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Respiration and posture

Submission date	Recruitment status	[X] Prospectively registered
18/03/2016	No longer recruiting	[_] Protocol
Registration date	**Overall study status**	[_] Statistical analysis plan
09/10/2016	Completed	[X] Results
Last Edited	**Condition category**	[_] Individual participant data
12/02/2025	Respiratory	

Plain English summary of protocol

Background and study aims
Breathing causes the trunk (torso) and ribcage to move. In some cases, this movement can cause unsteadiness and changes in posture and gait (pattern of movement of the limbs while moving). In order to better understand the way that posture changes during breathing, this study will look at the mechanics of breathing and what effect this has on the way a person moves. The aim of this study is to find out whether posture is influenced by breathing and the mechanism by which this happens.

Who can participate?
Healthy French adults.

What does the study involve?
All participants attend a single study visit which takes around four hours. At the visit, the participant's posture is measured by taking a series of pictures taken using low dose x-rays while they are breathing calmly, after taking a deep breath and after breathing out fully in both sitting and standing positions. The participants then have 78 reflective markers attached to their whole body so that their motion can be monitored to assess their posture, and complete five different breathing patterns for one minute each in a standing position and then a sitting position. This involves quiet breathing with open eyes and mouth, closed eyes and open mouth, open eyes and closed mouth, closed eyes and mouth, and finally quiet breathing for 30 seconds with eyes open, followed by holding the breath for 10-15 sections and then deep breathing for 30 sections. Participants also take part in a walking test to measure their gait speed and have their lung volume measured by blowing into a machine called a spirometer.

What are the possible benefits and risks of participating?
There are no direct benefits or risks involved with participating in this study.

Where is the study run from?
1. Laboratoire de biomécanique humaine Georges charpak Arts et Métiers ParisTech (France)
2. Hôpital Pitié-Salpêtrière (France)

When is the study starting and how long is it expected to run for?
November 2014 to October 2019

Who is funding the study?
National School of Arts and Trades (France)

Who is the main contact?
Dr Valeria Attali
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Contact information

Type(s)
Scientific

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Additional identifiers

Clinical Trials Information System (CTIS)
2016-001243-39

Protocol serial number
06036

Study information

Scientific Title
Postural adaptations linked to respiration in healthy and in respiratory diseases

Study objectives
Posture is influenced by respiration.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Comité de Protection des Personnes Ile-de-France VI, 18/02/2015, ref: RCB 2006-A00386-45

Study design
Non-randomised study

Primary study design
Interventional

Study type(s)
Diagnostic

Health condition(s) or problem(s) studied
Respiratory diseases

Interventions
All participants attend a single study visit, which lasts for approximately four hours. Once a participant is deemed eligible and provides informed consent, participants undergo a range of medical examinations. There is no follow up planned after the study visit.

Angulations of posture are measured using the EOS® system. Six pairs of images will be done, three in sitting position (during calm breathing, after a full inspiration and after a full expiration) , three in standing position in the same conditions. This process takes approximately 30 minutes

Modification of centre of pressure is measured using a force platform on the floor. This involves the application of 78 reflective markers to the whole body, including 35 on the thorax and the abdomen. Motion capture is undertaken using an optoelectronic VICON system. Participants are instructed to perform five different breathing patterns for one minute each in standing position followed by sitting position. This process takes two hours. The breathing patterns are:
1. Quiet breathing with open eyes and mouth
2. Quiet breathing with closed eyes and open mouth
3. Quiet breathing with eyes open and closed mouth
4. Quiet breathing with eyes and mouth closed
5. Quiet breathing for 30 seconds with eyes open, followed by a very short apnea (10-20 seconds) and then deep breathing for 30 seconds

Gait velocity is measured using the stand up and go test. Subject is sitting on a chair and is instructed to stand up, to walk 3 metres, to return and to sit again. Velocity is measured. It takes less than 10 minutes

Lung volume is measured using spirometry. This involves the participants being instructed to blow through a mouth piece as hard as possible (quiet breathing followed by one deep inspiration and one deep expiration).

Intervention Type
Other

Primary outcome(s)
Postural stability is assessed using a force platform and motion capture taken by an optoelectronic VICON system at the study visit

Key secondary outcome(s))

1. Angulations in posture is measured using the EOS® system at the study visit
2. Gait velocity is measured using the stand up and go test at the study visit
3. Lung volume is measured using spirometry at the study visit

Completion date
30/10/2019

Eligibility

Key inclusion criteria
1. Healthy participants
2. Aged 18 years and over
3. French nationality

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Sex
All

Key exclusion criteria
1. Pregnancy (female patients)
2. Known chronic respiratory disease such as asthma, COPD etc.
3. Known chronic postural disease such as scoliosis, etc.
5. Acute infection of respiratory tract
5. Aged under 18 years

Date of first enrolment
02/11/2016

Date of final enrolment
31/10/2018

Locations

Countries of recruitment
France

Study participating centre
Laboratoire de biomécanique humaine Georges charpak Arts et Métiers ParisTech
155 boulevard de l'hôpital
Paris
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Study participating centre
Hôpital Pitié-Salpêtrière
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Sponsor information

Organisation
National Scientific Research Centre (Centre National de la Recherche Scientifique)

ROR
https://ror.org/02feahw73

Funder(s)

Funder type
University/education

Funder Name
National School of Arts and Trades (Ecole Nationale Supérieure d'Arts et Métiers)

Results and Publications

Individual participant data (IPD) sharing plan
participant level data will be available upon request to Dr Valérie Attali (valerie.attali@aphp.fr)

IPD sharing plan summary
Available on request

Study outputs

	Date	Date	Peer	Patient-

Output type	Details	created	added	reviewed?	facing?
Results article	Results posturo-respiratory coupling in a group of OSAS patients (ISRCTN70932171) and matched controls (this study)	07/02/2020	16/05/2023	Yes	No
Results article		29/04/2019	12/02/2025	Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes