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**Objective**

The objective was to investigate the plasma concentration profiles of levodopa and carbidopa and the motor function following a single-dose microtablet administration in Parkinson’s disease patients.

**Introduction**

Assessment of motor function with rating scales in relation to the plasma concentration of levodopa may increase the understanding of how to individualize and fine-tune treatments.

**Methods**

This was a single-center, open-label, single dose study in 19 patients with Parkinson’s disease experiencing motor fluctuations.

- Mean age 71.4 (±6.3) years  
- Years since diagnosis 9.7 (±6.8)  
- 18/19 reported wearing-off symptoms  
- 13/19 reported to experience dyskinesia

- Patients received 150% of their individual levodopa equivalent morning dose in levodopa-carbidopa dispersible microtablets (levodopa [5 mg] and carbidopa [1.25 mg]).
- Blood-samples were collected at pre-specified time points.

All patients were video recorded and the motor function was assessed with three rating scales by three movement disorder specialists blinded with respect to time from dose intake.

The motor function was rated according to (Figure 1):

- six UPDRS motor items  
- Dyskinesia score  
- The Treatment response scale (TRS) score, ranging from parkinsonism (-3) to normal mobility (0) to severe choreatic dyskinesia (+5).

**Results**

**Figure 2. A:** Mean (±SD) baseline- and dose adjusted plasma levodopa concentrations in patients (n=14) and data from healthy (n=18) (data for healthy subjects from Nyholm et al. 2012).  
**B:** Mean baseline- and dose adjusted plasma carbidopa concentrations in patients (n=14) and healthy (n=18) (data for healthy subjects from Nyholm et al. 2012).

**Table 2. Pharmacokinetic parameters of levodopa and carbidopa**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Levodopa</th>
<th>Carbidopa</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Cmax/dose</td>
<td>(µg/mL)</td>
<td>19</td>
</tr>
<tr>
<td>T1/2</td>
<td>(min)</td>
<td>19</td>
</tr>
<tr>
<td>AUC0-4/dose</td>
<td>(min*µg/mL/mg)</td>
<td>14</td>
</tr>
<tr>
<td>t1/2</td>
<td>(min)</td>
<td>14</td>
</tr>
</tbody>
</table>

Mean time to maximum improvement in UPDRS item score was 78 (±59) minutes (n=16), and the mean time to TRS score effect maximum was 54 (±51) minutes (n=15).

Mean time to onset of dyskinesia was 41 (±38) minutes (n=13, excluding 6 patients that did not develop dyskinesia).

**Conclusions**

In a PD population, with a median 9 year of disease duration, following administration of levodopa/carbidopa in fasting state, the Cmax and AUC0-4/dose were found to be higher compared with the levodopa pharmacokinetics in young healthy subjects. Our data our line with previous data showing that pharmacokinetics of levodopa is age dependent.

A large between subject variability in response and duration of effect was observed.

**Reference:**