IMPAIRMENT IN MOTOR IMAGERY PROGRESSIVELY INCREASES WITH MULTIPLE SCLEROSIS DISEASE EVOLUTION

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Background

NeuroImage 14, S103–S109 (2001) doi:10.1006/nimg.2001.0832, available online at http://www.idealibrary.com on IDEAL

Neural Simulation of Action: A Unifying Mechanism for Motor Cognition

Marc Jeannerod[1]

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SIMULTION THEORY

"…covert actions are in fact actions, except for the fact that they are not executed"

Decety (1989): "…the time needed for performing a task mentally was the same as that needed for actually executing the same task"

Sirigu (1995): "Imagined and executed movement times were highly correlated in normal individuals, and Fitts' law accounted equally well for imagined and executed movements"

Introduction

Research Paper

MULTIPLE SCLEROSIS JOURNAL | MSJ

The relation between cognitive and motor dysfunction and motor imagery ability in patients with multiple sclerosis

Elke Heremans[1,3], Anne-Marie D'hooge[2], Sara De Bondt[2], Werner Helsen[3] and Peter Feys[1,3,4]

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RESEARCH ARTICLE

Imagined actions in multiple sclerosis patients: evidence of decline in motor cognitive prediction

Andrea Tacchino · Marco Bove · Ludovico Pedullà · Mario Alberto Battaglia · Charalambos Papaxanthis · Giampaolo Brichetto

To assess whether MI impairment is associated with the severity of the disease

Materials and Methods

Subjects

Patients selected among those followed as outpatients at ***Italian MS Society Rehabilitation Centre***, Genoa, Italy

Inclusion/Esclusion Criteria

- McDonald Criteria
- Stable phase of the disease (no relapsing in the last 3 months)
- Right-handed (score > 90% in Edinburgh Handedness Inventory Scale)
- RR and CIS patients
- Signed written informed consent

Three groups:

- **Relapsing-Remitting Group (RR)** (20 subjects)
- **Clinically Isolated Syndrome Group (CIS)** (17 subjects)
- **Healthy Control Group (CTRL)** (20 subjects)

Materials and Methods

We collected:

- **MFIS** for fatigue
- **SDMT** for cognitive dysfunction
- **9HPT** for upper limb motor-sensory status
- **TWT** for lower limb motor-sensory status

Moreover:

- **Kinesthetic and Visual Imagery Questionnaire** (KVIQ)

The Kinesthetic and Visual Imagery Questionnaire (KVIQ) for Assessing Motor Imagery in Persons with Physical Disabilities: A Reliability and Construct Validity Study

Francine Malouin, PT, PhD, Carol L. Richards, PT, PhD, Philip L. Jackson, PhD, Martin F. Lafleur, PhD, Anne Durand, PhD, and Julien Doyon, PhD

Materials and Methods

Contents lists available at SciVerse ScienceDirect

Neuroscience Research

journal homepage: www.elsevier.com/locate/neures

Brain activity during motor imagery of an action with an object: A functional magnetic resonance imaging study

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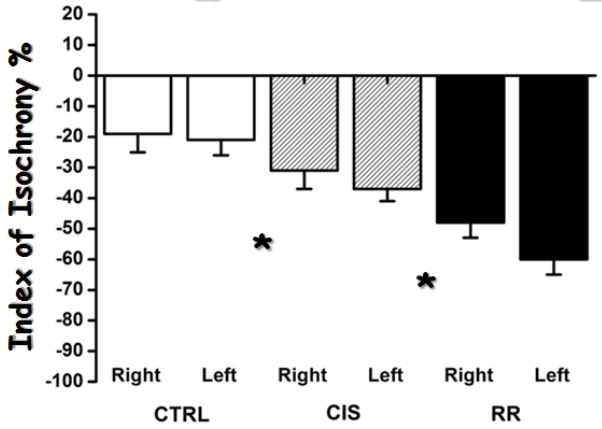
Actual Execution: with subjects squeezing a ball with dominant/non-dominant hand

Motor Imagery: with subjects imagining to squeeze a ball with dominant/non-dominant hand

Results

$$\text{Index of Isochrony} = \left[\frac{\text{N° imagined squeezes}}{\text{N° actual squeezes}} \times 100 \right] - 100$$



Conclusions

Disease evolution seems at the origin of a progressive temporal dissociation between actual and imagined movements, more relevant for the non-dominant vs. dominant hand.

This study tend to better clarify imagined actions in PwMS in order to possibly identify new rehabilitation strategies towards a better quality of life.

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Thanks!!!