

# A programme to develop a skin patch containing two medicines (physostigmine and hyoscine), study 4: Assessment of blood levels of the two medicines and any associated symptoms in healthy male participants with Fitzpatrick Grade 5 skin pigmentation.

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| <b>Submission date</b><br>31/10/2019   | <b>Recruitment status</b><br>No longer recruiting                     | <input type="checkbox"/> Prospectively registered    |
|  |   | <input type="checkbox"/> Protocol                    |
| <b>Registration date</b><br>05/11/2019 | <b>Overall study status</b><br>Completed                              | <input type="checkbox"/> Statistical analysis plan   |
|  |   | <input type="checkbox"/> Results                     |
| <b>Last Edited</b><br>01/11/2019       | <b>Condition category</b><br>Injury, Occupational Diseases, Poisoning | <input type="checkbox"/> Individual participant data |
|  |   | <input type="checkbox"/> Record updated in last year |

## Plain English summary of protocol

### Background and study aims

A skin patch containing two medicines (physostigmine and hyoscine) has been developed. The skin patch releases these medicines enabling them to cross the skin into the bloodstream. The aim of this study was to measure the amount of physostigmine and hyoscine in the blood at different times, and assess any associated symptoms. The participants in the study were healthy male subjects with specific skin pigmentation

### Who can participate?

Study participants were healthy males aged between 18 and 45 years with specific skin pigmentation

### What does the study involve?

Each participant wore a transdermal patch for 72 hours on two different occasions separated by at least a week. On one occasion they wore a patch containing physostigmine and hyoscine, while on the other occasion they wore a placebo patch. Blood samples were taken before and after patch application to measure the amounts of the two medicines (physostigmine and hyoscine). In addition, the activity of the enzyme acetylcholinesterase (AChE) was measured in these blood samples. The condition of the skin under the patch was recorded at set times and any symptoms experienced while it was worn were noted. Heart rate, blood pressure, the electrical activity of the heart (ECG), tests of vision and cognitive function were also recorded at set times

### What are the possible benefits and risks of participating?

There were no direct individual benefits for the participants participating. However, the

information collected from these individuals added to the scientific knowledge about the physostigmine and hyoscine patch. All medicinal products have a risk of causing side effects. The most common side effects known about the medicines in the patch are nausea and vomiting due to physostigmine and blurred vision and dry mouth due to hyoscine. Overall the patch used was considered to be well tolerated

Where is the study run from?

The study was conducted at Simbec Research Limited

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

February 2006 to April 2007

Who is funding the study?

The study was funded by UK MoD

Contact details:

Defence Science and Technology Laboratory, Porton Down  
centralenquiries@dstl.gov.uk

## Contact information

**Type(s)**

Public

**Contact name**

Dr Medical Advisor

**Contact details**

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## Additional identifiers

**Clinical Trials Information System (CTIS)**

2005-005492-15

**ClinicalTrials.gov (NCT)**

Nil known

**Protocol serial number**

RD 209/24241

## Study information

**Scientific Title**

A Randomised, Double-Blind, Placebo-Controlled, Crossover Study to Investigate the Safety, Tolerability, Pharmacokinetics and Pharmacodynamics of a Single Application of a Transdermal Patch Formulation of Hyoscine and Physostigmine in Healthy Male Subjects with Pigmented Skin of Grade 5 on the Fitzpatrick Skin Scale

### **Study objectives**

The aim of this study was to investigate the safety, tolerability, pharmacokinetics and pharmacodynamics of single and multiple applications of a transdermal patch (21cm<sup>2</sup> area) in healthy male subjects with Fitzpatrick Grade 5 skin pigmentation

### **Ethics approval required**

Old ethics approval format

### **Ethics approval(s)**

Approved 16/02/2006, South East Wales Local Research Ethics Committees (LREC) (Churchill House, 17 Churchill Way, Cardiff, CF10 2TW; +44 (0)2920402402), ref: 06/WSE/04/13

### **Study design**

Single centre randomized double-blind placebo-controlled 2-part crossover study

### **Primary study design**

Interventional

### **Study type(s)**

Other

### **Health condition(s) or problem(s) studied**

Potential risk of poisoning by nerve agent

### **Interventions**

Generic drug name: physostigmine and hyoscine (transdermal patch)

Dosage: a single active or placebo 21cm<sup>2</sup> patch formulation F-11.

Method and frequency of administration: a single dose of either active or placebo patch formulation F-11 was worn for 72 hours.

Randomisation: a sequential three-digit subject (randomisation) number was assigned once eligibility for the study was confirmed. Subjects were randomised to receive one of the two IMPs in Period 1 and the alternative in Period 2. Treatment was allocated according to the randomisation schedule produced by the CRO.

### **Intervention Type**

Drug

### **Phase**

Phase I

### **Drug/device/biological/vaccine name(s)**

Physostigmine and hyoscine (transdermal patch)

### **Primary outcome(s)**

The safety and tolerability of a single application of physostigmine/hyoscine transdermal patch formulation was assessed by monitoring vital signs, ECG, ocular function (near point), patch application site assessment, using digital photography. These parameters were measured at baseline and at pre-determined intervals up to 96 hours after patch application and at follow up

### **Key secondary outcome(s)**

Pharmacokinetic (PK) and pharmacodynamic (PD) profiles were measured at regular time points at screening, pre-dose and up to 96 hours after patch application. Physostigmine and hyoscine plasma levels were measured by liquid chromatography-tandem mass spectrometry (LC-MS-MS) method. Acetylcholinesterase levels measured by validated spectrophotometric method

### **Completion date**

23/04/2007

## **Eligibility**

### **Key inclusion criteria**

Screening:

1. Ability to give written informed consent prior to study participation
2. Healthy male subjects with pigmented skin of Grade 5 on the Fitzpatrick skin scale
3. Aged between 18 and 45 years (inclusive)
4. Body Mass Index (BMI) within the range of 21 and 30 kg/m<sup>2</sup>
5. Vital signs within the following ranges:
  - 5.1. Pulse rate 40-90 bpm
  - 5.2. Systolic blood pressure 90- 150 mmHg
  - 5.3. Diastolic blood pressure 50- 95 mmHg
6. Ability to communicate well with the Investigator and to comply with the requirements of the study

Baseline Period 2:

1. Successful completion of Period 1
2. Willingness to continue in the study

### **Participant type(s)**

Healthy volunteer

### **Healthy volunteers allowed**

No

### **Age group**

Adult

### **Lower age limit**

18 years

### **Sex**

Male

### **Key exclusion criteria**

**Screening:**

1. Presence of any clinically significant medical condition as determined by the Investigator
2. Any surgical or medical condition which might have significantly altered the absorption, distribution, metabolism or excretion of any drug (e.g. renal or liver disease, respiratory, immunological, endocrine or neurological disorders)
3. Any ECG abnormality (sinus bradycardia and respiratory sinus arrhythmia are considered to be normal findings in healthy young adults)
4. Known or suspected hypersensitivity or idiosyncratic reaction related to any of the study products
5. Any history of contact dermatitis
6. A dibucaine number of less than 70
7. Skin disorders, broken skin, scars or tattoos that were extensive enough to obscure the patch application sites on both arms
8. Glaucoma or a history of glaucoma in first degree relatives (i.e. parents, siblings or offspring)
9. Presence of Anterior Chamber Narrow Angle (Van Herrick Grade 1 and 2)
10. Intra-ocular pressure exceeding 20 mm Hg
11. Uncorrected vision in both eyes of worse than 6/9 on the Snellen Scale
12. Required glasses or contact lenses for distance vision
13. History of asthma (within the previous 10 years), exercise induced bronchospasm or relevant seasonal bronchospasm
14. Lung function of less than 80% of predicted FEV1 and FVC values.
15. History or evidence of drug abuse (opiates, methadone, cocaine, amphetamines, methamphetamines, cannabinoids, barbiturates)
16. Positive test for HIV, Hepatitis B or Hepatitis C
17. History or evidence of alcohol abuse defined as an intake of more than 28 units per week (4 units per day), where 1 unit corresponds to 250 ml beer, 20 ml spirits/liqueur or one glass (100 ml) of wine
18. Positive urine test for alcohol
19. Participation in another clinical study within the previous three months
20. Use of any prescription medication within the previous 14 days
21. Use of non-prescription medication within the previous seven days (apart from paracetamol)
22. Donation of blood or blood products within the previous three months, or the intention to donate blood or blood products within three months after completion of the study

**Date of first enrolment**

14/02/2006

**Date of final enrolment**

07/06/2006

**Locations****Countries of recruitment**

United Kingdom

Wales

**Study participating centre**

**Simbec Research Limited**  
Merthyr Tydfil  
United Kingdom  
CF48 4DR

## Sponsor information

### Organisation

Defence Science Technology Laboratory (Dstl)

### ROR

<https://ror.org/04jswqb94>

## Funder(s)

### Funder type

Government

### Funder Name

Study conducted on behalf of UK Ministry of Defence

## Results and Publications

### Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are not expected to be made available due to confidentiality

### IPD sharing plan summary

Not expected to be made available

### Study outputs

| Output type                                   | Details                       | Date created | Date added | Peer reviewed? | Patient-facing? |
|---|-------------------------------|--------------|------------|----------------|-----------------|
| <a href="#">Participant information sheet</a> | Participant information sheet | 11/11/2025   | 11/11/2025 | No             | Yes             |