Association Between Motor Symptoms and Brain Metabolism in Early Huntington Disease

Titre	Association Between Motor Symptoms and Brain Metabolism in Early Huntington Disease
Type de publication	Article de revue
Auteur	Gaura, Véronique [1], Lavisse, Sonia [2], Payoux, Pierre [3], Goldman, Serge [4], Verny, Christophe [5], Krystkowiak, Pierre [6], Damier, Philippe [7], Supiot, Frédéric [8], Bachoud-Levi, Anne-Catherine [9], Rémy, Philippe [10]
Editeur	American Medical Association
Type	Article scientifique dans une revue à comité de lecture
Année	2017
Langue	Anglais
Date	Septembre 2017
Numéro	9
Pagination	1088-1096
Volume	74
Titre de la revue	JAMA Neurology
ISSN	2168-6157
Mots-clés	Adult [11], Cerebellar Nuclei [12], Cerebellum [13], Cerebral Cortex [14], Cross-Sectional Studies [15], Female [16], Humans [17], Huntington disease [18], Hyperkinesis [19], Hypokinesia [20], Male [21], Middle Aged [22]

Résumé en anglais	Importance: Brain hypometabolism is associated with the clinical consequences of the degenerative process, but little is known about regional hypermetabolism, sometimes observed in the brain of patients with clinically manifest Huntington disease (HD). Studying the role of regional hypermetabolism is needed to better understand its interaction with the motor symptoms of the disease. Objective: To investigate the association between brain hypometabolism and hypermetabolism with motor scores of patients with early HD. Design, Setting, and Participants: This study started in 2001, and analysis was completed in 2016. Sixty symptomatic patients with HD and 15 healthy age-matched control individuals underwent positron emission tomography to measure cerebral metabolism in this cross-sectional study. They also underwent the Unified Huntington's Disease Rating Scale motor test, and 2 subscores were extracted: (1) a hyperkinetic score, combining dystonia and chorea, and (2) a hypokinetic score, combining bradykinesia and rigidity. Main Outcomes and Measures: Statistical parametric mapping software (SPM5) was used to identify all hypo- and hypermetabolic regions in patients with HD relative to control individuals. Correlation analyses ($P < .001$, uncorrected) between motor subscores and brain metabolic values were performed for regions with significant hypometabolism and hypermetabolism. Results: Among 60 patients with HD, 22 were women (36.7%), and the mean (SD) age was 44.6 (7.6) years. Of the 15 control individuals, 7 were women (46.7%), and the mean (SD) age was 42.2 (7.3) years. In statistical parametric mapping, striatal hypometabolism was significantly correlated with the severity of all motor scores. Hypermetabolism was negatively correlated only with hypokinetic scores in the cuneus (z score = 3.95, $P < .001$), the lingual gyrus (z score = 4.31, $P < .001$), and the crus I/II of the cerebellum (z score = 3.77, $P < .001$), a region connected to associative cortical areas. More severe motor scores were associated with higher metabolic values in the inferior parietal lobule, anterior cingulate, inferior temporal lobule, the dentate nucleus, and the cerebellar lobules IV/V, VI, and VIII bilaterally corresponding to the motor regions of the cerebellum (z score = 3.96 and 3.42 in right and left sides, respectively; $P < .001$). Conclusions and Relevance: Striatal hypometabolism is associated with clinical disease severity. Conversely, hypermetabolism is likely compensatory in regions where it is associated with decreasing motor scores. Hypermetabolism might be detrimental in other structures in which it is associated with more severe motor symptoms. In the cerebellum, both compensatory and detrimental contributions seem to occur. This study helps to better understand the motor clinical relevance of hypermetabolic brain regions in HD.
URL de la notice	http://okina.univ-angers.fr/publications/ua18985 [23]
DOI	10.1001/jamaneurol.2017.1200 [24]
Lien vers le document	https://jamanetwork.com/journals/jamaneurology/fullarticle/2635829 [25]
Titre abrégé	JAMA Neurol
Identifiant (ID) PubMed	28672395 [26]

Liens

[1] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=34723
[2] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=34724
[3] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=34725
[4] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=34726
[5] http://okina.univ-angers.fr/ch.verny/publications

[6] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=34727
[7] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=34728
[8] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=34729
[9] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=34730
[10] http://okina.univ-angers.fr/publications?f%5Bauthor%5D=30956
[11] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=1002
[12] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=27462
[13] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=27020
[14] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=7986
[15] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=6089
[16] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=1075
[17] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=991
[18] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=25649
[19] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=27463
[20] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=27464
[21] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=968
[22] http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=5941
[23] http://okina.univ-angers.fr/publications/ua18985
[24] http://dx.doi.org/10.1001/jamaneurol.2017.1200
[25] https://jamanetwork.com/journals/jamaneurology/fullarticle/2635829
[26] http://www.ncbi.nlm.nih.gov/pubmed/28672395?dopt=Abstract