SERVIZIO SANITARIO REGIONALE
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Levodopa/carbidopa intestinal gel infusion: effects on gait and balance impairment in Idiopathic Parkinson's Disease

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Objectives: In advanced stages of idiopathic Parkinson's disease (iPD) axial symptoms, like gait and balance disorders, worsen progressively and this impact negatively on ADL, care giver burden and is a cause of increased mortality. In this stage anti-parkinsonian oral therapy shows less efficacy on these symptoms and in part this phenomenon is considered secondary to non-dopaminergic involvement. Levodopa/carbidopa intestinal gel infusion (LCIG) is a valid therapeutic option in advanced iPD and showed benefit also in long term follow up on motor and non motor symptoms. Less is known about the effect of LCIG on balance and gait in iPD patients.

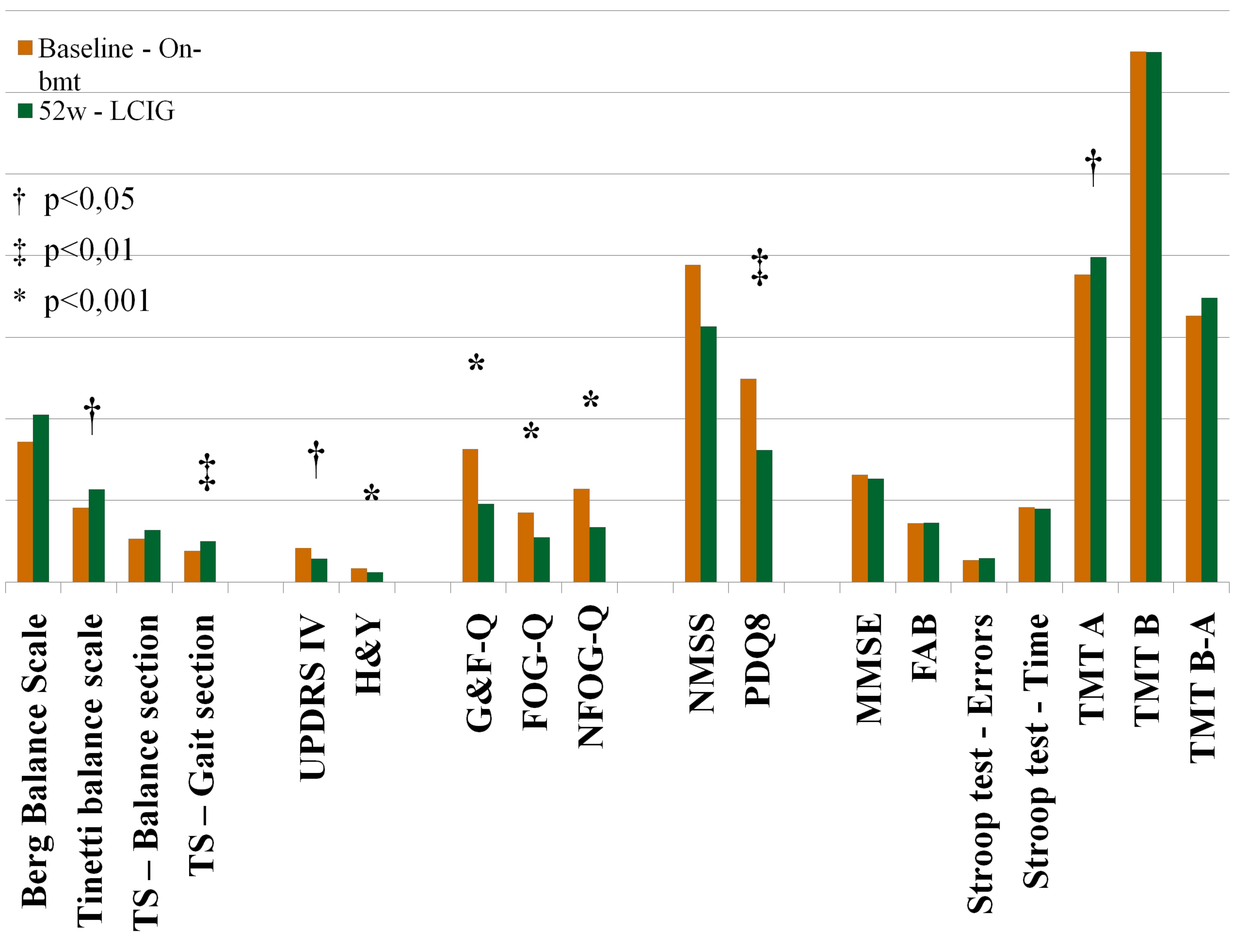

Figure 1 – Clinimetrics at baseline and at 52 weeks follow-up [mean]

Materials and Methods: 15 advanced iPD patients with balance and gait impairment have been enrolled in a prospective open-label observational study. Motor performance have been evaluated with UPDRS III and IV, H&Y, Berg Balance Scale (BBS), Tinetti mobility assessment (TS), Gait and Falls questionnaire (G&F-Q), FOG questionnaire (FOG-Q), new FOG questionnaire (NFOG-Q). All evaluations were made in off condition (after at least 12 hours wash-out), in oral anti-parkinsonian best medical treatment (On-bmt – 125% levodopa carrying to On condition) and during stable LCIG infusion at 52 weeks (52w) of follow-up. Extensive Cognitive test and quality of life assessment (PDQ8) has been performed at baseline and at 52w. Objective analysis of gait and balance have been carried out with accelerometer, along the three therapeutic conditions using two different walking path with well recognized FOG triggers.

	Mean ±SD
Sex	6 F, 9 M
PD Phenotype	8 T, 7 RA
Age (years)	68,87 ± 5,7
Age of onset (years)	49,8 ± 10,25
H&Y - stage	3,40 ± 0,51
PD duration	19,07 ± 8,02
Freezers (%)	80 %
LEDD before LCIG	1477 ± 468,82
LEDD during LCIG	1422 ± 353,25
MMSE at onset <24 (%)	13,33

Table 1 - Demographic and essential clinical characteristics
T: tremorigen phenotype; **RA**: akinetic-rigidity phenotype

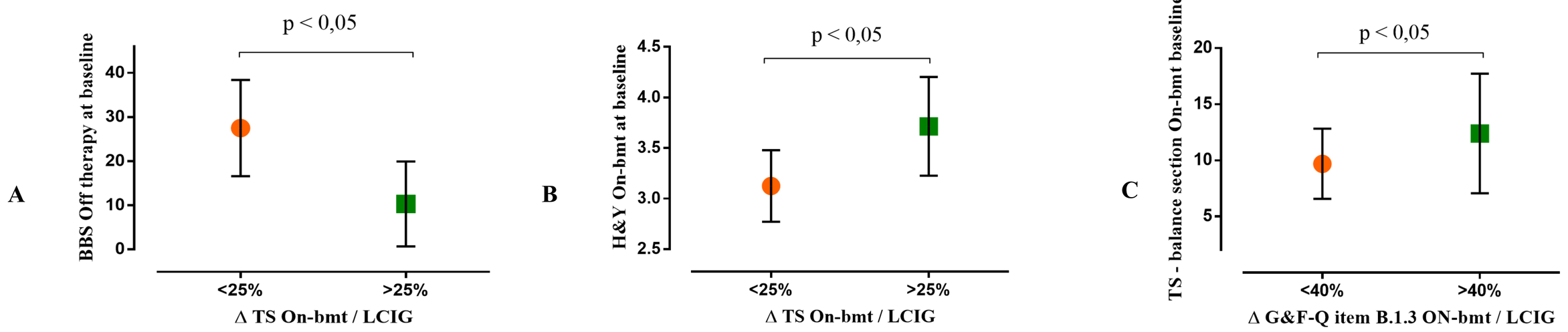

Fig. 2: Outcome predictors according to percentage of improvement in TS and G&F-Q item B.1.3

Results: All patients in LCIG demonstrated improvement in UPDRS III, BBS, TS, G&F-Q, FOG-Q, NFOG-Q subjective reports and in PDQ-8. Entire accelerometer dynamic protocol have been accomplished in 66.7% of cases, because of gait difficulties in off and partial-On bmt. Patients on LCIG showed improvement in performance time in both paths, but with no statistical significance. Chi-square analysis indicated better benefits of LCIG on balance and gait in patients with worsen H&Y and higher fall risk at BBS and TS at the baseline.

Discussion and Conclusions: Our preliminary data confirm efficacy and safety of LCIG on motor symptoms in long term follow up. Also axial symptoms - gait and balance disorders - showed a further improvement in LCIG respect to oral levodopa therapy. These findings suggest that gait disturbances could benefit by a more continuous and stable levodopa administration.

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