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Study comparing the response of psoriasis to narrow-band UVB phototherapy in the morning and afternoon

Submission date
16/03/2020

Recruitment status
Suspended

Registration date
23/04/2020

Overall study status
Completed

Last Edited
23/04/2020

Condition category
Skin and Connective Tissue Diseases

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
Psoriasis is a skin condition that causes red, flaky, crusty patches of skin covered with silvery scales. The aim of this study is to determine whether the response of psoriatic skin to ultraviolet (UV) phototherapy shows daily variation and differs between the morning and the afternoon. This will be done by evaluating the skin's response after a single dose of UV phototherapy at defined time points (morning and afternoon). It is thought that phototherapy in the afternoon will lead to a greater response. Such a finding would form the basis of a clinical study to test whether phototherapy in the afternoon is more effective than in the morning and would also have implications for the delivery of other forms of psoriasis therapy.

Who can participate?
Patients aged 18 and over with psoriasis requiring phototherapy treatment

What does the study involve?
Each patient will complete questionnaires about sleep quality and depression. Blood will be taken at the start of the study for storage and for future analysis. Participants will be given containers for urine and saliva samples, to be returned at the final appointment. Participants will have a morning and afternoon appointment for 3 days. On the first day, their skin’s sensitivity to ultraviolet light will be measured. The following day this testing will be completed, and based on this result UV light will be applied to the patient’s skin. On the final day a small biopsy will be taken from the treated skin and from a similar area of skin without phototherapy exposure. Skin biopsies (samples) will be assessed for skin turnover and UV light sensitivity. After this patients will proceed to their prescribed course of phototherapy.

What are the possible benefits and risks of participating? PM:
There is no immediate potential for benefit for participants. The results of this study may affect subsequent UVB treatment courses for all patients. Standard UVB phototherapy can cause redness to normal (non-psoriatic) skin, but lesional psoriasis does not burn even with very high doses of UVB (up to 10 times the minimal erythema dose). As such, psoriatic plaques will suffer no side effects of UV phototherapy, but normal skin may become inflamed. To minimise this a

lowered dose of UVB phototherapy will be applied to skin outside of plaques. The redness will require no treatment. Taking a blood sample may cause a small bruise and can be painful. The bruising should not require any treatment and will improve on its own. Patients will be able to take painkillers such as paracetamol before their appointment to reduce pain. Biopsies can bleed, but patients will be advised this will stop with the application of firm and continuous pressure to the area for 5-10 minutes. An anaesthetic will be given to reduce the pain of the biopsy procedure but the patient may take paracetamol after to help with pain symptoms. Biopsies are carried out in a surgical setting and will be dressed properly to minimise the risk wound infection. Patients will be advised to keep the dressing dry and clean. Biopsies leave a small scar, which tends to fade with time - patients will be told about this as part of the informed consent process. Every effort will be made to make the scar as cosmetic as possible.

Where is the study run from?
Royal Victoria Infirmary (UK)

When is the study starting and how long is it expected to run for?
April 2016 to October 2020, but this is likely to be extended

Who is funding the study?
1. British Skin Foundation (UK)
2. North East Skin Research Fund (UK)
3. Psoriasis Association (UK)

Who is the main contact?
Prof. Nick Reynolds
nick.reynolds@ncl.ac.uk

Contact information

Type(s)
Scientific

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Additional identifiers

Integrated Research Application System (IRAS)
206401

Central Portfolio Management System (CPMS)
35525

Study information

Scientific Title
A pilot study to compare the response of psoriasis to narrow-band UVB phototherapy in the morning and afternoon (Psoriasis and the Circadian Timing System [Version 1])

Study objectives
Psoriasis is a common skin disease. Research has shown that skin undergoes cyclical variation in cell division and sensitivity to ultraviolet light. This study has been constructed to determine if this is the case in patients with psoriasis.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 01/08/2017, North East - Tyne & Wear South Research Ethics Committee (NHSBT Newcastle Blood Donor Centre, Holland Drive, Newcastle upon Tyne, NE2 4NQ, UK; +44 (0)207 104 8084, +44 (0)207 104 8265; tyneandwearsouth.rec@hra.nhs.uk), REC ref: 17/NE/0247

Primary study design
Interventional

Study design
Randomised; Interventional; Design type: Treatment, Diagnosis, Process of Care, Device, Management of Care, Active Monitoring

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Psoriasis

Interventions
30 patients will be recruited to the study in two groups of 15. All patients will have psoriasis and have routinely been prescribed narrowband UVB treatment for this. Patients will be recruited directly from clinic or from the phototherapy unit at a single tertiary referral centre (the Royal Victoria Infirmary, Newcastle upon Tyne). One group of patients will be assessed for the response of psoriatic plaques to UVB, and the other will be assessed for the response of uninvolved skin (an area without a plaque) to UVB (at a lower dose).

Initially, prospective participants will be identified in clinic and be given an information sheet if potentially interested in the study. At this time, an appointment will be scheduled with enough time for the patient to reflect on the study between visits.

The six appointments are divided into a morning appointment and an afternoon appointed for three consecutive days.

Day 1
At this first appointment, there will be the opportunity for any questions to be answered and if the patient is agreeable and meets all entry criteria, informed consent will be taken. Demographic and clinical data (such as age, gender, and psoriasis severity) will be recorded. The participant will complete sleep and depression questionnaires, and blood samples will be taken and stored for future analysis of biomarkers that affect psoriasis. Participants will then have their minimal erythema dose (MED) tested. This is a two-stage assessment that determines how much phototherapy is applied to the participant's skin based on their individual sensitivity to UV light. On the first day a range of doses of UV will be applied to an unaffected region of skin on the participant's back.

MED testing will also be carried out in the afternoon of the first day. To finish their afternoon appointment participants will be shown how to provide a saliva sample and be given salivettes for this. They will also be given universal containers for urine samples.

Day 2
In the morning appointment for the second day, the morning MED testing will be completed by looking for the area of skin, to which UV radiation was applied, that has the least amount of perceptible redness. The dose of UV light that caused this redness is termed the minimal erythema dose. MED testing will also be completed in the afternoon appointment. MED testing is a requirement for phototherapy, and is part of routine practice. The researchers will also use an erythema meter to quantify the amount of redness created by the UV light. One group of participants will then have three times this dose applied to the edge of a plaque of psoriasis on the back in the morning visit and also the afternoon visit (please note that psoriasis is resistant to UV light and can withstand up to 8 MEDs without burning). The other group of participants will have 1 MED applied to a small area of skin with no psoriatic plaques at the two time points.

Day 3
A small punch biopsy of skin will be taken from the area of skin that received UV light the previous day (either psoriatic plaque or uninvolved skin). This will be at both time points, and a second biopsy will be taken from an area of matched skin that had not received UV light the previous day. In this way, participants will each provide four biopsies. On the afternoon appointment, the participant will return all urine and saliva samples.

After this the participant will go on to have their prescribed course of phototherapy. Their psoriasis severity will be monitored during this and upon completion (as is routinely done). The researchers will call each month for the 6 months after completion of the course of phototherapy to ask if their psoriasis continues to be under control.

The study ends when the last participant has completed the follow-up.

Intervention Type
Procedure/Surgery

Primary outcome(s)

Rate of apoptosis in skin biopsies, measured by manual and automated counts of histology slides at 24 hours after irradiation with narrowband UVB light (day 3)

Key secondary outcome(s)
1. Minimal erythema dose (that is, comparing the skin's sensitivity to UV in the am and pm) measured visually, in line with current clinical practice, with the aid of an erythema meter, at 24 hours after test irradiation (day 2))
2. Salivary cortisol levels in patients with psoriasis and associated circadian rhythm dysfunction, measured by ELISA at the following timepoints on days 1, 2 and 3: waking, 0900, 1600, before sleep
3. Urinary melatonin levels in patients with psoriasis and associated circadian rhythm dysfunction, measured by ELISA from an early morning urine sample on days 2 and 3
4. Sleep quality measured by Pittsburgh Sleep Quality Index and Morningness-Eveningness Questionnaire at baseline
5. Symptoms of anxiety and depression measured with the Dermatology Life Quality Index, Hospital Anxiety and Depression Scale and Patient Health Questionnaire-9 at baseline

Completion date
31/10/2020

Eligibility

Key inclusion criteria
1. At least 18 years of age
2. Able to speak English
3. Able to provide written informed consent
4. Have chronic plaque psoriasis
5. Prescribed NbUVB phototherapy
6. Able and willing to attend the phototherapy department regularly

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Sex
All

Key exclusion criteria
1. Able to control their psoriasis or already controlled by topical therapy
2. Pregnant
3. Significant sun exposure, sun-bed use or previous NbUVB within the last month or be planning significant sun exposure or sun-bed use in the next month

4. Previously taken, in the last three months any of the following: methotrexate, azathioprine, ciclosporin, biological therapy or systemic steroids for treatment of psoriasis
5. Previously taken, in the last month, any oral photosensitising medications, including: thiazide diuretics, antibiotics such as tetracyclines and quinolones, non-steroidal anti-inflammatory drugs, phenothiazines, retinoids, sulphonylureas, quinine and St John's Wort
6. Also suffer from diseases where phototherapeutic treatment is contraindicated: xeroderma pigmentosum, lupus erythematosus
7. Work night-shifts
8. Diagnosed circadian rhythm disorder

Date of first enrolment
04/12/2017

Date of final enrolment
30/08/2020

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Royal Victoria Infirmary
Queen Victoria Road
Newcastle upon Tyne
United Kingdom
NE1 4LP

Sponsor information

Organisation
Newcastle upon Tyne Hospitals NHS Foundation Trust

ROR
https://ror.org/05p40t847

Funder(s)

Funder type
Charity

Funder Name
British Skin Foundation; Grant Codes: 001/BPG.SG/17

Alternative Name(s)
The British Skin Foundation, bsfcharity, BSF

Funding Body Type
Private sector organisation

Funding Body Subtype
Trusts, charities, foundations (both public and private)

Location
United Kingdom

Funder Name
Psoriasis Association

Alternative Name(s)
The Psoriasis Association, Psoriasis UK

Funding Body Type
Government organisation

Funding Body Subtype
Associations and societies (private and public)

Location
United Kingdom

Funder Name
North East Skin Research Fund

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be stored in a non-publically available repository, the Newcastle University secured server. Data will be available upon request to Prof. Nick Reynolds (nick.reynolds@ncl.ac.uk).

IPD sharing plan summary

Study outputs

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

HRA research summary	28/06/2023	No	No