NEUROPHYSIOLOGICAL EVALUATION OF PAIN PROCESSING IN PROGRESSIVE SUPRANUCLEAR PALSY

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INTRODUCTION

Pain is a common non-motor symptom in Progressive Supranuclear Palsy (PSP), indeed it is reported in 35-67% of PSP patients. Pain has received very little attention in terms of clinical characterization and nature and the data, nowadays, are not derived from controlled trials but were obtained from questionnaires on quality of life.

METHODS

In this study we investigated central nociceptive processing in a group of 12 PSP patients by means of the neurophysiological evaluation of the threshold of the nociceptive flexion reflex (TR-NWR) and the temporal summation threshold (TST-NWR). The investigation was conducted comparatively in a group of 15 patients with Multiple System Atrophy (MSA), in 15 patients with Parkinson's disease (PD) and in 24 healthy controls (HC). All patients were evaluated during "on" and "off" treatment with L-dopa.

	PSP	MSA	PD	HC	p value
N° Subjects	12	15	15	24	> 0,005
Age	63,2± 7,1	65,3 ± 7,0	63,0 ± 9,1	62,1 ±11,1	> 0,005
Sex	9/3	6/8	11/4	13/11	> 0,005

RESULTS

The data obtained show a significant reduction in the TR-NWR and in the TST-NWR in all the 3 groups of patients (PSP, MSA and PD) when compared with HC, without any statistical differences among the 3 patients' groups.

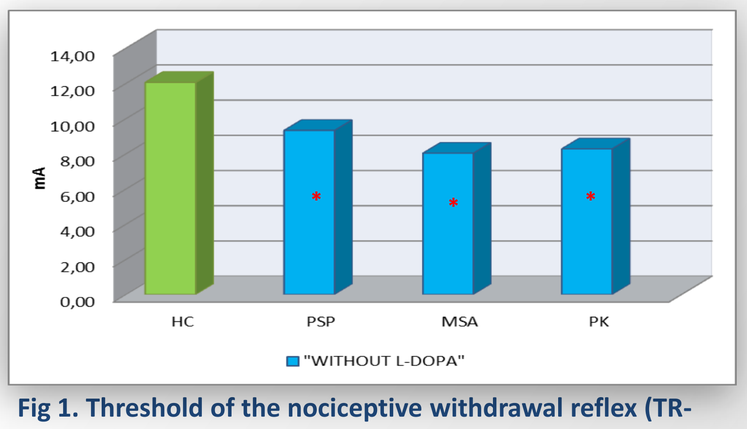

Fig 1. Threshold of the nociceptive withdrawal reflex (TR-NWR): * = p <0.005 vs. HC.

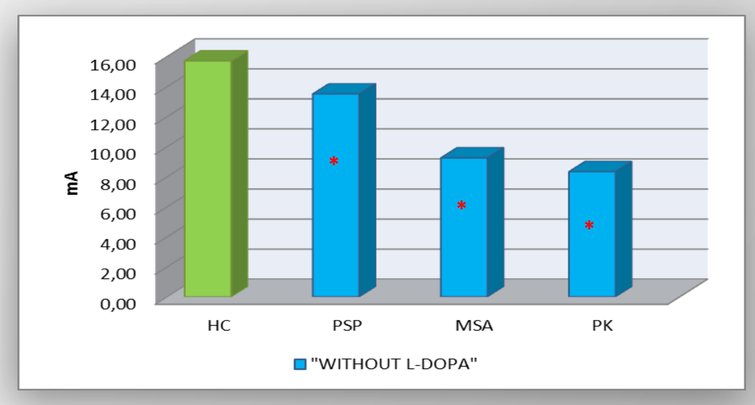

Fig 2. Temporal summation threshold (TST-NWR):
* = p <0.005 vs. HC.

The administration of L-dopa induced an increase in TR-NWR and TST-NWR in all the 3 group of patients. This L-dopa-induced increase in TR-NWR and TST-NWR reached a statistically significant level only in the PSP group.

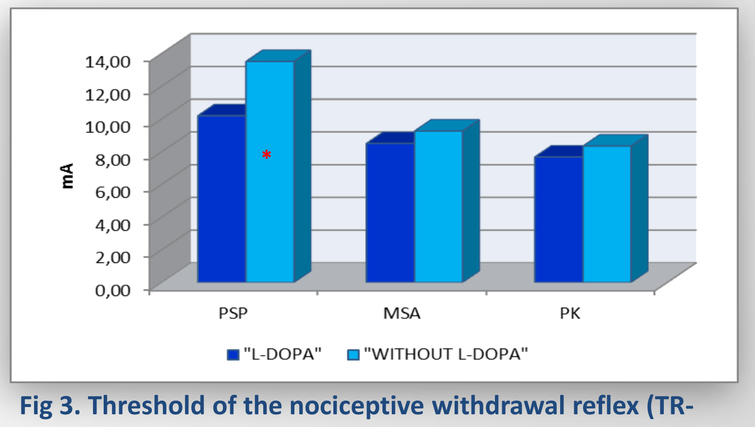

Fig 3. Threshold of the nociceptive withdrawal reflex (TR-NWR): * = p <0.005 "L-dopa" vs. "Without L-dopa".

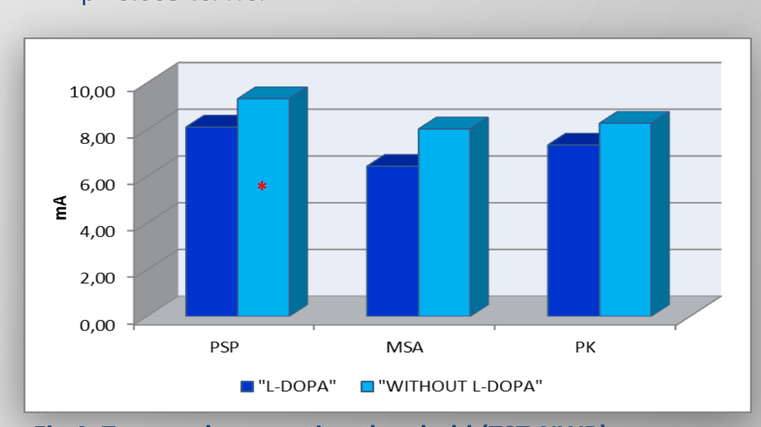

Fig 4. Temporal summation threshold (TST-NWR):
* = p <0.005 "L-dopa" vs. "Without L-dopa".

The ultimate effect of L-dopa on TR-NWR and TST-NWR in PSP was a clear tendency toward the normalization of values.

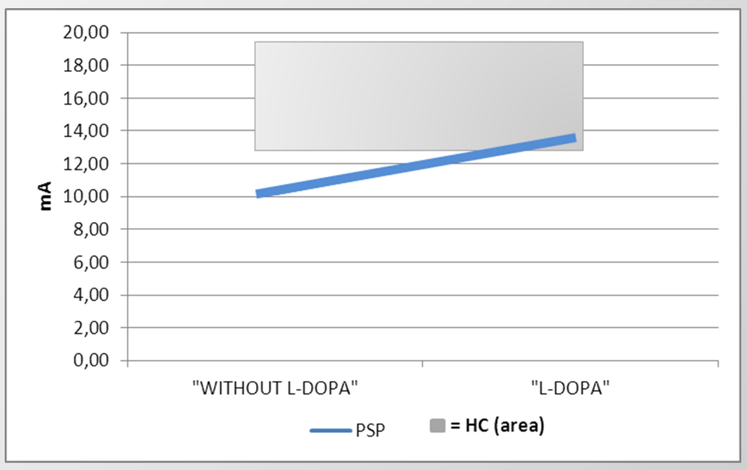

Fig *5.* Threshold of the nociceptive withdrawal reflex (TR-NWR):
PSP tendency toward normalization values (HC) after L-dopa administration.

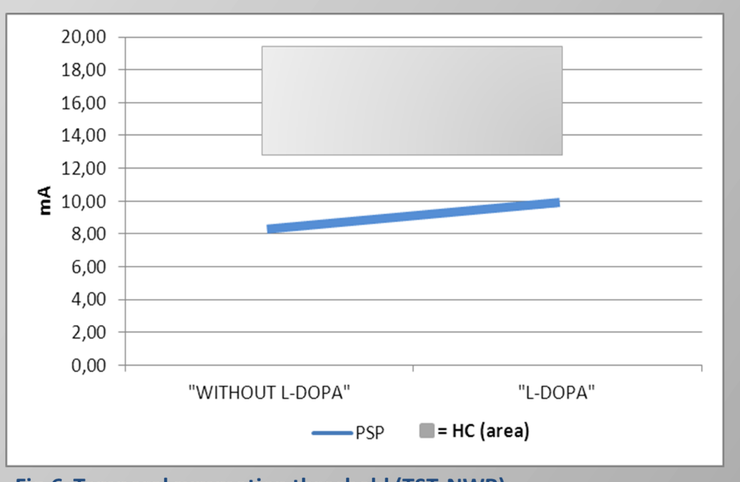

Fig *6.* Temporal summation threshold (TST-NWR):
PSP tendency toward normalization values (HC) after L-dopa administration.

CONCLUSION

Our findings suggest an increased facilitation of pain processing in PSP, MSA and PD. This is likely a consequence of the degenerative phenomena involving central projections implicated in the modulation of pain, which make patients more predisposed to develop pain condition. The modulatory effect of levodopa, on pain, observed in this study exclusively in the PSP group, seems apparently in contrast with the lower motor response to levodopa typical of PSP patients. This unexpected finding may be related to the different distribution and severity of the neurodegenerative process in PSP as compared to PD or MSA.

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