BRAIN ASYMMETRY FOR EMOTIONAL PROSODY IN KLINEFELTER: CAUSAL RELATIONS INVESTIGATED WITH TMS

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The aim of the present experiment is to test whether the normally right-lateralised response to emotional prosody is reduced in KS.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Chromosomal abnormalities, gene alterations and gene variants
Study type	Observational non invasive

Summary

ID

NL-OMON33712

Source
ToetsingOnline

Brief title
The brain and emotional prosody in Klinefelter

Condition

- Chromosomal abnormalities, gene alterations and gene variants

Synonym
sex chromosome abnormality, XXY Karyotype

Research involving
Human

Sponsors and support

Primary sponsor: Academisch Medisch Centrum
Source(s) of monetary or material Support: 40004333

Intervention

Keyword: Brain asymmetry, emotional prosody, klinefelter, TMS

Outcome measures

Primary outcome

Patterns of brain activation

Reaction times and accuracy measures on language tasks

Secondary outcome

n.a.

Study description

Background summary

BRAIN ASYMMETRY FOR EMOTIONAL PROSODY IN KLINEFELTER: CAUSAL RELATIONS INVESTIGATED WITH TMS RELATIONS INVESTIGATED WITH TMS. Laterality of the human brain forms one of the most interesting asymmetries described in humans. However, little is known about the origin of these asymmetries (Geschwind, 1998). A genetic disorder that is associated with abnormal brain development and behavior is Klinefelter Syndrome (KS), characterised by the presence of an extra X chromosome in males (47, XXY karyotype). The phenotype of KS may include physical abnormalities such as tall stature, hypogonadism, infertility and gynecomastia and behavioural and cognitive abnormalities. Men with KS also have an increased risk of psychosis. However, difficulties in social interaction form one of the most disabling symptoms in Klinefelter men. It has been proposed that these problems in social communication can be explained by disabilities in the language domain (Rovet et al., 1996). Both left and right hemispheric language functions have been shown to be impaired in KS. Van Rijn and colleagues also found that men with KS show high levels of schizophrenia spectrum pathology (van Rijn et al., 2006a). Difficulties in social adaptation together with the structural brain abnormalities associated with the XXY karyotype, suggest that a genetic mechanism involving genes on the X chromosome might lead to disturbances in the development of social cognition in XXY men. Language and emotion form the corner stones of social cognition. Interestingly, for both language and emotion, functional asymmetries have been found. Most aspects of language, like semantics and syntax, are lateralized to the left

hemisphere in healthy subjects, while emotion is hypothesized to be mostly lateralized to the right hemisphere. Impairments in language processing have been reported in various studies on KS. Reduced or abnormal lateralization of language has also been found in Klinefelter syndrome (Geschwind, 1998; van Rijn et al., 2008). Impairments in emotional prosody perception have been reported in KS (van Rijn et al., 2007), but no studies have been done on the lateralization of this function.

Study objective

The aim of the present experiment is to test whether the normally right-lateralised response to emotional prosody is reduced in KS.

Study design

The hypothesis will be tested by means of transcranial magnetic stimulation (TMS) and functional magnetic resonance imaging (fMRI). To study the neural substrate of emotional prosody perception in men with KS, subjects will perform an emotional prosody task in the scanner. The results will give us information about the degree of lateralization in KS men. TMS is used to establish causal relations between processing in localized brain regions and emotional language processing. An area most consistently found to be crucial for emotional prosody perception is the superior temporal gyrus (STG) (Adolphs et al, 2002 ; (Beaucousin et al., 2007). The present study includes rTMS over not only the right STG but also the left STG, which allows conclusions regarding lateralization of: i) emotional prosody and emotional semantics, and ii) withdrawal and approach emotions. Our main question is wether the lateralizations of emotional prosody (and emotional semantics) are aberrant in KS as compared to healthy controls.

Study burden and risks

First we will phone the participants to inform them about the experiment, and check all in and exclusiecriteria.
We ask the participants to come twice.
Duration of the three sessions together will be around 330 minutes.
There are no risks in participating in our study.
No benefits.

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

Klinefelters:
diagnosis of Klinefelter
physically healthy
age between 18 and 55
controls: - male
- physically healthy
- age between 18- 55
- absence of DSM-IV axis I disorders, confirmed by Mini-SCAN interview

Exclusion criteria

- drug or alcohol dependence
- left-handedness or ambidexterity
- significant psychiatric or neurological conditions
- history of head injury with loss of consciousness
- metal in cranium
- epilepsy or family history of epilepsy

- cardiac pacemaker
- infarctions
- implanted medication pump
- intracardiac lines
- pregnancy
- claustrophobia

Study design

Design

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

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	22-07-2019
Enrollment:	32
Type:	Actual

Ethics review

Approved WMO

Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

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	NL23718.042.08