Evidence Report/Technology Assessment

Number 57

Diagnosis and Treatment of Parkinson's Disease: A Systematic Review of the Literature

Prepared for:
Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services
540 Gaither Road
Rockville, MD 20850
www.ahrq.gov

Contract No: 290-97-0016

Prepared by:
MetaWorks, Inc., Evidence-based Practice Center
Medford, MA

Investigators
Cindy B. Levine, MD
Kyle R. Fahrbach, PhD
Andrew D. Siderowf, MD
Rhonda P. Estok, RN, BSN
Veronica M. Ludensky, BA
Susan D. Ross, MD, FRCPC

AHRQ Publication No. 03-E040
June 2003

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Suggested Citation:
Levine CB, Fahrbach KR, Siderowf AD, et al. Diagnosis and Treatment of Parkinson's Disease: A Systematic Review of the Literature. Evidence Report/Technology Assessment Number 57. (Prepared by Metaworks, Inc., under Contract No. 290-97-0016.) AHRQ Publication No. 03-E040. Rockville, MD: Agency for Healthcare Research and Quality. June 2003.

Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-based Practice Centers (EPCs), sponsors the development of evidence reports and technology assessments to assist public- and private-sector organizations in their efforts to improve the quality of health care in the United States. The reports and assessments provide organizations with comprehensive, science-based information on common, costly medical conditions and new health care technologies. The EPCs systematically review the relevant scientific literature on topics assigned to them by AHRQ and conduct additional analyses when appropriate prior to developing their reports and assessments.

To bring the broadest range of experts into the development of evidence reports and health technology assessments, AHRQ encourages the EPCs to form partnerships and enter into collaborations with other medical and research organizations. The EPCs work with these partner organizations to ensure that the evidence reports and technology assessments they produce will become building blocks for health care quality improvement projects throughout the Nation. The reports undergo peer review prior to their release.

AHRQ expects that the EPC evidence reports and technology assessments will inform individual health plans, providers, and purchasers as well as the health care system as a whole by providing important information to help improve health care quality.

We welcome written comments on this evidence report. They may be sent to: Director, Center for Practice and Technoloy Assessment, Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850.

Carolyn Clancy, M.D.
Director
Agency for Healthcare Research and Quality

Jean Slutsky, P.A., M.S.P.H.
Acting Director, Center for Practice and Technology Assessment
Agency for Healthcare Research and Quality

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Structured Abstract

Objectives. Parkinson's Disease (PD) is estimated to affect over 1 percent of the population over age 65. The objective of this systematic review is to assess the quantity and quality of published evidence regarding diagnosis and treatment of patients with PD.

Search Strategy. English-language literature published from 1990 to 2000 was searched using electronic databases. Searches were supplemented by manually reviewing bibliographies of all accepted studies and selected review articles.

Selection Criteria. Studies were required to evaluate at least 10 human patients and address pre-defined areas of interest. Only randomized controlled trials (RCTs) were accepted for studies regarding pharmacological treatment.

Data Collection and Analysis. Pertinent data were evaluated for quality and level of evidence, extracted from accepted studies by one researcher, and reviewed by a second. Data were summarized and synthesized qualitatively. Meta-analyses were performed, comparing standardized mean changes from baseline to outcome in PD severity rating scales.

Main Results. The database includes 59 studies (3,369 patients) regarding diagnosis, 49 studies (9,968 patients) on pharmacological treatment, 42 studies (1,380 patients) on surgery, 10 studies (392 patients) on psychiatric treatment, and 20 studies (1,049 patients) on ancillary treatment of PD.

PD is diagnosed clinically; evidence does not show that specific tests improve diagnostic accuracy. There is no evidence that different dopamine agonists (DAs) vary in treatment effects. Meta-analysis suggests that in early PD, treatment with DAs plus levodopa (L-dopa) may control PD symptoms better than treatment with L-dopa alone, but this was not a consistent finding. Similarly, no consistent difference in symptom control was found between L-dopa alone and the combination therapy of L-dopa plus selegiline. In patients with advanced disease, treatment with catechol O-methyl transferase (COMT) inhibitors combined with L-dopa provides significantly greater PD symptom control than treatment with L-dopa alone and is associated with lower L-dopa doses; however, long-term (greater than 7 months) results are lacking, and hepatotoxicity is a rare but potentially lethal side effect associated with tolcapone.

For pallidotomy and deep brain stimulation (DBS), endpoint PD scale scores are significantly better than baseline scores. DBS of the subthalamic nucleus (STN) and globus pallidus (GPi) result in significant improvement in PD symptoms, but only STN DBS is associated with decreased L-dopa doses. There are insufficient studies of thalamotomy and tissue transplantation to draw any conclusions regarding their efficacy and safety.

Ancillary treatments, such as physical therapy, improve some symptoms on a short-term basis, but long-term data are lacking. Intensive speech therapy has been shown to improve vocal intensity up to 12 months after treatment; however, long-term results are from only one study of 22 patients.

Conclusions. PD is diagnosed clinically; there is currently no gold standard premorbid diagnostic test for PD. Meta-analyses of different pharmacological treatments showed that the only medication that consistently controlled PD symptoms better than L-dopa alone was the

combination of L-dopa plus COMT inhibitors in patients with advanced PD. Meta-analyses suggest that pallidotomy and DBS result in improvement of PD rating scores. The published literature regarding PD suffers from lack of reporting standardized outcomes.

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