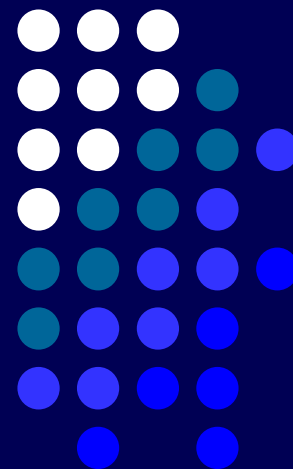
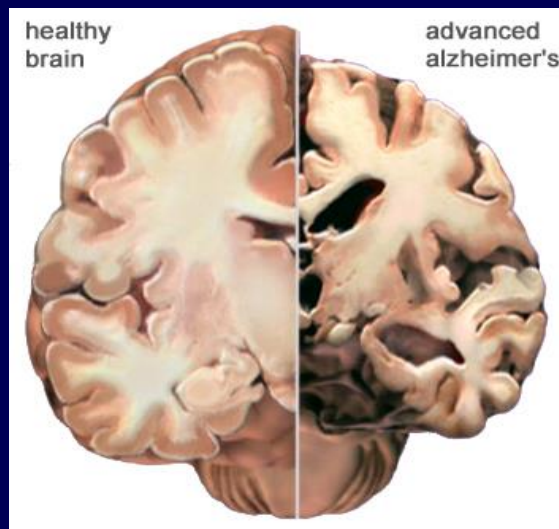
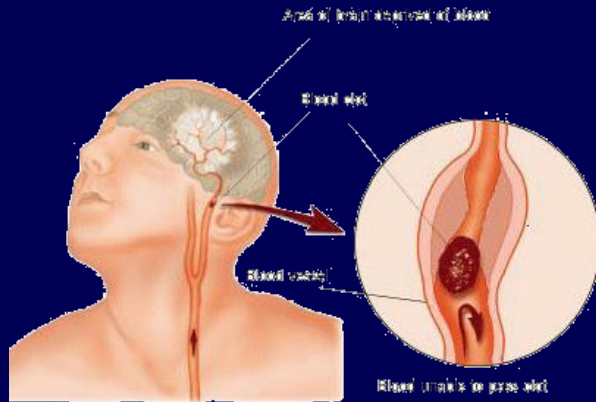


Jazykové deficity u pacientov s Parkinsonovou chorobou

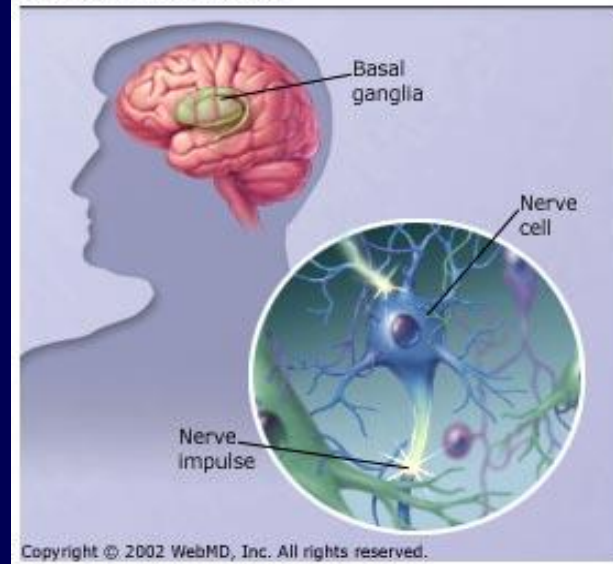


Zsolt Cséfalvay Katedra logopédie,
Ústav psychologických a logopedických štúdií PdF UK v Bratislave, 2017

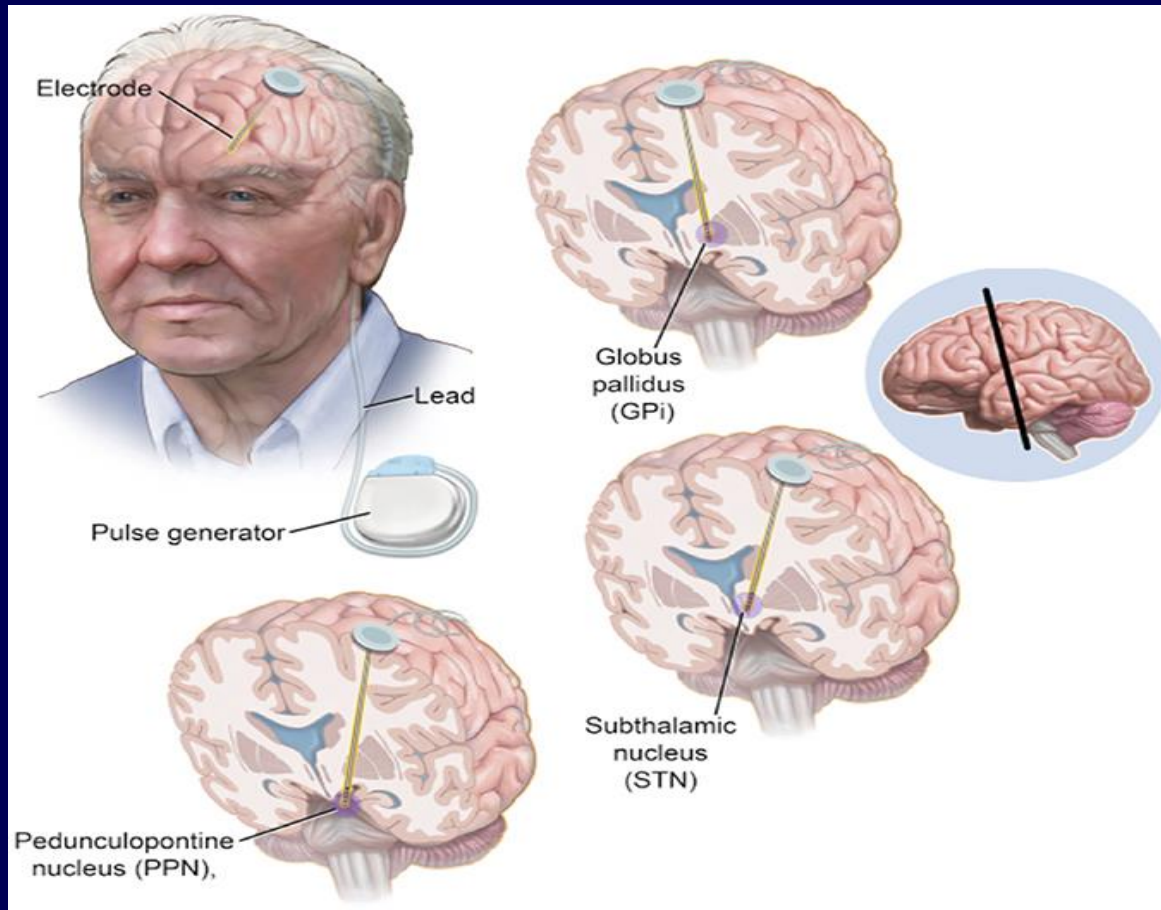
Neurogénne poruchy komunikácie (poruchy reči pri ochoreniach mozgu)



Parkinson's Disease



DBS kognícia a reči pred a po implantácii (APVV 2016-2019)



DBS kognícia a reči pred a po implantácii (APVV 2016-2019)



Deep brain stimulation and cognitive decline in Parkinson's disease: a clinical review

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Parkinson's disease is a common and often debilitating disorder, with a growing prevalence accompanying global population aging. Current drug therapy is not satisfactory enough for many patients, especially after a few years of symptom progression. This is mainly due to the motor complications that frequently emerge as disease progresses. Deep brain stimulation (DBS) is a useful therapeutic option in carefully selected patients that significantly improves motor symptoms, functional status, and quality of life. However, cognitive impairment may limit patient selection for DBS, as patients need to have sufficient mental capabilities in order to understand the procedure, as well as its benefits and limitations, and cooperate with the medical team throughout the process of selection, surgery, and postsurgical follow-up. On the other hand it has been observed that certain aspects of cognitive performance may decline after DBS, namely when the therapeutic target is the widely used subthalamic nucleus. These are important pieces of information for patients, their families, and health care professionals. This manuscript reviews these aspects and their clinical implications.

Keywords: Parkinson's disease, cognitive impairment, deep brain stimulation, dementia, functional impairment, globus pallidus interna, quality of life, subthalamic nucleus

DBS kognícia a reči pred a po implantácii (APVV 2016-2019)

OPEN ACCESS Freely available online



Subthalamic Nucleus Deep Brain Stimulation Impacts Language in Early Parkinson's Disease

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1 Department of Neurology, Vanderbilt University, Nashville, Tennessee, United States of America, **2** Brain and Language Lab, Department of Neuroscience, Georgetown University, Washington, District of Columbia, United States of America, **3** Department of Psychology, Center for Language Science, Pennsylvania State University, University Park, Pennsylvania, United States of America

Abstract

Although deep brain stimulation (DBS) of the basal ganglia improves motor outcomes in Parkinson's disease (PD), its effects on cognition, including language, remain unclear. This study examined the impact of subthalamic nucleus (STN) DBS on two fundamental capacities of language, grammatical and lexical functions. These functions were tested with the production of regular and irregular past-tenses, which contrast aspects of grammatical (regulars) and lexical (irregulars) processing while controlling for multiple potentially confounding factors. Aspects of the motor system were tested by contrasting the naming of manipulated (motor) and non-manipulated (non-motor) objects. Performance was compared between healthy controls and early-stage PD patients treated with either DBS/medications or medications alone. Patients were assessed on and off treatment, with controls following a parallel testing schedule. STN-DBS improved naming of manipulated (motor) but not non-manipulated (non-motor) objects, as compared to both controls and patients with just medications, who did not differ from each other across assessment sessions. In contrast, STN-DBS led to worse performance at regulars (grammar) but not irregulars (lexicon), as compared to the other two subject groups, who again did not differ. The results suggest that STN-DBS negatively impacts language in early PD, but may be specific in depressing aspects of grammatical and not lexical processing. The finding that STN-DBS affects both motor and grammar (but not lexical) functions strengthens the view that both depend on basal ganglia circuitry, although the mechanisms for its differential impact on the two (improved motor, impaired grammar) remain to be elucidated.

Citation: Phillips L, Litcofsky KA, Pelster M, Gelfand M, Ullman MT, et al. (2012) Subthalamic Nucleus Deep Brain Stimulation Impacts Language in Early Parkinson's Disease. PLoS ONE 7(8): e42829. doi:10.1371/journal.pone.0042829

Editor: Veronique Sgambato-Faure, INSERM/CNRS, France

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Competing Interests: The authors have declared that no competing interests exist.

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☯ These authors contributed equally to this work.

Prvé príznaky choroby pred dg. PCH...

- diskkrétne problémy pri súvislom prejave
- ťažkosti pri formulovaní myšlienok
- zjednodušená syntax
- „hľadanie slov“
- vyhýbanie sa verejným prejavom
- žiadne iné subj. ťažkosti

asi tri roky pred potvrdením
diagnózy PCH



Speech and language disorders in PD

Motor speech disorders
(motorické poruchy řeči)

hypokinetická dysarthria

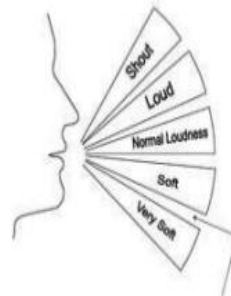
Language disorders
(jazykové deficity)

PD Hypokinetic Dysarthria & Perceptual Speech Characteristics:

1. Reduced loudness/vocal intensity
2. Hoarse vocal quality
3. Monotone
4. Imprecise articulation
5. Vocal tremor

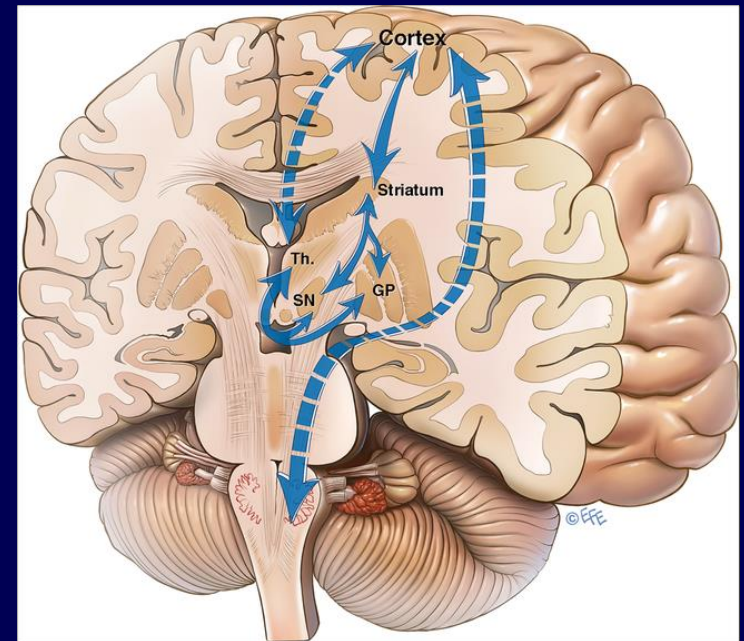
IMPORTANT Those with PD have a incorrect self-perception of LOUDNESS. Sensory Perception of their own loudness is that it is adequate (Ho et al., 1999) even though they are 24 dB below the average speaker (Fox & Ramig, 2006).

RELATIVE VOCAL LOUDNESS LEVEL OF AN INDIVIDUAL WITH PARKINSON DISEASE



(Adapted from Carolyn Adair-Bennett, 1991)

Vocal loudness level of an individual with Parkinson's disease



Jazykové deficity pri PCH (Cortex, 2009)

CORTEX 45 (2009) 912–914



available at www.sciencedirect.com



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



Special issue: Editorial

Language and Parkinson's Disease

Roelien Bastiaanse^{a,b,*} and Klaus L. Leenders^{b,c}

^aCenter for Language and Cognition Groningen (CLCG), University of Groningen, The Netherlands

^bSchool for Behavioral and Cognitive Neuroscience (BCN), University of Groningen, The Netherlands

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Jazykové deficity na úrovni:

- slov (lexikálno-sémantická rovina)
- viet : produkcia aj porozumenie (morfosyntax)
- súvislej spontánnej reči, diskurzu

Jazykové deficity na úrovni:

- slo

- vie

- sú

**Jazykové deficity prítomné
aj u pacientov s PCH
bez demencie!**

(tax)

Jazykové deficity na úrovni:

- slo

- vie

- sú

**Jazykové deficity ako samostatné
narušenie (afázia?),
alebo dôsledok porúch EF?**

(tax)

Jazykové deficity na úrovni:

Význam výskumu:

- slo

- 1) teoretický:

účasť BG v jazykových procesoch

- vie

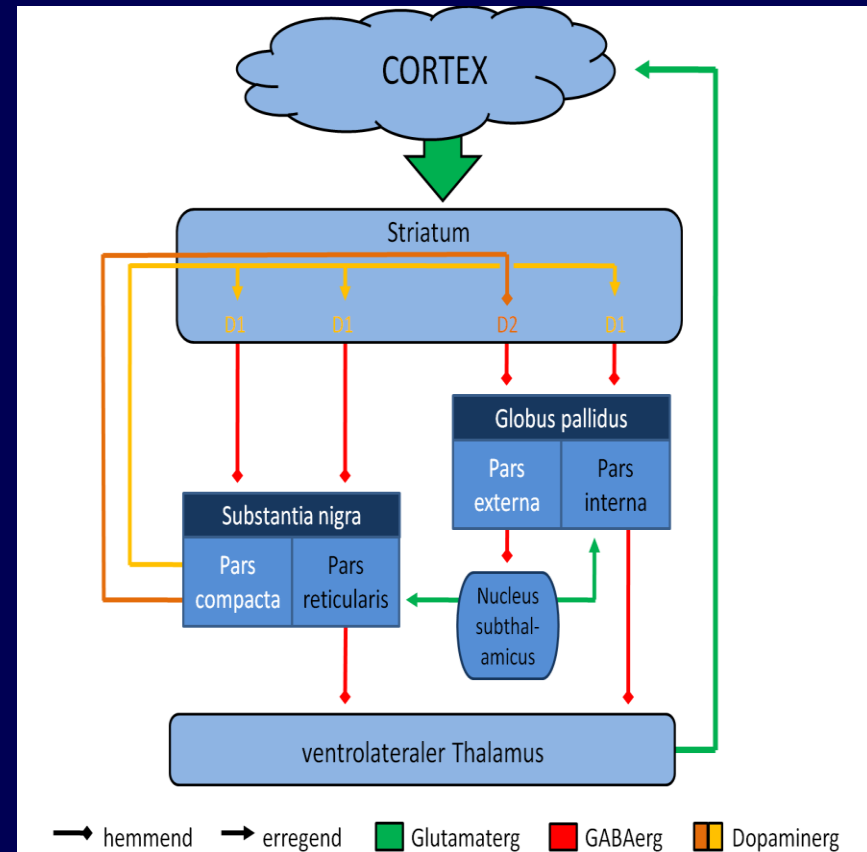
(tax)

- 2) Jazykové deficity ako včasný
marker PCH ???

- sú

Jazykové deficity na úrovni: **slov (lexikálno-sémantická rovina):**

- horšie pomenovanie alebo produkcia činnostných slovies (**action verbs**)
Bertella et al.2002, Cotelli et al. 2007, Crescentini, 2008, Peran, 2003
- deficity ako dôsledok narušenia **fronto-striatálnych** okruhov



Jazykové deficity na úrovni: slov (lexikálno-sémantická rovina):

Brain Cogn. 2002 Mar-Apr;48(2-3):277-80.

Noun verb dissociation in Parkinson's disease.

Bertella L¹, Albani G, Greco E, Priano L, Mauro A, Marchi S, Bulla D, Semenza C.

Pravouhlý výstrižok

⊕ Author information

Abstract

A noun/verb dissociation with a relative verb deficit was found in patients affected by Parkinson's disease, even in relatively early stages, when mental deterioration is not severe. This finding is compatible with earlier observations, according to which verbs are dealt with in more anterior regions with respect to nouns. It also supports the speculation that the co-ordination and the manipulation of information associated with a verb world rely on the frontostriatal system.

- 102 obrázkov (52 predmetov, 50 činností)
- early stage PCH (N=22), ZK (N=20)
- PCH (MMSE a RPM v norme)
- PCH signif. horšie ako norma
- PCH: činnosti horšie ako objekty (kým u ZK nebol rozdiel)

Jazykové deficity na úrovni: slov (lexikálno-sémantická rovina):

Mov Disord. 2003 Feb;18(2):150-6.

Deficit of verb generation in nondemented patients with Parkinson's disease.

Péran P¹, Rascol O, Démonet JF, Celsis P, Nespoulous JL, Dubois B, Cardebat D.

⊕ Author information

Abstract

Clinical and neuroimaging studies have shown that verb processing suggests a preferential participation of a prefrontal network, which is dysfunctional in Parkinson's disease (PD). To assess a verb processing deficit in PD, we compared noun- and verb-generation tasks for 34 nondemented PD patients (according to the Dementia Rating Scale) with 34 matched normal subjects, using two intracategory tasks (noun/noun and verb/verb generation) and two intercategory tasks (noun/verb and verb/noun generation). PD patients were significantly impaired in the two tasks involving verb production, i.e., verb/verb and noun/verb generation, whereas their performance was similar to those of controls in the two tasks requiring noun production. For the two impaired tasks, we assessed 1) the influence of lexical competition that corresponds to the presence of several candidate words for a given stimulus; 2) the influence of slight cognitive dysfunction; and 3) the influence of motor deficit. Significant correlations were found between DRS scores and performance on the noun/verb task, and no significant correlations were found between lexical competition or motor deficit and performance. The specific deficit for verb production in PD patients is discussed in relation to deficits affecting either action or grammatical representations.

- 80 počutých stimulov (40 PM, 40 činnostných S)
- úloha: slovná asociácia k počutému slovu
- subkategórie: S/S, PM/PM, S/PM, PM/S
- 34 PCH, 34 ZK
- PCH (MMSE, DRS, UPDRS III)
- PCH signif. horšie pri oboch úlohách asociácie S, nie pri PM

Jazykové deficity na úrovni: slov (lexikálno-sémantická rovina):

European Journal of Neurology 2007, **14**: 632–637

doi:10.1111/j.1468-1331.2007.01797.x

Action and object naming in Parkinson's disease without dementia

M. Cotelli^a, B. Borroni^b, R. Manenti^c, M. Zanetti^b, A. Arévalo^{c,d}, S. F. Cappa^c and A. Padovani^b

^a*IRCCS S. Giovanni di Dio – Fatebenefratelli, Brescia, Italy;* ^b*Department of Neurology, University of Brescia, Brescia, Italy;* ^c*Vita Salute University and San Raffaele Scientific Institute, Milan, Italy;* and ^d*Center for Research in Language, University of California at San Diego, San Diego, CA, USA*

Keywords:

language, naming,

Parkinson's disease

The present study aimed to assess the ability in objects and actions naming in Parkinson's disease (PD) patients. Further, we wished to assess the effect of a particular conceptual dimension, i.e. manipulability, on the naming of objects and actions.

- 32 „early“ PCH, 15 ZK
- činností / objekty (manipulovateľné /nemanipulovateľné)
- PCH horšie ako ZK (obe kategórie)
- PCH: horšie činnosti ako objekty

ed in patients with PD, possibly reflecting the presence of prefrontal dysfunction.

Jazykové deficity na úrovni: slov (lexikálno-sémantická rovina):

[Cortex](#), 2012 Jul;48(7):900-4. doi: 10.1016/j.cortex.2010.12.007. Epub 2010 Dec 23.

The effect of motion content in action naming by Parkinson's disease patients.

Herrera E¹, Rodríguez-Ferreiro J, Cuetos F.

⊕ Author information

Abstract

INTRODUCTION: The verb-specific impairment present in patients with motion-related neurological diseases has been argued to support the hypothesis that the processing of words referring to motion depends on neural activity in regions involved in motor planning and execution. We presented a group of Parkinson's disease (PD) patients with an action-naming task in order to test whether the prevalence of motion-related semantic content in different verbs influences their accuracy.

METHOD

neuropsy

14 young

were sele

RESULTS

motor co

general l

each ver

of motion

CONCLU

movements in the retrieval of motion-related semantic content.

- obr. činností (high / low motion content)
- PCH: horšie s vysokým ako nízkym obsahom pohybu
- ZK: bez rozdielov

ent a neurological and
were obtained from
s of motor component
racteristics.

o pictures with high
trol group. The
d semantic content of
affected by the level

execution of

Prečo existuje táto disociácia?

- (1) Frontálne oblasti a BG hrajú významnú úlohu pri sémantickej reprezentácii slovies (teória „**embodied cognition**“ senzo-motorický systém prispieva k vytváraniu konceptuálnych vedomostí)
- (2) F oblasti a BG hrajú významnú úlohu pri gramatickom spracovaní slovies (PM - argumenty vety, slovesá organizujúce argumenty)
- (3) Významnejšia úloha EF pri spracovaní slovies ako PM (teda deficity „slovies“ sú dané narušením EF)

Význam testovania S/PM?

(Cardona et al, 2013)

1) Špecifický marker PCH?

ale táto disociácia S/PM je prítomná aj pri

PSP (Bak et al. 2001, Bak, 2006),

FTDL (d'Honincthum, Pillon, 2008)

ALS (Bak Hodges, 2004, Neary et al. 2000)

2) Deficit prítomný aj v subklinickom štádiu? Aj bez prítomných deficitov EF (jadrový deficit pri PCH)?

Výskum APVV (1)

- Porovnanie pomenovanie objektov a činností u pacientov s PCH bez demencie

Metodika

- Test pomenovania obrázkov
- Batéria testov EF:
 - TMT
 - Stroopov test
 - Verbálna fluencia
 - Opakovanie písmen a čísiel

Diagnostické metódy na úrovni slova

Test pomenovania obrázkov
(Šteňová, Cséfalvay, 2011)

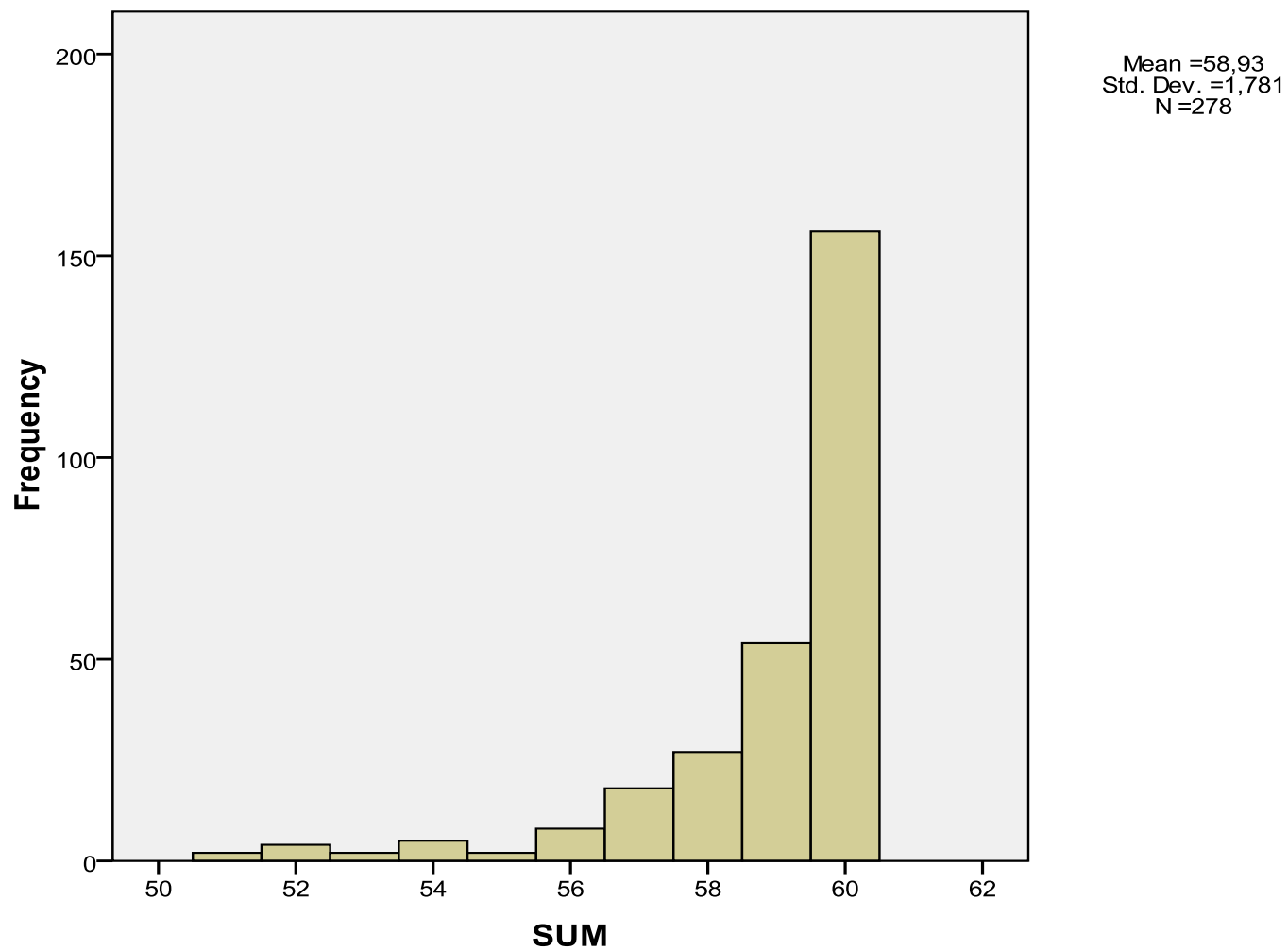
Object and action naming



- 30 PM
- 30 S
- frekvencia slova
- vek osvojenia si slov



TPO výkony normy N= 278 58,93 (SD=1,78)



Charakteristika vzorky

- 37 PCH bez demencie
- Vek = 63.03, SD=9,
Trvanie ochorenie = 7.87, SD=4.85,
H&Y=2-3, Mean UPDRS III-ON=32.21, SD=9.40,
MoCA=26,24, SD=2,1
- 37 ZK (vek, vzdelanie a pohlavie)

Porovnanie PCH a ZK (29-29)

	w	p	Cohen's d
Celkové skóre	570.5	0.211	0.602
PM (objekty)	406.0	0.765	-0.105
S (činnosti)	471.5	0.281	0.431
Oneskorené PM	505.5	0.086	0.598
Oneskorené S	534.5	0.027	0.674
Mann-Whitney U Test			

Batéria testov na EF

	Spearman's rho		
	Celkové skóre	PM	S
Fonemic fluency	-,001	-,091	,081
Semantic fluency	,264	,059	,452*
Letter - Number Sequencing - verbal working memory	,527**	,416*	,389*
Stroop - Words - Processing speed	,411*	,257	,418*
Stroop - Colors - Processing speed	,215	,021	,373*
Stoop - Color/Words - Sensitivity to interference	,363	,166	,297
TMT-A - Processing speed	-,296	-,105	-,335
TMT-B - Cognitive flexibility	-,275	-,048	-,430*
Executive functions - Composite Score	,471*	,311	,402*
*p<,05; **p<,01			

Sumár

- V teste TPO sme nezistili signif. rozdiel medzi PCH a ZK
- Pomenovanie činností (sloveso) až po 10 sekundách bolo signifikantne častejšia u pacientov s PCH
- Pomenovanie činností (S) bolo viac ovplyvnené EF ako pri pomenovaní objektov (PM)

Jazykové deficity na úrovni:

- slov (lexikálno-sémantická rovina)
- **viet : produkcia aj porozumenie (morfosyntax)**
- súvislej spontánnej reči, diskurzu

Produkcia viet pri PCH

Brain Lang. 1988 Jan;37(1):146-60.

Language production in Parkinson's disease: acoustic and linguistic considerations.

Illes J¹, Metter EJ, Hanson WR, Iritani S.

⊕ Author information

Abstract

The hypokinetic dysarthria of Parkinson's disease (PD) has been described extensively. In contrast, patterns of hesitation and the language structure in spontaneous speech of the PD patient have not been investigated, although several studies have shown language-related abnormalities in word naming, word generation, and verbal recall. In the present study, 10 male Parkinson's patients and 10 normal male speakers were compared in a reading and spontaneous speaking paradigm for acoustic and linguistic features. Among acoustic measures, fundamental frequency and relative intensity differentiated PD from control subjects, consistent with reported features of hypokinetic dysarthria. The striking observations among linguistic measures differentiating PD from control subjects were an increase in the number of (a) silent hesitations per minute, (b) abnormally long silent hesitations, (c) words per silent hesitation, (d) open class phrases, and (e) optional open phrases per speech sample, and a decrease in the number of modalizations and interjections. An increase in the number of filled hesitations occurring per minute, as well as a decrease in syntactic complexity separated moderate from mild Parkinson's patients. Our interpretation of the data favors the hypothesis that changes in the structure of spontaneous language production with increasing severity of dysarthria reflect PD patients' adaptation to their disease.

- PCH 10, ZK 10 (čítanie, spotánná rečová produkcia)
- zjednodušená syntax u pacientov s PCH
- ako adaptívny, kompenzačný mechanizmus pri hypokinetickej dysartrii?

Poruchy porozumenie viet pri PCH

Grossman M, Carvell S, Stern MB, Gollomp S, and Hurtig HI. Sentence comprehension in Parkinson's disease: the role of attention and memory. *Brain and Language*, 42: 347–384, 1992.

Grossman M, Cooke A, Devita C, Lee C, Alsop D, Detre J, et al. Grammatical and resource components of sentence processing in Parkinson's disease: an fMRI study. *Neurology*, 60: 775–781, 2003.

Poruchy porozumenie viet pri PCH

SAGE-Hindawi Access to Research
Parkinson's Disease
Volume 2011, Article ID 213983, 15 pages
doi:10.4061/2011/213983

Pravouhlý výstrižok

Research Article

Sentence Comprehension and Its Association with Executive Functions in Patients with Parkinson's Disease

Klaus E. Colman,¹ Janneke Koerts,² Laurie A. Stowe,¹
Klaus E. Koerts,³ and Roelien Bastiaanse¹

¹ Department of Psychology, University of Groningen, P.O. Box 716, 9700 AS Groningen, The Netherlands

² Department of Clinical Neuropsychology, University of Groningen, Grote Kruisstraat 2/1,
9712 TS Groningen,

³

28 PCH, 28 ZK
test porozumenia viet + testy EF

PCH signifikatne horšie ako KZ
„Set-switching“ a porozumenie viet – signif. korelácia

[Neuropsychologia](#), 2001;39(9):962-71.

Basal ganglia dysfunction, working memory, and sentence comprehension in patients with Parkinson's disease.

[Skeel RL](#)¹, [Crosson B](#), [Nadeau SE](#), [Alcina J](#), [Bauer RM](#), [Fennell EB](#).

⊕ Author information

Abstract

To investigate the role of basal ganglia in working memory and sentence comprehension, 14 patients with Parkinson's disease (PD) were administered measures of semantic and phonological working memory, and a measure of sentence comprehension, while receiving medication, during medication withdrawal, and after a period of withdrawal from these medications. An age- and education-matched control group was also administered the same measures. Comparison with control subjects revealed deficits in patients with PD in working memory and sentence comprehension during medication withdrawal and after a period of withdrawal from these medications. PD patients performed as well as controls on sentence comprehension during medication withdrawal and after a period of withdrawal from these medications.

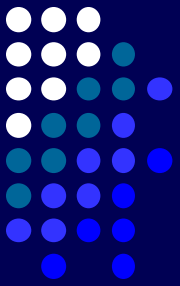
14 PCH, 14 ZK

test porozumenia viet + pracovná pamäť (sem/phonog. WM)
vyšetrenia v ON a OFF fáze

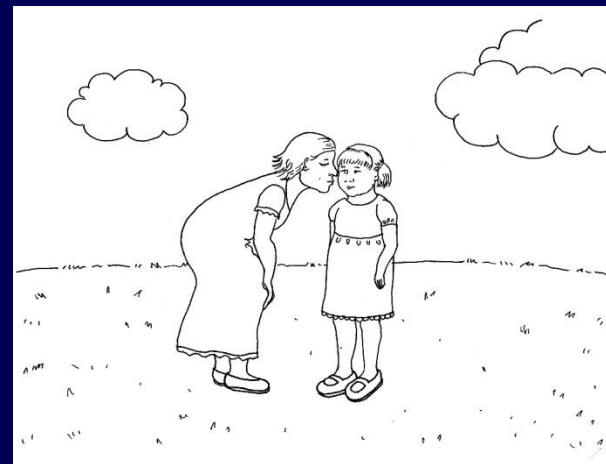
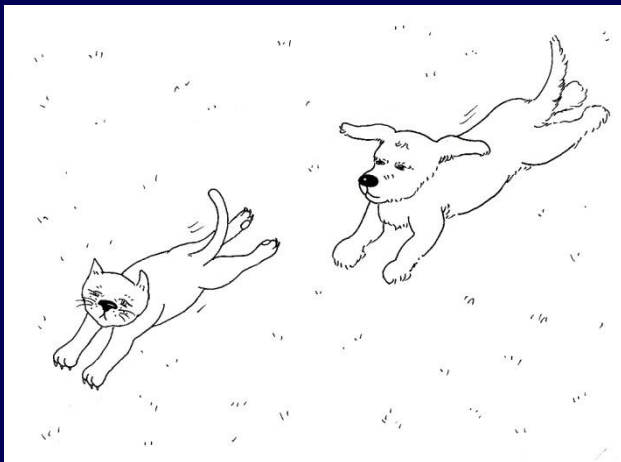
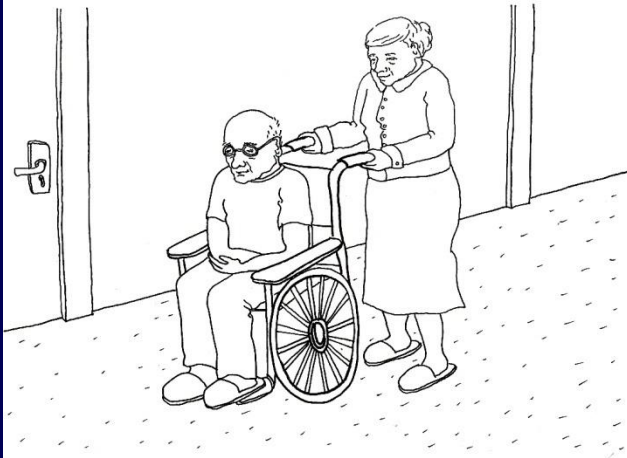
PCH signifikatne horšie „vety“ ako KZ (On aj OFF)

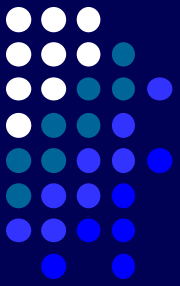
PCH rovnako ako ZK v úlohách pracovnej pamäti

Pri PCH zlé porozumene viet nielen pre dysfunkciu BG



Test porozumenia viet

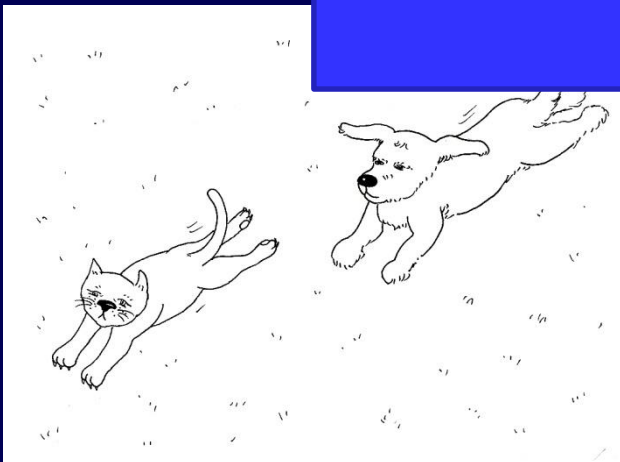




Test porozumenia viet



Reverzibilné vety:
kanonické/nekanonické
poradie slov



Typ vety	Kontrolná skupina			PCH			Mann-Whitney	
	M	SD	Md	M	SD	Md	U-test	p
ovs	15,2	1,5	16,0	14,7	1,9	16,0	611,5	0,36
pas	15,6	0,9	16,0	15,4	1,3	16,0	675,5	0,892
ES	15,2	1,5	16,0	15,0	1,8	16,0	643	0,566
EO	14,7	1,6	15,0	13,0	3,0	14,0	469,5	0,016*
RO	15,2	1,3	16,0	14,9	1,9	16,0	631,5	0,503
RS	15,3	1,0	16,0	14,6	2,1	16,0	607,5	0,343

Porozumenie viet pri PCH - sumár

Pacienti s PCH dosahujú **signifikantne horšie výsledky** v porovnaní so zdravými subjektmi v porozumení syntakticky zložitejších viet.

(napr. EO vety, ktoré obsahujú včlenenú vzťahnú vetu a v ktorých je **poradie sémantických rolí nekanonické** (najprv patiens, potom agens)).

Jazykové deficity na úrovni:

- slov (lexikálno-sémantická rovina)
- viet : produkcia aj porozumenie (morfosyntax)
- **súvislej spontánnej reči, diskurzu**

Jazykové deficity na úrovni súvislej spontánnej reči, diskurzu

McNamara, P., & Durso, R. (2003). Pragmatic communication skills in patients with Parkinson's disease. *Brain and Language*, 84, 414–423.

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Narrative Discourse Cohesion in Early Stage Parkinson's Disease.

Ellis C¹, Crosson B^{2,3}, Gonzalez Rothi LJ^{4,5}, Okun MS^{4,6}, Rosenbek JC^{5,7,8}.

Prevedený výstrižok

⊕ Author information

Abstract

BACKGROUND: Models of basal ganglia (BG) function suggest that expressive language deficits will likely and consistently present in BG disease. Disparities currently exist between the predictions of models of BG function in expressive language and data from studies of BG disease. Traditional expressive language assessment methodologies that emphasize measures of language form (word and sentence productivity) while not carefully considering how language is used, may only partially account for these disparities.

OBJECTIVE: To use measures of cohesion to examine the use of cohesive markers in narrative discourse.

METHODS: Twelve individuals with idiopathic Parkinson's disease (PD) were compared to 12 matched neurologically intact controls on measures of discourse performance. Three discourse samples (typical day, memorable vacation and family) were analyzed for measures of narrative productivity, number of cohesive ties and cohesive adequacy. Mixed model analyses were completed for group comparisons.

RESULTS: Group differences were not observed on measures of language form as measured by narrative productivity, communication units, and number of cohesive ties produced. In contrast, group differences were observed in cohesive adequacy as individuals with PD produced a higher percentage of incomplete and erroneous cohesive ties relative the control subjects across narratives.

CONCLUSIONS: These results support the conclusion that the BG in PD may have an executive role in expressive language use that can be disrupted without impacting language form.

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zníženie informatívnosti a stručnosti rečového prejavu (hovoria rovnako veľa ako zdraví jedinci, ale ich prejav je menej informatívny = produktivita /kvantita/ rovnaká, ale efektivita nižšia),

- narušená pragmatická komunikačná kompetencia (pričom oni sami nepociťujú, že ich pragmatické komunikačné schopnosti sú oslabené, t. j. preceňujú svoju pragmatickú komunikačnú kompetenciu),

- využívanie kratších, syntakticky jednoduchších viet a produkcia väčšieho množstva gramaticky nesprávnych alebo neúplných viet v porovnaní s ich náprotivkami z kontrolnej skupiny,

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Jazykové deficity na úrovni súvislej spontánnej reči, diskurzu

- ťažkosti so zaznamenávaním vlastných chýb a s ich opravovaním,
- opakovanie slabík a slov,
- nadbytok irelevantných informácií,
- zvýšená miera využívania podradovacích spojok a vedľajších viet,
- chybné využívanie jazykových konektorov, t. j. jazykových prostriedkov prepájajúcich navzájom jednotlivé textové jednotky v rečovom prejave.

Význam pre prax...?

[J Int Neuropsychol Soc. 2017 Feb;23\(2\):150-158. doi: 10.1017/S1355617716000710.](#)

Language Deficits as a **Preclinical Window** into Parkinson's Disease: Evidence from Asymptomatic Parkin and Dardarin Mutation Carriers.

[García AM¹](#), [Sedeño L¹](#), [Trujillo N²](#), [Bocanegra Y³](#), [Gomez D²](#), [Pineda D³](#), [Villegas A⁴](#), [Muñoz E⁵](#), [Arias W⁶](#), [Ibáñez A¹](#).

⊕ Author information

Abstract

OBJECTIVES: The worldwide spread of Parkinson's disease (PD) calls for sensitive and specific measures enabling its early (or, ideally, preclinical) detection. Here, we use language measures revealing deficits in PD to explore whether similar disturbances are present in asymptomatic individuals at risk for the disease.

METHODS: We administered executive, semantic, verb-production, and syntactic tasks to sporadic PD patients, genetic PD patients with PARK2 (parkin) or LRRK2 (dardarin) mutation, asymptomatic first-degree relatives of the latter with similar mutations, and socio-demographically matched controls. Moreover, to detect sui generis language disturbances, we ran analysis of covariance tests using executive functions as covariate.

RESULTS: The two clinical groups showed impairments in all measures, most of which survived covariation with executive functions. However, the key finding concerned asymptomatic mutation carriers. While these subjects showed intact executive, semantic, and action-verb production skills, they evinced deficits in a syntactic test with minimal working memory load.

CONCLUSIONS: We propose that this sui generis disturbance may constitute a prodromal sign anticipating eventual development of PD. Moreover, our results suggest that mutations on specific genes (PARK2 and LRRK2) compromising basal ganglia functioning may be subtly related to language-processing mechanisms. (JINS, 2017, 23, 150-158).

Význam pre prax...?

- Diagnostika v časnom štádiu PCH?
- Zmapovanie jazykových deficitov a dynamiku zmien?
- **Voľba komunikačných stratégií!**

Ďakujem za pozornosť!

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