?
Guy's and St Thomas' NHS Foundation Trust (UK)

When is the study starting and how long is it expected to run for?
April 2019 to April 2023

Who is funding the study?
NIHR Research for Patient Benefit Programme (UK)

Who is the main contact?
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Contact information

Type(s)
Scientific

Contact name
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Additional identifiers

ClinicalTrials.gov (NCT)
NCT03975894

Protocol serial number
CPMS: 39564; V1.0 24/10/2018

Study information

Scientific Title
A feasibility trial of serial prophylactic exchange blood transfusion (SPEBT) in pregnant women with sickle cell disease (SCD) aiming to improve maternal and infant outcomes

Acronym
TAPS2

Study objectives
Is it feasible to conduct an RCT to establish the effectiveness and cost-effectiveness of Serial Prophylactic Exchange Blood Transfusion (SPEBT) from the first trimester (under or equal to 18 weeks of gestation) improving clinical and cost effectiveness outcomes in pregnant women with sickle cell disease and their newborn babies?

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 28/03/2019, London – Surrey Borders Research Ethics Committee (Research Ethics Committee (REC) London Centre, Ground Floor, Skipton House, 80 London Road, London SE1 6LH, UK; Tel: +44 (0)207 972 2568; Email: NRESCommittee.London-SurreyBorders@nhs.net), REC ref: 18/LO/2070

Primary study design
Interventional

Study design
Individually randomized two-arm feasibility trial

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Sickle Cell Disease in pregnancy

Interventions
Women allocated to the intervention will receive serial prophylactic exchange blood transfusion starting from or before 18 weeks of gestation. These serial exchange blood transfusions will be performed using automated erythrocytopheresis, approximately every 6-10 weeks, aiming to maintain HbS% below 30%. The number of units will depend on patient size and pre-transfusion HbS%. The transfusion will be carried out on the haematology day unit prior to 20 weeks and on the antenatal day unit after 20 weeks gestation and will be performed by trained apheresis staff using standard operating procedures. Venous access will be via peripheral access if possible or by femoral line access if not.

Women in the control group will receive standard care for sickle cell disease in pregnancy according to NICE guidelines.

Intervention Type
Procedure/Surgery

Primary outcome(s)

Feasibility outcome:
1. Recruitment rate, measured as women eligible: women randomised, measured at baseline

Key secondary outcome(s)
Feasibility outcomes:
1. Reasons for refusal assessed by self-report at baseline
2. Rate of attrition measured as the number of participants consented who remain in the study until 6 weeks postpartum, measured at 6 weeks postpartum
3. Reasons for attrition assessed by self-report at study drop-out
4. Protocol adherence measured as the number of participants in the intervention arm who receive the intervention as outlined in the protocol, measured at pregnancy end/birth

Clinical outcomes for the woman:
1. Maternal hospital admissions: antenatal and postnatal inpatient stays measured every 6-8 weeks from enrolment to 6 weeks postpartum
2. Frequency and severity of painful crisis: self-reported pain (mild/moderate/severe/extremely severe) and use of opioid analgesics, measured every 6-8 weeks from enrolment to 6 weeks postpartum
3. Mode of birth: delivery type extracted from hospital records (assessed at birth)
4. SCD-related complications: report of any SCD-related complications (acute chest syndrome, stroke, pre-eclampsia, venous thromboembolism) as notified by health professionals or extracted from hospital records (assessed at birth)

Clinical outcomes for the infant:
1. Fetal demise/stillbirth, as notified by health professional or extracted from hospital records, assessed at pregnancy end
2. Infant birthweight: birthweight extracted from hospital records, assessed at birth
3. Gestation at birth: gestation in weeks and days extracted from hospital records, assessed at birth
4. NICU/critical care admission: extracted from hospital records or self-reported by mother at 6 weeks postpartum

Safety outcomes:
1. Transfusion reaction: reported by health professional (incident reporting).
2. Delayed haemolytic transfusion reaction: reported by health professional (incident reporting).
3. Alloimmunisation: irregular presence of red cell antibodies as measured by routine blood test measured every 6-8 weeks from enrolment to 6 weeks postpartum

Completion date
01/04/2023

Eligibility

Key inclusion criteria
1. Pregnant women with SCD (all genotypes) with confirmatory laboratory results
2. Singleton pregnancies
3. 18 years or older
4. Gestation 18 weeks or below
5. Able to give informed consent

Participant type(s)

Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Sex
Female

Total final enrolment
35

Key exclusion criteria
1. Women on long term transfusion programme prior to pregnancy for amelioration of SCD
2. Women unable to receive blood transfusion for social, religious or clinical reasons
3. Pregnant women with sickle cell disease with current diagnosis of major medical or psychiatric comorbidity which in the randomising clinician's opinion renders them unable to enter trial

Date of first enrolment
02/05/2019

Date of final enrolment
01/10/2022

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Guy's and St Thomas' NHS Foundation Trust
Westminster Bridge Road
London
United Kingdom
SE1 7EH

Study participating centre
King's College Hospital NHS Foundation Trust
Denmark Hill
London

United Kingdom
SE5 9RS

Study participating centre
St George’s University Hospitals NHS Foundation Trust
Blackshaw Road
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SW17 0QT

Study participating centre
St Mary's Hospital, Manchester University NHS Foundation Trust
Oxford Road
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M13 9WL

Study participating centre
Whittington Health NHS Trust
Magdala Avenue
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United Kingdom
N19 5NF

Study participating centre
Imperial College Healthcare NHS Trust
Du Cane Road
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United Kingdom
W12 0HS

Study participating centre
University Hospitals of Leicester NHS Trust
Ground Floor, Osborne Building
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LE1 5WW

Sponsor information

Organisation
Guy's and St Thomas' NHS Foundation Trust

ROR
https://ror.org/00j161312

Funder(s)

Funder type
Government

Funder Name
Research for Patient Benefit Programme

Alternative Name(s)
NIHR Research for Patient Benefit Programme, Research for Patient Benefit (RfPB), The NIHR Research for Patient Benefit (RfPB), RfPB

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The 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?
Results article		02/07/2024	03/07/2024	Yes	No
Protocol article	protocol	20/04/2020	22/04/2020	Yes	No

HRA research summary			28/06/2023	No	No
Participant information sheet			23/05/2022	No	Yes
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes
Statistical Analysis Plan		24/03/2023	27/03/2023	No	No
Study website	Study website	11/11/2025	11/11/2025	No	Yes