



Clinical trial results:

A Phase I/IIa Sporozoite Challenge Study to Assess the Efficacy of Candidate Combination Malaria Vaccine Approaches using the ChAd63 and MVA vectors encoding the antigens ME-TRAP, CS and AMA1.

Summary

EudraCT number	2012-004416-66
Trial protocol	GB
Global end of trial date	14 October 2013

Results information

Result version number	v1 (current)
This version publication date	15 July 2016
First version publication date	07 August 2015

Trial information

Trial identification

Sponsor protocol code	VAC052
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Additional study identifiers

ISRCTN number	-
ClinicalTrials.gov id (NCT number)	NCT01739036
WHO universal trial number (UTN)	-

Notes:

Sponsors

Sponsor organisation name	University of Oxford, CTRG
Sponsor organisation address	Old Road, Oxford, United Kingdom, OX3 7LE
Public contact	Dr Alison Lawrie, University of Oxford, +44 1865857382, alison.lawrie@ndm.ox.ac.uk
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Notes:

Paediatric regulatory details

Is trial part of an agreed paediatric investigation plan (PIP)	No
Does article 45 of REGULATION (EC) No 1901/2006 apply to this trial?	No
Does article 46 of REGULATION (EC) No 1901/2006 apply to this trial?	No

Notes:

Results analysis stage

Analysis stage	Final
Date of interim/final analysis	14 October 2013
Is this the analysis of the primary completion data?	Yes
Primary completion date	14 October 2013
Global end of trial reached?	Yes
Global end of trial date	14 October 2013
Was the trial ended prematurely?	No

Notes:

General information about the trial

Main objective of the trial:

Primary Objective: To assess the efficacy of each of two combinations of heterologous prime-boost immunisation strategies:

1. ChAd63-MVA ME-TRAP combined with ChAd63-MVA CS
2. ChAd63-MVA ME-TRAP combined with ChAd63-MVA CS and ChAd63-MVA AMA1

Secondary Objectives: To assess the safety and immunogenicity of heterologous prime-boost immunisation of malaria-naïve individuals with ChAd63-MVA ME-TRAP combined with ChAd63-MVA CS. To assess the safety and immunogenicity of heterologous prime-boost immunisation of malaria-naïve individuals with ChAd63-MVA ME-TRAP combined with ChAd63-MVA CS and ChAd63-MVA AMA1.

Protection of trial subjects:

- Volunteers given at least 24 hours to read the VIS before being seen and then given plenty of opportunity to ask questions prior to agreeing to take part in the study.
- Screening visit including full medical history, physical examination and baseline blood tests to ensure volunteers are healthy prior to enrolment.
- Vaccination carried out in clinical environment with staff trained in resuscitation in case of allergic reaction.
- Safety review prior to dose escalations (LSM)
- Total blood volume taken during the study was kept to a volume that should not compromise healthy volunteers.
- Volunteers observed for 30 mins after vaccination to monitor for any immediate adverse effects.
- Volunteers seen within 1 day of vaccination for safety review and provided with 24/7 contact number for trial clinician and emergency contact card for the department.
- ECG and cholesterol checked prior to enrolment to aid cardiac risk assessment
- Age range 18 – 45 years
- Volunteers given emergency contact card detailing that they have been infected with malaria.
- Volunteers seen twice daily once blood stage malaria is possible with twice daily malaria films and PCR
- Malaria treated promptly when diagnosed with highly efficacious medication and at least half of doses directly observed.
- Volunteers provided with symptomatic treatment (antipyretic/analgesic and antiemetic) in case of malaria symptoms.
- Volunteers followed up until at least 2 consecutive negative blood films seen.

Background therapy:

Riamet, Malarone or Chloroquine for treatment of malaria infection.
Paracetamol for pain relief.

Evidence for comparator:

No comparator

Actual start date of recruitment	04 April 2013
Long term follow-up planned	No
Independent data monitoring committee (IDMC) involvement?	No

Notes:

Population of trial subjects

Subjects enrolled per country

Country: Number of subjects enrolled	United Kingdom: 37
Worldwide total number of subjects	37
EEA total number of subjects	37

Notes:

Subjects enrolled per age group

In utero	0
Preterm newborn - gestational age < 37 wk	0
Newborns (0-27 days)	0
Infants and toddlers (28 days-23 months)	0
Children (2-11 years)	0
Adolescents (12-17 years)	0
Adults (18-64 years)	37
From 65 to 84 years	0
85 years and over	0

Subject disposition

Recruitment

Recruitment details: -

Pre-assignment

Screening details:

Inclusion / Exclusion criteria
Informed Consent Questionnaire
Informed consent
Medical History
Physical Examination
Urinalysis
 β -HCG urine (women only)
Review contraindications
Physical Observations
HBV,HCV,HIV
Haematology
Biochemistry
Anti- P. Falciparum serology

Pre-assignment period milestones

Number of subjects started	37
Number of subjects completed	37

Period 1

Period 1 title	Day 0
Is this the baseline period?	Yes
Allocation method	Randomised - controlled
Blinding used	Not blinded

Arms

Are arms mutually exclusive?	Yes
Arm title	Group 1

Arm description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp,
followed by intramuscular administration of a mixture of MVA ME-TRAP 2 x 10⁸ pfu and MVA CS 2 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Arm type	Experimental
Investigational medicinal product name	ChAd63 ME-TRAP
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Solution for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Mixture of ChAd63 CS 5 x 10¹⁰ vp and ChAd63 ME-TRAP 5 x 10¹⁰ vp to be administered as the first vaccination of Group 1 participants

Investigational medicinal product name	ChAd63 CS
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Solution for injection

Routes of administration	Intramuscular use
Dosage and administration details: Mixture of ChAd63 CS 5 x 1010 vp and ChAd63 ME-TRAP 5 x 1010 vp to be administered as the first vaccination of Group 1 participants	
Arm title	Group 2
Arm description: Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 1010 vp and ChAd63 CS 5 x 1010 vp and ChAd63 AMA1 5 x 1010 vp followed by intramuscular administration of a mixture of MVA ME-TRAP 1.33 x 108 pfu and MVA CS 1.33 x 108 pfu and MVA AMA1 1.33 x 108 pfu eight weeks later, followed by controlled human malaria infection 17-24 days later.	
Arm type	Experimental
Investigational medicinal product name	ChAd63 ME-TRAP
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Solution for injection
Routes of administration	Intramuscular use
Dosage and administration details: Mixture of ChAd63 CS 5 x 1010 vp, ChAd63 ME-TRAP 5 x 1010 vp, and ChAd63 AMA1 5 x 1010 vp to be administered as the first vaccination of Group 2 participants	
Investigational medicinal product name	ChAd63 CS
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Solution for injection
Routes of administration	Intramuscular use
Dosage and administration details: Mixture of ChAd63 CS 5 x 1010 vp, ChAd63 ME-TRAP 5 x 1010 vp, and ChAd63 AMA1 5 x 1010 vp to be administered as the first vaccination of Group 2 participants	
Arm title	Group 3
Arm description: Controlled human malaria infection administered at an interval of approximately 8-12 months after the initial controlled human malaria infection that the volunteers received in the VAC045 clinical trial.	
Arm type	Re-challenge/Previously vaccinated
No investigational medicinal product assigned in this arm	
Arm title	Group 4
Arm description: Unvaccinated control volunteers who undergo controlled human malaria infection.	
Arm type	No intervention
No investigational medicinal product assigned in this arm	

Number of subjects in period 1	Group 1	Group 2	Group 3
Started	15	15	1
Completed	15	15	1

Number of subjects in period 1	Group 4
Started	6
Completed	6

Period 2

Period 2 title	Day 56
Is this the baseline period?	No
Allocation method	Randomised - controlled
Blinding used	Not blinded

Arms

Are arms mutually exclusive?	Yes
Arm title	Group 1

Arm description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp, followed by intramuscular administration of a mixture of MVA ME-TRAP 2 x 10⁸ pfu and MVA CS 2 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Arm type	Experimental
Investigational medicinal product name	ChAd63 ME-TRAP
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Solution for injection
Routes of administration	Intramuscular use

Dosage and administration details:

2. Mixture of MVA CS 2 x 10⁸ pfu and MVA ME-TRAP 2 x 10⁸ pfu to be administered as the second vaccination of Group 1 participants

Investigational medicinal product name	ChAd63 CS
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Solution for injection
Routes of administration	Intramuscular use

Dosage and administration details:

2. Mixture of MVA CS 2 x 10⁸ pfu and MVA ME-TRAP 2 x 10⁸ pfu to be administered as the second vaccination of Group 1 participants

Arm title	Group 2
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Arm description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp and ChAd63 AMA1 5 x 10¹⁰ vp

followed by intramuscular administration of a mixture of MVA ME-TRAP 1.33 x 10⁸ pfu and MVA CS 1.33 x 10⁸ pfu and MVA AMA1 1.33 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Arm type	Experimental
Investigational medicinal product name	ChAd63 ME-TRAP
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Solution for injection
Routes of administration	Intramuscular use
Dosage and administration details:	
Mixture of MVA CS 1.33 x 10 ⁸ pfu, MVA ME-TRAP 1.33 x 10 ⁸ pfu, and MVA AMA1 1.33 x 10 ⁸ pfu to be administered as the second vaccination of Group 2 participants	
Investigational medicinal product name	ChAd63 CS
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Solution for injection
Routes of administration	Intramuscular use
Dosage and administration details:	
Mixture of MVA CS 1.33 x 10 ⁸ pfu, MVA ME-TRAP 1.33 x 10 ⁸ pfu, and MVA AMA1 1.33 x 10 ⁸ pfu to be administered as the second vaccination of Group 2 participants	
Arm title	Group 3
Arm description:	
Controlled human malaria infection administered at an interval of approximately 8-12 months after the initial controlled human malaria infection that the volunteers received in the VAC045 clinical trial.	
Arm type	Re-challenge/Previously vaccinated
No investigational medicinal product assigned in this arm	
Arm title	Group 4
Arm description:	
Unvaccinated control volunteers who undergo controlled human malaria infection.	
Arm type	No intervention
No investigational medicinal product assigned in this arm	

Number of subjects in period 2	Group 1	Group 2	Group 3
Started	15	15	1
Completed	15	14	1
Not completed	0	1	0
Consent withdrawn by subject	-	1	-

Number of subjects in period 2	Group 4
Started	6
Completed	6
Not completed	0
Consent withdrawn by subject	-

Period 3	
Period 3 title	Malaria Challenge
Is this the baseline period?	No
Allocation method	Randomised - controlled
Blinding used	Not blinded
Arms	
Are arms mutually exclusive?	Yes
Arm title	Group 1
Arm description:	
Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10 ¹⁰ vp and ChAd63 CS 5 x 10 ¹⁰ vp,	
followed by intramuscular administration of a mixture of MVA ME-TRAP 2 x 10 ⁸ pfu and MVA CS 2 x 10 ⁸ pfu eight weeks later,	
followed by controlled human malaria infection 17-24 days later.	
Arm type	Malaria Challenge
No investigational medicinal product assigned in this arm	
Arm title	Group 2
Arm description:	
Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10 ¹⁰ vp and ChAd63 CS 5 x 10 ¹⁰ vp and ChAd63 AMA1 5 x 10 ¹⁰ vp	
followed by intramuscular administration of a mixture of MVA ME-TRAP 1.33 x 10 ⁸ pfu and MVA CS 1.33 x 10 ⁸ pfu and MVA AMA1 1.33 x 10 ⁸ pfu eight weeks later,	
followed by controlled human malaria infection 17-24 days later.	
Arm type	Malaria Challenge
No investigational medicinal product assigned in this arm	
Arm title	Group 3
Arm description:	
Controlled human malaria infection administered at an interval of approximately 8-12 months after the initial controlled human malaria infection that the volunteers received in the VAC045 clinical trial.	
Arm type	Re-challenge/Previously vaccinated
No investigational medicinal product assigned in this arm	
Arm title	Group 4
Arm description:	
Unvaccinated control volunteers who undergo controlled human malaria infection.	
Arm type	Malaria Challenge
No investigational medicinal product assigned in this arm	

Number of subjects in period 3	Group 1	Group 2	Group 3
Started	15	14	1
Completed	13	13	1
Not completed	2	1	0
Consent withdrawn by subject	2	1	-

Number of subjects in period 3	Group 4
Started	6
Completed	6
Not completed	0
Consent withdrawn by subject	-

Period 4

Period 4 title	Follow Up
Is this the baseline period?	No
Allocation method	Randomised - controlled
Blinding used	Not blinded

Arms

Are arms mutually exclusive?	Yes
Arm title	Group 1

Arm description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp,

followed by intramuscular administration of a mixture of MVA ME-TRAP 2 x 10⁸ pfu and MVA CS 2 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Arm type	No intervention
No investigational medicinal product assigned in this arm	
Arm title	Group 2

Arm description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp and ChAd63 AMA1 5 x 10¹⁰ vp

followed by intramuscular administration of a mixture of MVA ME-TRAP 1.33 x 10⁸ pfu and MVA CS 1.33 x 10⁸ pfu and MVA AMA1 1.33 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Arm type	No intervention
No investigational medicinal product assigned in this arm	
Arm title	Group 3

Arm description:

Controlled human malaria infection administered at an interval of approximately 8-12 months after the initial controlled human malaria infection that the volunteers received in the VAC045 clinical trial.

Arm type	No intervention
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No investigational medicinal product assigned in this arm	
Arm title	Group 4
Arm description:	
Unvaccinated control volunteers who undergo controlled human malaria infection.	
Arm type	No intervention
No investigational medicinal product assigned in this arm	

Number of subjects in period 4	Group 1	Group 2	Group 3
Started	13	13	1
Completed	13	13	1

Number of subjects in period 4	Group 4
Started	6
Completed	6

Baseline characteristics

Reporting groups

Reporting group title	Group 1
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Reporting group description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp, followed by intramuscular administration of a mixture of MVA ME-TRAP 2 x 10⁸ pfu and MVA CS 2 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Reporting group title	Group 2
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Reporting group description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp and ChAd63 AMA1 5 x 10¹⁰ vp

followed by intramuscular administration of a mixture of MVA ME-TRAP 1.33 x 10⁸ pfu and MVA CS 1.33 x 10⁸ pfu and MVA AMA1 1.33 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Reporting group title	Group 3
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Reporting group description:

Controlled human malaria infection administered at an interval of approximately 8-12 months after the initial controlled human malaria infection that the volunteers received in the VAC045 clinical trial.

Reporting group title	Group 4
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Reporting group description:

Unvaccinated control volunteers who undergo controlled human malaria infection.

Reporting group values	Group 1	Group 2	Group 3
Number of subjects	15	15	1
Age categorical			
Healthy adult volunteers			
Units: Subjects			
Adults (18-64 years)	15	15	1
In utero	0	0	0
Preterm newborn infants (gestational age < 37 wks)	0	0	0
Newborns (0-27 days)	0	0	0
Infants and toddlers (28 days-23 months)	0	0	0
Children (2-11 years)	0	0	0
Adolescents (12-17 years)	0	0	0
From 65-84 years	0	0	0
85 years and over	0	0	0
Gender categorical			
Units: Subjects			
Female	2	5	0
Male	13	10	1

Reporting group values	Group 4	Total	
Number of subjects	6	37	

Age categorical			
Healthy adult volunteers			
Units: Subjects			
Adults (18-64 years)	6	37	
In utero	0	0	
Preterm newborn infants (gestational age < 37 wks)	0	0	
Newborns (0-27 days)	0	0	
Infants and toddlers (28 days-23 months)	0	0	
Children (2-11 years)	0	0	
Adolescents (12-17 years)	0	0	
From 65-84 years	0	0	
85 years and over	0	0	
Gender categorical			
Units: Subjects			
Female	5	12	
Male	1	25	

End points

End points reporting groups

Reporting group title	Group 1
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Reporting group description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp, followed by intramuscular administration of a mixture of MVA ME-TRAP 2 x 10⁸ pfu and MVA CS 2 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Reporting group title	Group 2
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Reporting group description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp and ChAd63 AMA1 5 x 10¹⁰ vp

followed by intramuscular administration of a mixture of MVA ME-TRAP 1.33 x 10⁸ pfu and MVA CS 1.33 x 10⁸ pfu and MVA AMA1 1.33 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Reporting group title	Group 3
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Reporting group description:

Controlled human malaria infection administered at an interval of approximately 8-12 months after the initial controlled human malaria infection that the volunteers received in the VAC045 clinical trial.

Reporting group title	Group 4
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Reporting group description:

Unvaccinated control volunteers who undergo controlled human malaria infection.

Reporting group title	Group 1
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Reporting group description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp, followed by intramuscular administration of a mixture of MVA ME-TRAP 2 x 10⁸ pfu and MVA CS 2 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Reporting group title	Group 2
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Reporting group description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp and ChAd63 AMA1 5 x 10¹⁰ vp

followed by intramuscular administration of a mixture of MVA ME-TRAP 1.33 x 10⁸ pfu and MVA CS 1.33 x 10⁸ pfu and MVA AMA1 1.33 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Reporting group title	Group 3
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Reporting group description:

Controlled human malaria infection administered at an interval of approximately 8-12 months after the initial controlled human malaria infection that the volunteers received in the VAC045 clinical trial.

Reporting group title	Group 4
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Reporting group description:

Unvaccinated control volunteers who undergo controlled human malaria infection.

Reporting group title	Group 1
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Reporting group description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp,

followed by intramuscular administration of a mixture of MVA ME-TRAP 2 x 10⁸ pfu and MVA CS 2 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Reporting group title	Group 2
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Reporting group description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp and ChAd63 AMA1 5 x 10¹⁰ vp

followed by intramuscular administration of a mixture of MVA ME-TRAP 1.33 x 10⁸ pfu and MVA CS 1.33 x 10⁸ pfu and MVA AMA1 1.33 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Reporting group title	Group 3
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Reporting group description:

Controlled human malaria infection administered at an interval of approximately 8-12 months after the initial controlled human malaria infection that the volunteers received in the VAC045 clinical trial.

Reporting group title	Group 4
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Reporting group description:

Unvaccinated control volunteers who undergo controlled human malaria infection.

Reporting group title	Group 1
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Reporting group description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp,

followed by intramuscular administration of a mixture of MVA ME-TRAP 2 x 10⁸ pfu and MVA CS 2 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Reporting group title	Group 2
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Reporting group description:

Intramuscular administration of a mixture of ChAd63 ME-TRAP 5 x 10¹⁰ vp and ChAd63 CS 5 x 10¹⁰ vp and ChAd63 AMA1 5 x 10¹⁰ vp

followed by intramuscular administration of a mixture of MVA ME-TRAP 1.33 x 10⁸ pfu and MVA CS 1.33 x 10⁸ pfu and MVA AMA1 1.33 x 10⁸ pfu eight weeks later,

followed by controlled human malaria infection 17-24 days later.

Reporting group title	Group 3
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Reporting group description:

Controlled human malaria infection administered at an interval of approximately 8-12 months after the initial controlled human malaria infection that the volunteers received in the VAC045 clinical trial.

Reporting group title	Group 4
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Reporting group description:

Unvaccinated control volunteers who undergo controlled human malaria infection.

Primary: Controlled human malaria infection of sporozoites

End point title	Controlled human malaria infection of sporozoites ^[1]
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End point description:

End point type	Primary
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End point timeframe:

Diagnosis of malaria infection following challenge as defined as positive thick film microscopy up to day 21 post challenge.

Notes:

[1] - No statistical analyses have been specified for this primary end point. It is expected there is at least one statistical analysis for each primary end point.

Justification: Due to the confidential nature of this information, we have not provided this analysis at this time. The publication will be uploaded at a later date.

End point values	Group 1	Group 2	Group 3	Group 4
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	13	13	1	6
Units: 33	13	13	1	6

Statistical analyses

No statistical analyses for this end point

Adverse events

Adverse events information^[1]

Timeframe for reporting adverse events:

AEs collected and reviewed from day of vaccination to 90 days post challenge (total 160 days).

SAEs reported within 24 hours of awareness to sponsor.

SUSARs reported within 15 days of awareness (7 days for fatal or life threatening events).

Assessment type	Systematic
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Dictionary used

Dictionary name	None
Dictionary version	N/A

Frequency threshold for reporting non-serious adverse events: 1 %

Notes:

[1] - There are no non-serious adverse events recorded for these results. It is expected that there will be at least one non-serious adverse event reported.

Justification: Due to the confidential nature of this information, we have not provided this data at this time. The publication will be uploaded at a later date.

There were a total of 3 SAEs, none of which were related to any of the IMPs or challenge procedures.

More information

Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? Yes

Date	Amendment
21 February 2013	Addition of electrocardiogram as a study procedure. Change of timing of post-vaccination follow-up visit. Corrections to the VIS to match the protocol. Addition of emergency contact cards. Shelf life extension of MVA CS lot 0010210.
25 March 2013	Change of diary card.
20 May 2013	Change to the protocol for day 7 post-CHMI visit Amendment to the phrasing used regarding the day 7 follow up visits after the controlled human malaria infection (CHMI) procedure. The protocol stated that volunteers will be seen for blood tests 3 times on the day, with a gap of 6-8 hours between each visit. This was not possible in practice, and therefore the phrasing was changed to 'The interval between visits will be as evenly spaced as practicable'.
31 May 2013	To extend the shelf life of vaccine ChAd63 CS (Batch No 03O11-01) for a further year to 16th June 2014. To extend the shelf life of vaccine AdCh63 AMA1 (Lot 01 Fill 09-04) for a further year to 17th June 2014.
17 July 2013	To extend the shelf life of vaccine MVA AMA1 to 3rd August 2014.

Notes:

Interruptions (globally)

Were there any global interruptions to the trial? No

Limitations and caveats

None reported