Visibility of standardized induced bruises under forensic light source compared to white light source.

Published: 27-07-2016
Last updated: 19-04-2024

To assess visibility of standardized induced bruises using imaging (photography) under white light, forensic light sources, and multispectral scanning, at set time intervals.To gain understanding in the influence of individual factors on bruising.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Administration site reactions
Study type	Interventional

Summary

ID

NL-OMON43794

Source
ToetsingOnline

Brief title
Visibility of bruises under forensic light source and filters.

Condition

- Administration site reactions

Synonym
bruise, hematoma

Research involving
Human

Sponsors and support

Primary sponsor: Nederlands Forensisch Instituut (NFI)
Source(s) of monetary or material Support: NFI;is onderdeel van Ministerie van Veiligheid en Justitie

Intervention

Keyword: blunt force trauma, bruises, forensic light source, multispectral imaging, visibility

Outcome measures

Primary outcome

The visibility of bruising on the site of impact (with artificial light and

forensic light source) and multispectral imaging.

Secondary outcome

Individual factors of the participants in relation to obtain a bruise and the

visibility of the bruise.

Study description

Background summary

Medical forensic experience indicates that visibility of bruises may be improved when illuminated using forensic light sources.
However, limited research on this issue has so far been performed and validation of this method is absent.
Forensic light sources are often utilized by police investigators and forensic physicians, but usage can be increased when usage is scientifically proven.
Investigation into the visualisation of bruises using the standard equipment used by forensic experts, photography with white light and 415 nm illuminations, supported by the information from multispectral imaging at wavelengths dedicated for the detection and analysis of bruises could potentially result in an improvement of the visualisation of bruises.
Additionally, photography at the dedicated wavelengths can be used to give more information about the development and age of a bruise. Information on the development and healing of bruises can help to validate current and develop future models for the age determination of bruises (Stam et al, 2011).

Study objective

To assess visibility of standardized induced bruises using imaging (photography) under white light, forensic light sources, and multispectral scanning, at set time intervals.

To gain understanding in the influence of individual factors on bruising.

Study design

Healthy NFI-employees are asked to participate in the study by using flyers that will be hung in the NFI building.

To induce bruises by a standardized blunt impact, a cylindrical metal object of 400 grams with rounded edges is dropped at random for 1 meter down a tube halfway on the flexor side of the forearm.
(slightly adjusted method of Lombardi M, Canter J et al: Is fluorescence under an alternate light source sufficient to accurately diagnose subclinical bruising? J Forensic Sci 2015; doi 10.1111/1556-4029.12698).

Impact sites are photographed using a standard DSLR camera when illuminated with artificial white light (3900K), forensic light (415 nm) sources, and with a multispectral camera at 8 wavelengths (450, 480, 509, 542, 558,578,620 and 850 nm) under illumination of a halogen light. Photographing is done before and after impact, and at 6 hours, and 1, 2, 7, 14 and 21 days after impact (as long as a bruise, with either method, is visible).

Each participant will fill in a questionnaire at the beginning of the research. This form will contain questions about age, gender, sport activities and medication. Measurements of the forearm will be taken (circumference, point of centre, and thickness of the skin at the point of impact. This information will be compared with the presence or absence of a bruise.

Assessment of bruise visibility will be performed by the researcher by making paired comparisons of coded photographs. Development of the bruise and the healing process will be analysed based on the change in size of the area containing higher concentration of haemoglobin and bilirubin. The photographs obtained with the multispectral camera are selected for the detection of these chromophores. Spectral analysis will be performed to determine the change in size of the haemoglobin and bilirubin area.

Intervention

see above

Study burden and risks

Burden and risk in this research will be minimal. The weight of the cylindrical object is based on other studies. In none of these studies severe injuries were seen.
In our preliminary study (N=60) no adverse effects were seen:

Moderate pain at site of impact, during maximum 1 week.
Mean pain score after impact, in preliminary study: 3 out of 10.

Contacts

Public
Nederlands Forensisch Instituut (NFI)

Laan van Ypenburg 6
Den Haag 2497GB
NL
Scientific
Nederlands Forensisch Instituut (NFI)

Laan van Ypenburg 6
Den Haag 2497GB
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

healthy volunteers, employee of the NFI

Exclusion criteria

skin disorder on side of impact (=halfway ventral side forearm), bleeding disorder

Study design

Design

Study type: Interventional

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Diagnostic

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	17-10-2016
Enrollment:	107
Type:	Actual

Ethics review

Approved WMO Date:	27-07-2016
Application type:	First submission
Review commission:	METC Amsterdam UMC
Approved WMO Date:	11-10-2016
Application type:	Amendment
Review commission:	METC Amsterdam UMC

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL53398.018.15