The Neurobiological Mechanisms of Resilience to Stress

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The objective of the study is to examine characteristics in brain function, structure, hormonal response, genetic makeup and heart rate variability specific for resilience to stress

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Psychiatric disorders NEC
Study type	Interventional

Summary

ID

NL-OMON39460

Source
ToetsingOnline

Brief title
NEMRES

Condition

- Psychiatric disorders NEC

Synonym
anxiety, depression, post-traumatic stress disorder), stress-related disorders (i.e.

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum
Source(s) of monetary or material Support: NIHC

Intervention

Keyword: neuroimaging, Police, Resilience, Stress

Outcome measures

Primary outcome

The main study parameters are the differences in the brain activation patterns,

brain structure, hormone response and genetic makeup between resilient

individuals, vulnerable individuals and healthy controls.

Secondary outcome

N/A

Study description

Background summary

The association between stress and the development of a psychopathology is an extensively studied research topic. A specific type of stressor, which has been known to cause psychopathologies like depression, anxiety disorder and posttraumatic stress disorder (PTSD), is the traumatic experience. Statistics show that not every individual that experienced a traumatic event will develop psychopathology. This study aims to investigate the relationship between neural functioning, brain structure, hormone response, genetic makeup and heart rate variability and resilience for stress.

Study objective

The objective of the study is to examine characteristics in brain function, structure, hormonal response, genetic makeup and heart rate variability specific for resilience to stress

Study design

This study will use a case-control design with three groups. Participants* brain volume will be measured using a structural magnetic resonance imaging (MRI) technique. Resting State brain activation patterns will be measured using functional MRI (fMRI), which will also be used for measuring event related brain activation during a social stress task (the MIST), during an emotional working memory task (the Emotional Sternberg Task) and during an implicit emotion regulation task. Finally, diffusion tensor imaging (DTI) will be used to measure structural connectivity. Due to the length of the scanprotocol,

scanning will take place on two different moments. In addition to the scanprotocol, participants will be asked to complete behavioural, cognitive and emotion-related questionnaires. Hormonal responses and DNA will be isolated from saliva samples.

Functional MRI Tasks:
The Montreal Imaging Stress Task (MIST): a series of mental arithmetic challenges, which will increase in difficulty as performance goes up. Participants will think they are performing below average. In addition a social evaluative component is added by negative remarks coming from the investigator.
Emotional Sternberg task: Participants are presented with targets followed by either an emotional or neutral distracter, followed by a recognition phase in which they are required to recognize the presented targets.
Implicit emotion regulation: Participants are asked to react to the emotional expression of shown faces. On top of these faces the names of emotions are printed. Trials are either congruent or incongruent. Reaction time on each trial is measured to compose a measure for emotion regulation

Intervention

N/A

Study burden and risks

MRI is a fairly safe, non-invasive measuring technique, which involves no catheterizations or introduction of exogenous tracers. However, there are a few contraindications for participating in a MRI scan. The MRI scanner is basically a large magnet in which the individual has to take place; the scanner is shaped like a small tunnel. When measuring the brains, individuals have to lay head first in the tunnel, which can cause symptoms of claustrophobia. In these cases the study will be terminated immediately at the request of the individual. Other contraindications of participating in the study are pregnancy, the possession of ferromagnetic foreign bodies in a participants* body, and the possession of a cardiac pacemaker. Although there is no direct benefit to the participants, the proposed research is expected to make a significant contribution to our understanding of the neural mechanisms of resilience to stress. In the end, this knowledge will prove very useful in the development of resilience enhancing interventions. Especially individuals that have a high risk of experiencing severe stressors, due to for instance their occupation, will benefit a lot from developing more resilience towards stress. To be able to investigate the differences between resilient and vulnerable individuals we need participants with psychopathologies. Due to the high comorbidity of phobias1 with other psychopathologies, the expectancy rate of individuals experiencing claustrophobia symptoms in the scanner is higher for the patient groups than it is for the healthy control group or the resilient group. However the participants all get a panic button and the researchers will abort the

study immediately after this button is pressed in order to keep participants* discomfort as low as possible. Furthermore, we will exclude subjects with claustrophobia. Large numbers of patients have already been scanned by our group for other protocols (i.e., NESDA)

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

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

Inclusion criteria

Trauma-related patients: participants meet criteria for stress-related psychopathology on the MINI-international neuropsychiatric interview (MINI), , and were exposed to multiple traumatic events according to scores on the Police Life Events Schedule (PLES)
Resilient group: Participants must have experienced multiple traumatic events according to the PLES and no history of psychopathologies according to the MINI
Control group: Participants must be clear from any current psychopathologies according to

the MINI and have none to low exposure to traumatic events according to the PLES
Inclusion criteria for all participants in general:
Absence of a history of neurological disorder/disease and an absence of counter-indications to MRI. All participants will be right-handed native Dutch speakers with normal vision or contact lenses.

Exclusion criteria

Potential participants will be screened for contraindications for fMRI, which include metal implants, heart arrhythmia, claustrophobia, and possible pregnancy. They will additionally be screened for head trauma, history of neurological or psychiatric illness and/or use of psychotropic medications. Finally, handedness will be assessed using the handedness scale. Predominantly Left-handed individuals will be excluded from the study because some left-handers have substantially different brain organization relative to right-handers.

Study design

Design

Study type:	Interventional
Intervention model:	Other
Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	31-01-2013
Enrollment:	105
Type:	Actual

Ethics review

Approved WMO

Date:	17-01-2013
Application type:	First submission
Review commission:	METC Leids Universitair Medisch Centrum (Leiden)

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	NL40761.058.12