

Parkinson's Disease Current Awareness Bulletin

December 2019

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Title: Unmet needs of people with Parkinson's disease: A cross-sectional study

Citation: Journal of Advanced Nursing; Dec 2019; vol. 75 (no. 12); p. 3504

Author(s): Lee, JuHee; Kim, YonJi; Kim, SungHae; Kim, Yielin; Young Joo Lee; Young Ho Sohn

Aims: To identify the type and extent of unmet needs in people with Parkinson's disease and to examine the impact of health locus of control and family support on these needs.

Design: A cross-sectional study.

Methods: This study was conducted from October 2015 - February 2016 in Korea. Data were collected through questionnaires focusing on unmet needs, health locus of control, family support and clinical features.

Results: Therapeutic needs represented the highest percentage of unmet needs in people with Parkinson's disease (85.05%), followed by social/spiritual/emotional needs (82.72%). Physical needs were the lowest reported score (75.01%). Unmet needs were more frequent in those with more severe non-motor symptoms. Also, higher family support, internal locus of control and doctor locus of control were correlated with more unmet needs.

Conclusion: Understanding factors that determine the type and degree of unmet needs in people with PD is important to provide appropriate nursing care. The findings of this study can be used for providing nursing interventions reflecting unmet needs and reducing their unmet needs to improve the overall well-being of people with PD.

Impact: This study addressed unmet needs specific to Parkinson's disease with respect to their nursing needs. Therapeutic needs were the highest unmet needs in people with PD, followed by social/spiritual/emotional needs, need for certainty and physical needs. The findings may be useful for nurses to identify the unmet needs of people with PD which need to be addressed. By reflecting on unmet needs, nurses can give personally tailored nursing care.

Title: Effect of Expiratory Muscle Strength Training on Swallowing and Cough Functions in Patients With Neurological Diseases: A Meta-analysis.

Citation American Journal of Physical Medicine & Rehabilitation; Dec 2019; vol. 98 (no. 12); p. 1060-1066

Author(s): Wang, Zhuo; Wang, Zhi; Fang, Qi; Li, Huiling; Zhang, Lulu; Liu, Xueyun

Abstract: Supplemental digital content is available in the text. Objective: The aim of this review was to evaluate and summarize the results of published studies exploring the effects of expiratory muscle strength training on swallowing and cough functions in patients with neurological diseases. Data Sources: The study used Embase, PubMed, and the Cochrane Library as data sources. Review Methods: Randomized controlled trials or pretest/posttest studies of adults with neurological diseases were included. The data included basic population characteristics, penetration-aspiration scores, peak expiratory flow rate, cough volume acceleration, and maximum expiratory pressure. Results: Ten studies were included in this meta-analysis. Compared with the control groups, expiratory muscle strength training in patients with neurological diseases significantly reduced the penetration-aspiration scores (risk ratio = -0.94, 95% confidence interval = 1.27 to -0.61, $P < 0.01$) but did not increase the voluntary cough peak expiratory flow rate (risk ratio = 0.57, 95% confidence interval = 0.62 to 1.77, $P = 0.35$), cough volume acceleration (risk ratio = 33.87, 95% confidence interval = 57.11 to 124.85, $P = 0.47$), or maximum expiratory pressure (risk ratio = 14.78, 95% confidence interval = 16.98 to 46.54, $P = 0.36$). Conclusions: Expiratory muscle strength training might improve swallowing function in patients with neurological diseases.

However, conclusive evidence supporting the use of this approach in isolation for improving cough function is unavailable. Additional multicenter, randomized clinical trials performed using reliable and valid cough function outcome measures are required to explore the effects of expiratory muscle strength training on cough function.

Title: Resistance training reduces depressive symptoms in elderly people with Parkinson disease: A controlled randomized study.

Citation: Scandinavian Journal of Medicine & Science in Sports; Dec 2019; vol. 29 (no. 12); p. 1957-1967

Author(s): Lima, Tiago Alencar; Ferreira-Moraes, Renilson; Alves, Wilson Mateus Gomes da Costa; Alves, Thiago Gonçalves Gibson; Pimentel, Clebson Pantoja; Sousa, Evitom Corrêa; Abrahim, Odilon; Cortinhas-Alves, Erik Artur

Background: Depression affects up to 40% of individuals with Parkinson's disease (PD).

Purpose: To assess resistance training effects on the depressive symptoms of elderly PD patients.

Study design: A randomized control study.

Methods: Thirty-three patients (aged ≥ 60 years) were randomly divided into two groups: (a) control group: $n = 16$ and (b) resistance training group (RTG): $n = 17$. All patients with Parkinson's disease (stage 1-3 on the Hoehn and Yahr scale). The RTG, in addition to maintaining their pharmacological treatments, performed 20 weeks of resistance training. The control group maintained their pharmacological treatments. Depressive symptoms, quality of life, unified Parkinson's Disease scale, and functional capacity were evaluated in both groups.

Results: The RTG presented a significant reduction ($P < .05$) of depressive symptoms (pre = 17.9 ± 8 score; post = 10.3 ± 6 score; effect size: -0.48), improved quality of life (pre = 40.3 ± 21.1 score; post = 30.2 ± 16.8 score; effect size: -0.26), and improved UPDRS (pre = 64 ± 34.6 score; post = 49.1 ± 24.1 score; effect size: -0.24). No significant changes in the control group regarding depressive symptoms (pre = 18.7 ± 5.4 score; post = 19.4 ± 5.2 score; effect size: 0.07), quality of life (pre = 39 ± 16.1 score; post = 40.6 ± 15.6 score; effect size: 0.05), and UPDRS (pre = 61.1 ± 24.3 score; post = 64.9 ± 23.4 score; effect size: 0.08) after 20 weeks.

Conclusion: Resistance training reduces depressive symptoms and improves the quality of life and functionality of elderly with PD.

Title: Effect of Parkinson's disease on primary total joint arthroplasty outcomes: A meta-analysis of matched control studies.

Citation: International Journal of Surgery; Nov 2019; vol. 71 ; p. 124-131

Author(s): Min, Huan; Lin, Hui; Chen, Gang

Background: Currently, no meta-analysis exists elucidate the outcomes of total joint arthroplasty (TJA) in patients with Parkinson's disease (PD). The aim of this study was to investigate the outcomes of TJA in patients with PD with respect to complication and revision in comparison to a TJA cohort without PD.

Methods: MEDLINE, Scopus, EMBASE, and Cochrane Library databases were searched with English language restrictions. The primary outcome measures were complications and revision, whereas the secondary outcomes included length of stay (LOS) and total charge.

Results: Seven studies with a total of 124163 patients were included. The most important finding from our study was that PD patients had a 42% higher risk for any medical complication ($P = 0.004$) and a 65% higher risk for any surgical complication ($P = 0.01$) compared to the matched cohort. Specifically, PD was associated with increased superficial wound infection ($P = 0.006$), dislocation ($P = 0.01$), deep vein thrombosis (DVT) ($P = 0.02$), LOS ($P = 0.0005$), and total hospital charges ($P < 0.00001$). However, PD did not increase the risks for periprosthetic infection ($P = 0.32$) and revision ($P = 0.17$).

Conclusions: Patients with PD are at increased risk for medical complication and surgery complications, particularly superficial wound infection, dislocation, and DVT as compared to patients without PD. PD patients also exhibit increased LOS and total hospital charges. However, PD did not increase the risks for periprosthetic infection and revision.

Title: Efficacy of nicergoline treatment in Parkinson's disease associated with dementia.

Citation: Journal of clinical neuroscience : official journal of the Neurosurgical Society of Australasia; Dec 2019; vol. 70 ; p. 136-139

Author(s): Lee, Sujin; Na, Seung-Hee; Chung, Yong-An; Jeong, HyeonSeok; Song, In-Uk

Abstract: Parkinson's disease (PD) has a variable spectrum of cognitive impairment. However, there are no clear evident-based management guidelines for PD with dementia (PDD). Alternative treatments for PDD are therefore required. We conducted this longitudinal study to evaluate the efficacy of nicergoline in treating PDD by analyzing changes in regional cerebral blood flow (rCBF) and neuropsychological tests before and after nicergoline administration. A total of nine PDD patients who received nicergoline therapy (PDD + N) and 14 PD patients who did not receive nicergoline therapy (PDD - N) underwent single photon emission computed tomography (SPECT) and clinical assessments at baseline and 12-month follow-up visits. The PDD + N received nicergoline at 30 mg twice per day. Changes in rCBF were compared between the groups, and correlation analysis was performed to determine possible relationship between rCBF and clinical characteristics. There were no significant differences in rCBF between the two groups at baseline. Although changes in cognitive test scores and the motor severity scale were not significantly different between baseline and the 12-month follow-up within groups, rCBF was lower in both the temporal and inferior frontal restricted areas in the PDD - N group than the PDD + N at the 12-month follow-up visit. In conclusions, nicergoline appears to delay the speed of deterioration of cognitive function in patients with PDD based on our observation of decreased rCBF in the temporal regions and inferior frontal regions of PDD - N patients compared to PDD + N patients after 12-month of nicergoline therapy. Therefore, we cautiously suggest that nicergoline administration in PDD patients may slow progression of cognitive impairment in affected brain regions.

Title: Potential new therapies against a toxic relationship: neuroinflammation and Parkinson's disease.

Citation: Behavioural pharmacology; Dec 2019; vol. 30 (no. 8); p. 676-688

Author(s): Rodrigues, Lais S; Fagotti, Juliane; D S Targa, Adriano; D Nosedá, Ana Carolina; L Ilkiwa, Jéssica; Chuproski, Ana Paula; W C Dorieux, Flavia; D Dos Santos, Patricia; M S Lima, Marcelo

Abstract: Parkinson's disease (PD) is a neurodegenerative disorder classically associated with motor symptoms, but several nonmotor disturbances appear decades before the clinical diagnosis of the disease. A variety of hypotheses exist to explain the onset of PD, and neuroinflammation is one of the most investigated processes. In fact, strong evidence suggests that PD begins with an inflammatory process; currently, however, no anti-inflammatory therapy is clinically employed to alleviate the typical motor and the prodromal disturbances such as olfactory loss, cognitive impairments, depression and anxiety, sleep disturbances, and autonomic disorders. In fact, the classical dopaminergic therapies are not effective in alleviating these symptoms and there is no other specific therapy for these outcomes. Therefore, in this review, we will discuss novel potential pharmacological therapeutic strategies focusing on cannabinoids, caffeine, melatonin, and dietary compounds, which could act as adjuvants to regular PD therapy. These described chemicals have been extensively investigated as anti-inflammatory agents possibly promoting beneficial effects on nonmotor symptoms of PD. The investigation of the inflammatory process at different stages of PD progression should give us a better view of the therapeutic scenario and could improve our understanding of the mechanisms of this disease.

Title: Power vs strength training to improve muscular strength, power, balance and functional movement in individuals diagnosed with Parkinson's disease.

Citation: Experimental gerontology; Dec 2019; vol. 128 ; p. 110740

Author(s): Cherup, Nicholas P; Buskard, Andrew N L; Strand, Keri L; Roberson, Kirk B; Michiels, Emma R; Kuhn, Jessica E; Lopez, Francisco A; Signorile, Joseph F

Background: Declines in strength and power are cardinal symptoms of Parkinson's disease (PD), a progressive neuromuscular disorder. Progressive resistance training (PRT) has been shown to reduce a wide variety of PD-related motor deficits; however, no study has examined differences between the two most common RT methodologies utilized in this population, high-load, low velocity strength training (ST) and low-load, high-velocity power training (PT). The primary purpose of this study was to compare the effects of ST and PT on measures of strength, power, balance and functional movement in persons with PD.

Method: Thirty-five persons with mild to moderate PD (Hoehn and Yahr Stages = 1-3; UPDRS Part III = 30.6 ± 14.0) were randomized into either a ST or PT group involving 12 weeks of supervised PRT (2 visits per week). Leg press (LP) and chest press (CP) muscular strength (1RM) and muscular peak power (PP) were assessed before and after the twelve week training period as primary outcome measures. In addition, secondary measures of balance (Berg Balance Assessment (BBA), dynamic posturography (DMA), Modified Falls Efficacy Scale (MFES)), functional movement (timed up-and-go), and quality of life (PDQ-39 summary index and Mobility subscore) were obtained at the same time points, given the impact of PD symptoms on fall probability and independence.

Results: Repeated measures ANCOVA revealed significant improvements in LP 1RM (Mdiff = 54.89 kg, 95% CI: 43.38, 66.40; $p < .05$; $d = 3.38$) and CP 1RM (Mdiff = 7.33 kg, 95% CI: 4.75, 9.91; $p < .05$; $d = 2.02$). Additionally, significant improvements were seen in LPPP (Mdiff = 112.27 W, 95% CI: 56.03, 168.51; $p < .05$; $d = 1.42$) and CPPP (Mdiff = 52.1 W, 95% CI: 23.38, 80.86; $p = .001$; $d = 1.29$). No significant improvements were seen for any secondary outcome measures, however BBA scores were shown to significantly decrease following the intervention (Mdiff = -1.686, 95% CI: -2.89, -0.482; $p = .007$ $d = -0.96$), although this change did not reach clinical significance (clinically meaningful change = ± 4.0). In addition, the ST group demonstrated significantly poorer PDQ-39SI scores (Mdiff = 4.96, 95% CI: 0.54, 9.38; $p = .029$), whereas the entire sample showed significantly poorer PDQ-39MOB scores (Mdiff = 4.80, 95% CI: 0.17, 9.43; $p = .043$; $d = 0.71$).

Conclusions: Both ST and PT appear to be effective at reducing the neuromuscular deficits associated with PD; however, the use of these interventions for improving functional performance was not supported.

Title: Pain in persons with mild-moderate Parkinson's disease: a cross-sectional study of pain severity and associated factors.

Citation: International journal of rehabilitation research. Internationale Zeitschrift fur Rehabilitationsforschung. Revue internationale de recherches de readaptation; Dec 2019; vol. 42 (no. 4); p. 371-376

Author(s): Joseph, Conran; Jonsson-Lecapre, Jondi; Wicksell, Rikard; Svenningsson, Per; Franzén, Erika

Abstract: The aims of this study were to determine pain severity in persons with mild-moderate Parkinson's disease compared with healthy age- and sex-matched controls, and identify related factors, that is, demographic, disease severity, and functioning, of pain severity in the Parkinson's disease group. A cross-sectional study design was adopted to assess pain severity in 100 persons with Parkinson's disease and 47 healthy controls. Bodily pain was assessed using item 21 of the Short Form 36, whereas pain severity was determined using the entire Short Form 36 Bodily Pain subscale (score ranging from 0 to 100). Self-report questionnaires and clinical tests were completed to determine factors, that is, demographic and disease severity characteristics as well as physical functioning indicators, related to pain severity. Based on fulfillment of assumptions of data normality, both univariate and multivariate regression analysis were carried out. Pain severity ($P < 0.001$) was significantly higher in persons with Parkinson's disease than healthy controls. Among persons with Parkinson's disease, the multivariate predictor model, explaining 34% of the variance in pain severity scores, identified three independently associated factors. Poorer balance performance, a shorter disease duration, and poorer health-related quality of life were independently associated with pain severity. Pain severity is higher in those living with Parkinson's disease than controls, and severity appears to be associated with disease characteristics and overall health. Further research is required to assess pain origin in Parkinson's disease with the aim of developing targeted interventions.

Title: Measures of balance and falls risk prediction in people with Parkinson's disease: a systematic review of psychometric properties.

Citation: Clinical rehabilitation; Dec 2019; vol. 33 (no. 12); p. 1949-1962

Author(s): Winser, Stanley J; Kannan, Priya; Bello, Umar Muhhamad; Whitney, Susan L

Objective: To investigate the psychometric properties of measures of balance and falls risk prediction in people with Parkinson's disease (PD).

Data Sources: PubMed, Embase, CINAHL, Ovid Medline, Scopus, and Web of Science were searched from inception to August 2019.

Review Method: Studies testing psychometric properties of measures of balance and falls risk prediction in PD were included. The four-point COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) assessed quality.

Results: Eighty studies testing 68 outcome measures were reviewed; 43 measures assessed balance, 9 assessed falls risk prediction, and 16 assessed both. The measures with robust psychometric estimation with acceptable properties were the (1) Mini-Balance Evaluation Systems Test (Mini-BEST), (2) Berg Balance Scale, (3) Timed Up and Go test,

(4) Falls Efficacy Scale International, and (5) Activities-Specific Balance Confidence scale. These measures assess balance and falls risk prediction at the body, structure and function level, falls risk and balance, and falls risk at the activity level. The motor examination of the Unified Parkinson's Disease Rating Scale (UPDRS-ME) with robust psychometric analysis is a condition-specific measure with acceptable properties. Except the UPDRS-ME and Mini-BESTest, the responsiveness of the other four measures has yet to be established.

Conclusion: Six of the 68 outcome measures have strong psychometric properties for the assessment of balance and falls risk prediction in PD. Measures assessing balance and falls risk prediction at the participatory level are limited in number with a lack of psychometric validation.

Title: Bright light therapy with a head-mounted device for anxiety, depression, sleepiness and fatigue in patients with Parkinson's disease.

Citation: Acta neurologica Belgica; Dec 2019; vol. 119 (no. 4); p. 607-613

Author(s): Raymackers, Jean-Marc; Andrade, Mariana; Baey, Eugénie; Vanneste, Margaux; Evrard, Frédéric

Abstract: The beneficial effects of bright light therapy (BLT) on the disabling non-motor symptoms of Parkinson's disease (PD) remain uncertain. The objective of this study was to investigate if daily BLT, with a head-mounted device (Luminette®), has a beneficial effect on depression, anxiety, daytime sleepiness and fatigue in patients with PD. In this double-blind, placebo-controlled study, 16 patients with PD were randomized to receive either 1 month of BLT or 1 month of placebo therapy, separated by a 2-week washout period, in a crossover fashion. Patients completed questionnaires for the Hospital Anxiety and Depression Scale (HADS), the Epworth Sleepiness Scale (ESS) and the Fatigue Impact Scale (FIS) before and after each treatment period. The primary outcome measures were changes from baseline in scores between treatment groups. No significant changes were observed in the HADS anxiety scores and FIS scores after BLT and after placebo. The ESS scores decreased non-significantly only after BLT. A post hoc analysis of patients who had baseline ESS scores > 11 revealed a significantly greater decrease in ESS scores after BLT than after placebo. Future studies investigating the effect of BLT on sleepiness could focus specifically on patients with high ESS scores.

Title: The effects of exercise interventions on Parkinson's disease: A Bayesian network meta-analysis.

Citation: Journal of clinical neuroscience : official journal of the Neurosurgical Society of Australasia; Dec 2019; vol. 70 ; p. 47-54

Author(s): Tang, Lijun; Fang, Yingjie; Yin, Jianchun

Objective: This work aimed to assess effects of different exercise intervention on Parkinson's disease (PD) treatment via a network meta-analysis.

Methods: Eligible literatures were retrieved from three databases (PubMed, EMBASE and Cochrane Library) up to March 5, 2019 and screened based on established selection criteria. Afterwards, relevant data was extracted and heterogeneity tests were conducted to select appropriate effect models according to chi-square test and I² statistics. Publication bias of included studies was also performed. Finally, the pairwise and network meta-analyses were carried out to evaluate the efficacy of different exercise training on PD management.

Results: Overall, 19 studies encompassing 920 PD patients were identified to explore effects of interventions such as dance, Qigong, tango, resistance training (RT), Taichi and yoga on PD in terms of six indicators including six-minute walk, gait velocity, UPDRS III, PD questionnaire-39 (PDQ-39), timed up and go (TUG) and Berg balance test (BBT). The direct meta-analysis revealed that RT and dance altered the gait velocity and PDR-39 indicator of PD patients. And there was a statistical difference in RT and Tango regarding UPDRS III. Besides, significant differences were also detected among multiple comparisons based on TUG and BBT, containing RT vs control, Tai Chi vs control and Tango vs control for TUG, and dance vs control for BBT. Finally, results of network meta-analysis implied that tango was a good exercise for PD patients according to six different outcome measures.

Conclusion: Tango was an optimal and effective option for improving functional mobility of PD patients.

Title: Swallowing speed is no adequate predictor of aspiration in Parkinson's disease.

Citation: Neurogastroenterology and motility : the official journal of the European Gastrointestinal Motility Society; Dec 2019; vol. 31 (no. 12); p. e13713

Author(s): Pflug, Christina; Niessen, Almut; Buhmann, Carsten; Bihler, Moritz

Background: There is still a lack of a clinical test to reliably identify patients with Parkinson's disease (PD) being at risk for aspiration.

Methods: In this prospective, controlled, cross-sectional study, we assessed if swallowing speed for water is a useful clinical test to predict aspiration proven by flexible endoscopic evaluation of swallowing (FEES). Due to this, we measured the swallowing speed for 90 mL water in 115 consecutive and unselected PD outpatients of all clinical stages and 32 healthy controls.

Key Results: Average swallowing speed was lower in patients compared with controls (6.5 ± 3.9 mL/s vs 8.5 ± 3.2 mL/s; $P < .01$). The disease-independent widely used threshold of <10 mL/s showed insufficient sensitivity of 88% and specificity of 19% with high false-positive rates of 63% for patients and 69% for controls. Receiver operating characteristic (ROC) analysis was carried out to define a suitable cutoff value for detection of aspiration of water (area under the curve 0.72, $P < .001$) in PD patients. The optimized cutoff value was 5.5 mL/s with a sensitivity of 69% and a specificity of 64%.

Conclusion and Inferences: Measuring swallowing speed is prone to methodological errors and not suitable as a screening instrument to predict aspiration in PD patients.

Title: Immunotherapy in Parkinson's disease: Current status and future directions.

Citation: Neurobiology of disease; Dec 2019; vol. 132 ; p. 104587

Author(s): Chatterjee, Diptaman; Kordower, Jeffrey H

Abstract: Immunotherapeutic approaches for the treatment of Parkinson's disease (PD) and related synucleinopathies have steadily developed over the last two decades with several iterations currently being tested in clinical trials. Although classically characterized as a movement disorder, PD is also defined clinically by numerous non-motor features that can precede the motor manifestations and span across several decades of disease progression. Pathologically, PD is characterized by proteinaceous inclusions that largely consist of misfolded and aggregated forms of the protein, alpha-synuclein. Recent research has proposed that alpha-synuclein pathology is capable of propagating from cell-to-cell, and thus, may cause the clinical progression of the disease. Antibody-based therapies are ideal

drugs to theoretically target pathological proteins, especially those located in the extracellular space. Several other targeting strategies have been developed to indirectly mitigate the propagation of alpha-synuclein and are in various stages of pre-clinical and clinical development. In this review, we discuss the current status of development for immunotherapies in PD as well as the primary challenges that must be hurdled to bring an effective immunotherapeutic drug to market.

Title: Potential predictors of quality of life in Parkinson's Disease: Sleep and mood disorders.

Citation: Journal of clinical neuroscience : official journal of the Neurosurgical Society of Australasia; Dec 2019; vol. 70 ; p. 113-117

Author(s): Palmeri, Rosanna; Lo Buono, Viviana; Bonanno, Lilla; Sorbera, Chiara; Cimino, Vincenzo; Bramanti, Placido; Di Lorenzo, Giuseppe; Marino, Silvia

Abstract: Sleep Disturbances are a non motor symptom very common in Parkinson's Disease characterized by insomnia, worse quality of sleep and Excessive Daytime Sleepiness. Several factors have been associated with these disorders, especially neuropsychiatric symptoms, such as anxiety and depression. The aim of the study was to investigate the relationship between sleep quality and mood disorders and the effects on Quality of Life in Parkinson's Disease patients. We have enrolled 48 Parkinson's Disease patients divided in two group according to their quality of sleep. All of them completed standardized questionnaires such as Beck Depression Inventory, Hamilton Anxiety Rating Scale, Parkinson Disease Questionnaire, Epworth Sleepiness Scale, Pittsburgh Sleep Quality Index. Inter-group analysis showed a significant difference among two groups in anxiety, depression, excessive daytime sleepiness and quality of sleep. Sleep problems, excessive daytime sleepiness, depressive and anxiety symptoms are frequent in PD patients and are significantly associated each other.

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unmet needs to improve the overall well-being of people with PD.IMPACTThis study addressed unmet needs unmet needs specific to Parkinson's disease with respect to their nursing needs. Therapeutic needs were the highest unmet needs in people with PD, followed by social/spiritual/emotional needs, need for certainty and physical needs. The findings may be useful for nurses to identify the unmet needs of people with PD which need to be addressed. By reflecting on unmet needs, nurses can give personally tailored nursing care.

Title: Phytotherapy in treatment of Parkinson's disease: a review.

Citation: Pharmaceutical biology; Dec 2019; vol. 57 (no. 1); p. 355-362

Author(s): Rabiei, Zahra; Solati, Kamal; Amini-Khoei, Hossein

Context: Parkinson's disease (PD) is a neurodegenerative disorder due to gradual loss of dopaminergic nerves in the substantia nigra (SN) in the midbrain. PD leads to certain motor disorders including resting tremor, muscle stiffness and slow movement. Medicinal plants have shown positive pharmacological effects in treating different models of PD.

Objective: Tendency to use natural products, especially plants, for the treatment of PD has been growing. This article reviews the basic aspects of medicinal plants and their bioactive compounds that could be used to treat PD.

Methods: Reliable articles indexed in databases ISI, SID, PubMed, PubMed Central, Scopus and Web of Science were used. A total of 12 plant-derived active ingredients and 18 herbal extracts were included. Different compounds have so far been isolated from plants that affect PD especially by targeting pathways associated with the pathogenesis of the disease.

Results: Although some herbal extracts such as *Hibiscus asper* Hook. f. (Malvaceae), *Ginkgo biloba* L. (Ginkgoaceae), *Carthamus tinctorius* L (Asteraceae) and certain active ingredients, such as berberine and curcumin, have shown positive effects in animal models of PD, potential active ingredients and mechanisms of action should be investigated in additional studies.

Discussion and Conclusions: Despite the wide variety of plants in the world, a limited number of them have been studied for anti-Parkinsonian activity, and therefore, there are numerous perspectives in this field for future studies on plants and their bioactive compounds.

Sources Used:

The following databases are searched on a regular basis in the development of this bulletin: Amed, British Nursing Index, Cinahl, Medline

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