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Treatment of severe Diabetic macular oedema with Anti-vascular endothelial growth factor (anti-VEGF) monotherapy versus treatment with anti-VEGF followed by subthreshold Micropulse lasEr when the thickness of the central retina goes below 400 microns: a pragmatic randomised equivalence trial

Submission date 27/09/2024	**Recruitment status** Recruiting	[X] Prospectively registered [X] Protocol [ ] Statistical analysis plan [ ] Results [ ] Individual participant data [X] Record updated in last year
Registration date 18/11/2024	**Overall study status** Ongoing	
Last Edited 30/12/2025	**Condition category** Eye Diseases	

Plain English summary of protocol

Background and study aims

The macula is the centre of the retina; it gives central sight, colour and fine detail. People with diabetes may develop diabetic macular oedema (DMO). In DMO, fluid leaks from blood vessels and builds up at the macula, causing sight loss. DMO can be mild or severe; this is determined by measuring, in microns (μm), how thick the macula is. One μm is one-thousandth of a millimetre. People presenting with mild DMO (macula less than 400 μm thick; normally it is around 250 μm but varies with sex and ethnicity) are offered macular laser treatment. Laser works well for these patients. Subthreshold micropulse laser (SML), which does not damage the macula, works as well as standard laser, which produces a burn, and is cost-effective.

However, many people present with severe DMO (macula 400 μm or thicker) where the laser does not work well. The standard treatment is eye injections of anti-VEGFs. VEGF stands for vascular endothelial growth factor. VEGF is high in eyes with DMO and causes blood vessel leakage. Anti-VEGFs block VEGF. They are given monthly to begin with, then every 2-3 months for months or years until DMO clears. In many patients DMO comes back after clearing and anti-VEGFs need to be re-started most often monthly initially again.

To improve the care of people with severe DMO this study will compare the current standard care (anti-VEGFs alone) with a strategy in which patients begin with an anti-VEGF but switch to SML once the macula is less than 400 μm thick.

Who can participate?

Patients aged over 18 years with type 1 or type 2 diabetes and severe DMO

What does the study involve?
Participants are randomly allocated to be treated with either anti-VEGFs alone or anti-VEGFs then SML once the macula is less than 400 µm thick.

What are the possible benefits and risks of participating?
It is considered that the risk associated with the anti-VEGF and SML used within the DAME study is no higher than the risk of standard care. There are a number of expected events associated with the administration of anti-VEGF, SML and intravitreal steroids, Patients will be asked at each visit specifically about each of the following: self-reported central/paracentral scotomas, self-reported reduced colour vision, self-reported metamorphopsia, corneal epithelial erosion, corneal ulcer, endophthalmitis, intraocular inflammation (anterior, posterior or panuveitis), intraocular pressure elevation (over 21 mmHg), intraocular haemorrhage (suprachoroidal /vitreous/pre-retinal haemorrhage), retinal tear, retinal detachment, retinal vasculitis, retinal vascular occlusion (retinal vein or retinal artery occlusion), lens touch (which may occur at the time of an intravitreal injection and may be seen only post-administration in the form of a focal cataract), allergic reaction to any treatments given, including eye drops, angina, myocardial infarction, stroke, transient ischaemic attack (TIA), kidney disease. These events will be collected as safety outcomes and any adverse effects will be monitored by the trial team and DMEC.

Where is the study run from?
Queen's University Belfast (UK)

When is the study starting and how long is it expected to run for?
September 2024 to September 2028

Who is funding the study?
National Institute for Health and Care Research (UK)

Who is the main contact?
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Contact information

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Scientific, Principal investigator

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Public

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

Integrated Research Application System (IRAS)
1010626

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
24014NL-UC, CPMS 65230

Study information

Scientific Title
Treatment of severe Diabetic macular oedema with Anti-vascular endothelial growth factor (anti-VEGF) monotherapy versus treatment with anti-VEGF followed by subthreshold Micropulse lasEr when the thickness of the central retina goes below 400 microns: a pragmatic randomised equivalence trial

Acronym
DAME

Study objectives
Primary objective:
To determine if the clinical effectiveness of anti-VEGFs and SML is equivalent to anti-VEGF monotherapy

Secondary objectives:
1. To determine the cost-effectiveness of anti-VEGFs and SML compared to anti-VEGF monotherapy via an economic evaluation
2. To evaluate the participant experience and acceptability of anti-VEGFs and SML compared to anti-VEGF monotherapy via a mixed methods evaluation
3. To evaluate the post-trial implementation and scalability of anti-VEGFs and SML via a process evaluation

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 15/11/2024, South Central - Oxford B Research Ethics Committee (Health Research Authority, 2 Redman Place, Stratford, E20 1JQ, United Kingdom; +44 (0)207 104 8134, +44 (0) 207 104 8019; oxfordb.rec@hra.nhs.uk), ref: 24/SC/0330

Study design
Pragmatic allocation-concealed single-masked (outcome assessors) multicentre randomized (1:1) equivalence trial

Primary study design
Interventional

Study type(s)
Efficacy, Safety

Health condition(s) or problem(s) studied
Severe diabetic macular oedema (DMO).

Interventions
Comparator Arm: Anti-VEGF Monotherapy (standard care)
Anti-VEGFs including ranibizumab and biosimilars, aflibercept, faricimab, and brolucizumab will be used, as per the standard of care at participating sites. The anti-VEGF should be administered in line with the summary of product characteristics (SmPC).

Intervention Arm: Subthreshold Micropulse Laser (SML)
SML will be applied in line with the DAME Guideline and follow the DAME participant pathway.

Eligible participants who provide consent will be randomised 1:1 to receive SML or to continue with anti-VEGF monotherapy. A minimisation algorithm will be used to ensure balanced allocation of participants across trial arms for potentially important factors including centre, duration of DMO (≤1year, >1year), number of doses of anti-VEGFs received up to the time of randomisation (1-6; 7-12), type of anti-VEGF used (ranibizumab, ranibizumab-biosimilar, Brolucizumab, aflibercept, or faricimab) up to the time of randomisation, which will be continued throughout the trial unless lack of efficacy is observed and rescue treatment is needed, presenting BCVA [BCVA ≥ 69 ETDRS letters (Snellen equivalent ≥ 20/40; logMAR ≥ 0.3), 24–68 ETDRS letters (Snellen equivalent ≤20/50-20/320; logMAR 0.4–1.2) and CI-DMO (Yes, No). Minimising randomisation by these variables will ensure both trial arms will be balanced with regard to these potentially important baseline characteristics.

Intervention Type
Drug

Phase
Phase III

Drug/device/biological/vaccine name(s)
Aflibercept, brolucizumab, ranibizumab, faricimab

Primary outcome(s)
Change in best corrected visual acuity (BCVA) in the study eye from randomisation (baseline) to 104 weeks (24 months) (equivalence margin +/- 5 ETDRS letters)

Key secondary outcome(s))
All measured at 104 weeks (24 months) from randomisation:
1. Central Retinal Thickness in the study eye. CRT in the central 1 mm of the retina as measured using Spectral-Domain optical Coherence Tomography (SD- OCT)
2. Health-related and vision-related quality of life. National Eye Institute Visual Function Questionnaire (NEI VFQ) 25 and the EuroQoL (EQ 5D 5L) questionnaire
3. Safety based on determined safety outcomes, adverse events, and serious adverse events
4. Number of treatments used (anti-VEGF injections, SML sessions) in the study eye from baseline to week 104
5. Number/proportion of people receiving “rescue” treatment in the study eye from baseline to week 104
6. Number of rescue treatments received in the study eye from baseline to week 104
7. Number/proportion of people discontinuing treatment (with reasons)
8. Number/proportion of people losing (with reasons) ≥5, ≥10 and ≥15 ETDRS letters of best-corrected visual acuity (from baseline to week 104) in the study eye
9. Number/proportion of people gaining ≥5, ≥10 and ≥15 ETDRS letters (from baseline to week 104) in the study eye
10. Number/proportion of people with CRT ≤300µm in the study eye in the central 1 mm if the retina as determined using SD-OCT
11. Number/proportion of people with no DMO, as determined by the ophthalmologists evaluating the patient
12. Health and social care service use and non-healthcare costs as determined using a Health Service Use Questionnaire and Patient Cost Questionnaire
13. Participant experience and acceptability as determined by focus group discussions, the Acceptability Questionnaire (Theoretical Framework of Acceptability (TFA)) distributed at week 104, and also by the use of Visual Analogue Score questionnaires that will be distributed 60 minutes prior to treatment, immediately after treatment and 24 hours after treatment at all instances in which treatment is given

Completion date
30/09/2028

Eligibility

Key inclusion criteria
1. Adults (>18 years)
2. Diabetes type 1 or type 2
3. Presented with severe centre-involving (CI)-DMO (CRT ≥400 µm)
4. Within the first year of initiating anti-VEGF therapy but who still have DMO and their CRT is below 400 µm (and it remains, at the time of randomisation) following anti-VEGF therapy in either one eye or both eyes

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 years

Upper age limit
100 years

Sex
All

Total final enrolment
0

Key exclusion criteria
1. Causes of macular oedema other than DMO
2. DMO with CRT ≥400 µm
3. Receipt of anti-VEGFs before their presentation with severe DMO (previous macular laser treatment for DMO is allowed)
4. Use of unlicensed anti-VEGFs (e.g. bevacizumab)
5. Inability, for any reason, to attend study visits
6. Active proliferative diabetic retinopathy (PDR) (treated and inactive PDR is allowed)
7. Use of pioglitazone which cannot be stopped for the duration of the trial
8. Cataract surgery or laser pan-retinal photocoagulation (PRP) within the previous 6 weeks
9. Currently enrolled in a CTIMP (Clinical Trial of an Investigational Medical Product)
10. Declined consent for participation

Date of first enrolment
19/05/2025

Date of final enrolment
30/04/2026

Locations

Countries of recruitment
United Kingdom

England

Northern Ireland

Scotland

Wales

Study participating centre

The Hillingdon Hospital
Pield Heath Road
Uxbridge
England
UB8 3NN

Study participating centre
Frimley Park Hospital
Portsmouth Road
Frimley
Camberley
England
GU16 7UJ

Study participating centre
Kings College Hospital
Mapother House
De Crespigny Park
Denmark Hill
London
England
SE5 8AB

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

Study participating centre
Chelsea and Westminster Hospital
Chelsea & Westminster Hospital
369 Fulham Road
London
England
SW10 9NH

Study participating centre
Central Middlesex Hospital
Acton Lane

London
England
NW10 7NS

Study participating centre
Moorfields Eye Hospital
162 City Road
London
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EC1V 2PD

Study participating centre
Sunderland Eye Hospital
Queen Alexandra Rd
Sunderland
England
SR2 9HP

Study participating centre
Royal Gwent Hospital
Cardiff Road
Newport
Wales
NP20 2UB

Study participating centre
Bristol Eye Hospital
Lower Maudlin Street
Bristol
England
BS1 2LX

Study participating centre
University Hospital Southampton
Southampton University Hospital
Tremona Road
Southampton
England
SO16 6YD

Study participating centre
Gloucestershire Royal Hospital
Great Western Road
Gloucester
England
GL1 3NN

Study participating centre
Royal Liverpool University Hospital
Royal Liverpool University Hospital
Prescot Street
Liverpool
England
L7 8XP

Study participating centre
Hull Royal Infirmary
Anlaby Road
Hull
England
HU3 2JZ

Study participating centre
Queens Medical Centre
Nottingham University Hospital
Derby Road
Nottingham
England
NG7 2UH

Study participating centre
Royal Victoria Hospital
274 Grosvenor Road
Belfast
Northern Ireland
BT12 6BA

Study participating centre
The Sussex Eye Hospital
Eastern Road

Brighton
England
BN2 5BF

Study participating centre
Torbay Hospital
Torbay Hospital
Newton Road
Torquay
England
TQ2 7AA

Study participating centre
Birmingham Midland Eye Centre (bmec)
City Hospital N H S Trust
Dudley Road
Birmingham
England
B18 7QH

Study participating centre
Sandwell and West Birmingham Hospitals NHS Trust
Midland Metropolitan University Hos
Grove Lane
Smethwick
England
B66 2QT

Study participating centre
Singleton Hospital
Sketty Lane
Sketty
Swansea
Wales
SA2 8QA

Study participating centre
Swansea Bay University Local Health Board
Tonna Hospital
Tonna Uchaf
Tonna

Neath
Wales
SA11 3LX

Study participating centre
Moorfields Eye Centre at Bedford Hospital (south)
Kempston Road
Bedford
England
MK42 9DJ

Study participating centre
Whipps Cross Hospital
Leytonstone
Whipps Cross Road
London
England
E11 1NR

Sponsor information

Organisation
Belfast Health and Social Care Trust

ROR
https://ror.org/02tdmfk69

Funder(s)

Funder type
Government

Funder Name
National Institute for Health and Care Research

Alternative Name(s)
National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

Funding Body Type

Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated and/or analysed during the current study during this study will be included in the subsequent results publication.

IPD sharing plan summary
Published as a supplement to the results publication

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol file	version 2.0	09/09/2024	01/10/2024	No	No
Protocol file	version 4.0	02/05/2025	30/12/2025	No	No
Study website		11/11/2025	11/11/2025	No	Yes