

Evidence for improved speech production following levodopa medication in idiopathic Parkinson's disease

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This critical review examines current research evidence available concerning speech improvement, specifically considering intelligibility and speaking rate, following the use of levodopa in patients with Parkinson's disease. All studies in the present review employed a within-subject design to compare speech production during on and off medication conditions. Overall, research suggests improved intelligibility and little evidence for improved speaking rate. Due to subject selection and methodological concerns, further research is required to replicate and refine prior findings.

Idiopathic Parkinson's disease is a progressive neurological disease characterized primarily by the progressive death of dopaminergic neurons in the brain, mainly in the substantia nigra (Goberman, Coelho, & Robb, 2002). This loss of dopamine has

a) Discussed levodopa treatment for Parkinson's disease patients; b) outcome measure(s) included intelligibility and/or rate; c) study was published in English.

#### *Data Collection*

The literature search yielded nine articles that were identified and selected for critical review based on the above search criteria. Following a full-text reading of the articles, only six were retained based on relevant outcome measures. All studies retrieved employed a within-subject experimental design.

#### Results

The first study reviewed was by Adelman, Hoel, and Lassman (1970), who included twenty-five patients to investigate the effects of levodopa on speech intelligibility and other speech parameters. All patients read a passage and participated in various speech tasks. Audio tape recordings of their speech were taken four times: upon admission to the hospital, when patients stopped their conventional medication, six weeks after patients began levodopa treatment, and six months after patients began levodopa treatment. All samples were randomized and blindly rated. Selected samples, in addition, were also analyzed using instrumentation. Results were deemed 'preliminary' and indicated an improvement in speech intelligibility following levodopa. A few subjects showed no change while off and on medication.

The second study reviewed was conducted

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- results to compare patients both on and off levodopa.
- b) Assessment of conversational speech samples in a less controlled environment. Is there a difference between reading task performance in a structured setting and conversation performance in a natural environment?
  - c) Comparison of articulation, speech intelligibility, and rate during on and off states of levodopa in patients at different stages of the disease. Does severity of disease influence the amount or lack of improvement?
  - d) Comparison of perceptual evaluations of speech parameters from professionals (i.e., Speech-Language Pathologists) and lay listeners (i.e., untrained listeners).
  - e) Correlation of overall motor function and motor-speech function during on and off levodopa states for articulation, intelligibility, and rate of speaking.
  - f)

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