ISRCTN15529655 https://doi.org/10.1186/ISRCTN15529655

# Melatonin in doctors and nurses working nightshifts

| Submission date | Recruitment status | [X] Prospectively registered |
|---|---|---|
| 19/02/2016 | No longer recruiting | [X] Protocol |
| **Registration date** | **Overall study status** | [_] Statistical analysis plan |
| 22/02/2016 | Completed | [X] Results |
| **Last Edited** | **Condition category** | [_] Individual participant data |
| 12/08/2022 | Other | |

## Plain English summary of protocol

Background and study aims
Melatonin is a hormone produced by the brain that controls sleeping patterns. Levels peak at around 4am, and when night shift workers attempt to sleep in the daytime when melatonin levels are low, a ‘mismatch’ between melatonin levels and timing of sleep occurs. It takes several days to adapt. A ‘transcriptome’ is a collection of RNA molecules produced by a particular cell or tissue. The transcriptome can vary with the external environment, and changes in the transcriptome can tell us a lot about gene activity. Recent studies have shown that when there is a mismatch between melatonin production and sleep patterns, there are changes in the transcriptome. Night shift working has been associated with adverse health effects, which might be related to transcriptome changes. Poorer performance and alertness has been reported in night shift workers and this continues until the timing of melatonin production has changed to match sleeping patterns. Administration of melatonin has been used previously in ‘jet lag’, which is a similar situation to that of night shift workers. However, it is unknown whether taking a dose of melatonin affects transcriptome changes or if it helps sleeping patterns and work performance to recover quicker. Melatonin has an excellent safety profile and may be used as a new treatment to improve sleep patterns, improve performance and possibly correct the adverse health effects of night shift working. The aim of this study is to determine the effects of giving doses of melatonin in medical staff working night shifts, and to assess whether melatonin given before sleep time is able to improve sleep, improve alertness and affect transcriptome changes.

Who can participate?
Doctor and nurses working two series of night shifts at least 4 weeks apart

What does the study involve?
Each participant is studied twice - during one series of night shifts they take melatonin and during the other series of night shifts they take a placebo (dummy drug). The order in which they take melatonin or placebo is decided randomly. They complete questionnaires about their normal sleeping habits, their sleeping patterns during the night shift and how sleepy they feel. Participants' alertness is assessed using a computer reaction test and blood samples are taken to measure transcriptome changes. Participants also wear a wristband monitor during sleep periods to obtain data on their sleeping patterns and restlessness.

What are the possible benefits and risks of participating?
The study will tell us whether melatonin might help people undertaking night shifts adapt more quickly to a new sleeping pattern and whether taking melatonin affects the transcriptome changes which have been previously described, which may improve adverse health outcomes.

Where is the study run from?
University of Aberdeen/NHS Grampian (UK)

When is the study starting and how long is it expected to run for?
April 2016 to March 2018

Who is funding the study?
Chief Scientist Office

Who is the main contact?
Prof Helen Galley

# Contact information

### Type(s)
Scientific

### Contact name
Prof Helen Galley

### ORCID ID
http://orcid.org/0000-0002-9517-0074

### Contact details
Institute of Medical Sciences
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# Additional identifiers

### EudraCT/CTIS number
2015-004106-42

### IRAS number

### ClinicalTrials.gov number

### Secondary identifying numbers
3-047-15

# Study information

### Scientific Title

Melatonin In Doctors and nurses working NIGHTshifts (MIDNIGHT): a randomised double-blind placebo-controlled crossover pilot study

## Acronym
MIDNIGHT

## Study objectives
The aim of this pilot study is to determine the effects of exogenous melatonin administration compared with placebo in medical staff working night shifts on the intensive care unit.

## Ethics approval required
Old ethics approval format

## Ethics approval(s)
North of Scotland research ethics committee 2, 17/02/2016

## Study design
Randomised double-blind placebo-controlled crossover pilot study

## Primary study design
Interventional

## Secondary study design
Randomised cross over trial

## Study setting(s)
Hospital

## Study type(s)
Quality of life

## Participant information sheet
Not available in web format, please use the contact details below to request a patient information sheet

## Health condition(s) or problem(s) studied
Doctors and nurses working nightshifts

## Interventions
Subjects will take 6mg Circadin (slow release melatonin) or a matching placebo on three consecutive days during night shift working on two separate series of night shifts at least 4 weeks apart.

## Intervention Type
Drug

## Phase
Phase II

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

Circadin (melatonin)

### Primary outcome measure
The primary endpoint is successful completion of the trial, defined as recruitment, randomisation and protocol completion of 25 individuals i.e., both arms of the crossover design.

### Secondary outcome measures
1. Determination of drop out, non completion and retention rate (end of trial)
2. Differential gene expression (blood samples on Day 1 before shift, and end of shifts series on Day 4)
3. Differential gene expression between placebo and active arms (blood samples Day 4 after each shift series)
4. Serum interleukin-6 and tumour necrosis factor alpha levels (blood samples on Day 1, and end of shifts series on Day 4)
5. Serum IL-6 and TNFalpha levels after placebo and active arms (blood samples Day 4 after each shift series)
6. Serum melatonin and 6-hydroxymelatonin sulphate levels at each time point (blood samples on Day 1 before shift, and end of each shift for shift series)
7. Verran and Snyder-Halpern sleep scale, Epworth sleepiness scale, data from wristband activity monitor (VSH before each shift, ESS before, during and after each shift. Activity monitoring during each sleep period)
8. Psychomotor vigilance task, double digit addition test (PVT and DDAT before and after each shift)
9. Usual sleep habits and owl-lark questionnaires (before randomisation)
10. Questionnaire about trial (trial end)
11. Focus group about trial (trial end - requires additional consent)

### Overall study start date
01/04/2016

### Completion date
30/03/2018

## Eligibility

### Key inclusion criteria
1. Either sex
2. Non-smokers
3. Not taking regular medicine
4. No health complaints
5. Doctor or nurse working two series of night shifts at least 4 weeks apart

### Participant type(s)
Health professional

### Age group
Adult

### Sex
Both

### Target number of participants
32

### Total final enrolment
25

### Key exclusion criteria
1. Pregnant or trying to get pregnant
2. Breastfeeding
3. Use of sedatives, hypnotics, herbal remedies, sleeping pills
4. Taking medication except oral contraceptives

### Date of first enrolment
01/04/2016

### Date of final enrolment
30/08/2017

## Locations

### Countries of recruitment
Scotland

United Kingdom

### Study participating centre
**University of Aberdeen/NHS Grampian**
Research Governance Office
Foresterhill House Annexe
Foresterhill
Aberdeen
United Kingdom
AB25 2ZB

## Sponsor information

### Organisation
University of Aberdeen/NHS Grampian (UK)

### Sponsor details
Research Governance Office
Foresterhill House Annexe
Foresterhill
Aberdeen
Scotland

United Kingdom
AB25 2ZB

**Sponsor type**
University/education

**ROR**
https://ror.org/016476m91

# Funder(s)

**Funder type**
Government

**Funder Name**
Chief Scientist Office

**Alternative Name(s)**
CSO

**Funding Body Type**
Government organisation

**Funding Body Subtype**
Local government

**Location**
United Kingdom

# Results and Publications

**Publication and dissemination plan**
Not provided at time of registration.

**Intention to publish date**
30/03/2019

**Individual participant data (IPD) sharing plan**
Not provided at time of registration

**IPD sharing plan summary**
Not expected to be made available

**Study outputs**

| Output type | Details | Date created | Date added | Peer reviewed? | Patient-facing? |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Basic results | | 12/03/2019 | | No | No |
| Results article | results | 27/08/2020 | 17/11/2020 | Yes | No |
| Protocol file | version 4.0 | 16/06/2016 | 12/08/2022 | No | No |