**Supplemental Materials:**

***Supplemental table 1:*** *Search Terms Utilized*

[*((fecal microbiota transplant) OR (fmt) AND (parkinsons)*](https://pubmed.ncbi.nlm.nih.gov/?term=%28%28fecal+microbiota+transplant%29+OR+%28fmt%29+AND+%28parkinsons%29)*)*

***Supplemental table 2****: average quality assessment scores for each study*

|  |  |  |  |
| --- | --- | --- | --- |
| Author/Year | Kuai 2021 | Segal 2021 | Xue 2020 |
| 1. Was the study question or objective clearly stated? | 1 | 1 | 1 |
| 2. Was the study population clearly and fully described, including a case definition? | 1 | 1 | 1 |
| 3. Were the cases consecutive? | 1 | 1 | 1 |
| 4. Were the subjects comparable? | 0 | 0 | 1 |
| 5. Was the intervention clearly described? | 1 | 1 | 1 |
| 6. Were the outcome measures clearly defined, valid, reliable, and implemented consistently across all study participants? | 1 | 0 | 1 |
| 7. Was the length of follow-up adequate? | 0 | 0 | 0 |
| 8. Were the statistical methods well-described? | 1 | 0 | 1 |
| 9. Were the results well-described? | 1 | 1 | 1 |
| Total quality (total number of Yes) | 7 | 5 | 7 |
| Quality (7-9 yes: Good; 4-6 yes: Fair; 1-3 yes: Poor) | good | fair | good |

*Supplemental table 3:* Excluded Studies

|  |
| --- |
| **PubMed** |
| Microbiota-Brain-Gut Axis and Neurodegenerative Diseases |
| The role of microbiota-gut-brain axis in neuropsychiatric and neurological disorders |
| Motor assessment in Parkinson`s disease |
| A Comprehensive Review on the Role of the Gut Microbiome in Human Neurological Disorders |
| The role of the microbiota-gut-brain axis in neuropsychiatric disorders |
| Fecal microbiota transplantation in disease therapy |
| Fecal Microbiota Transplantation in Neurological Disorders |
| Dysbiosis of gut microbiota and microbial metabolites in Parkinson's Disease |
| Fecal microbiota transplantation protects rotenone-induced Parkinson's disease mice via suppressing inflammation mediated by the lipopolysaccharide-TLR4 signaling pathway through the microbiota-gut-brain axis |
| Neuroprotective effects of fecal microbiota transplantation on MPTP-induced Parkinson's disease mice: Gut microbiota, glial reaction and TLR4/TNF-α signaling pathway |
| The role of gut dysbiosis in Parkinson's disease: mechanistic insights and therapeutic options |
| Gut microbiota: A player in aging and a target for anti-aging intervention |
| Gastrointestinal dysfunction in Parkinson's disease: molecular pathology and implications of gut microbiome, probiotics, and fecal microbiota transplantation |
| Influence of gut microbiota on neuropsychiatric disorders |
| Gut dysbiosis, defective autophagy and altered immune responses in neurodegenerative diseases: Tales of a vicious cycle |
| Fecal Microbiota Transplantation: A New Therapeutic Attempt from the Gut to the Brain |
| Gut Microbiota: A Novel Therapeutic Target for Parkinson's Disease |
| Neuroprotection of Fasting Mimicking Diet on MPTP-Induced Parkinson's Disease Mice via Gut Microbiota and Metabolites |
| Molecular Immune Mechanism of Intestinal Microbiota and Their Metabolites in the Occurrence and Development of Liver Cancer |
| Brain-gut-microbiota axis in Parkinson's disease: A historical review and future perspective |
| Dysbiosis is one of the risk factor for stroke and cognitive impairment and potential target for treatment |
| New Avenues for Parkinson's Disease Therapeutics: Disease-Modifying Strategies Based on the Gut Microbiota |
| Composition of intestinal flora affects the risk relationship between Alzheimer's disease/Parkinson's disease and cancer |
| Association of Parkinson's Disease With Microbes and Microbiological Therapy |
| Gut microbiome a promising target for management of respiratory diseases |
| Current and future applications of fecal microbiota transplantation for children |
| 4-[18F]Fluoro- l- m-tyrosine |
| Parkinson's Disease: The Emerging Role of Gut Dysbiosis, Antibiotics, Probiotics, and Fecal Microbiota Transplantation |
| Fecal Microbiota Transplantation and Its Usage in Neuropsychiatric Disorders |
| Fecal Microbiota Transplantation: Current Applications, Effectiveness, and Future Perspectives |
| 6-[18F]Fluoro-l-m-tyrosine. |
| The Interplay between Gut Microbiota and Parkinson's Disease: Implications on Diagnosis and Treatment |
| Gut Microbiota and Parkinson's Disease: Implications for Faecal Microbiota Transplantation Therapy |
| Gut Microbiota Regulation and Their Implication in the Development of Neurodegenerative Disease |
| Fecal Microbiota Transplantation: A Microbiome Modulation Technique for Alzheimer's Disease |
| Fecal microbiota transplantation broadening its application beyond intestinal disorders |
| \*Role of Gastrointestinal Dysbiosis and Fecal Transplantation in Parkinson's Disease |
| Gut microbiota: Implications in Parkinson's disease |
| Genetic and environmental factors in Alzheimer's and Parkinson's diseases and promising therapeutic intervention via fecal microbiota transplantation |
| Designing fecal microbiota transplant trials that account for differences in donor stool efficacy |
| The contribution of the gut microbiome to neurodevelopment and neuropsychiatric disorders |
| The Role of The Gut Microbiome in Parkinson's Disease |
| \*Microbial treatment: the potential application for Parkinson's disease |
| Modification of the gut microbiome to combat neurodegeneration |
| Fecal Microbiota Transplantation as a Tool for Therapeutic Modulation of Non-gastrointestinal Disorders |
| The Role of the Gut Microbiota in the Pathogenesis of Parkinson's Disease |
| Update to the Treatment of Parkinson's Disease Based on the Gut-Brain Axis Mechanism |
| Influence of Commensal Microbiota on the Enteric Nervous System and Its Role in Neurodegenerative Diseases |
| Do the Bugs in Your Gut Eat Your Memories? Relationship between Gut Microbiota and Alzheimer's Disease |
| [Advances in fecal microbiota transplantation for treatment of Parkinson's disease] |
| Curcumin-driven reprogramming of the gut microbiota and metabolome ameliorates motor deficits and neuroinflammation in a mouse model of Parkinson's disease |
| Gut brain axis: an insight into microbiota role in Parkinson's disease |
| Modulation of the Microbiome in Parkinson's Disease: Diet, Drug, Stool Transplant, and Beyond |
| A review of the preclinical and clinical studies on the role of the gut microbiome in aging and neurodegenerative diseases and its modulation |
| Fecal Microbiota Transplantation Exerts a Protective Role in MPTP-Induced Parkinson's Disease via the TLR4/PI3K/AKT/NF-κB Pathway Stimulated by α-Synuclein |
| Changes in the intestinal microbiota of patients with Parkinson's disease and their clinical significance |
| Faecal Transplantation, Pro- and Prebiotics in Parkinson's Disease; Hope or Hype? |
| A New Concept of Associations between Gut Microbiota, Immunity and Central Nervous System for the Innovative Treatment of Neurodegenerative Disorders |
| \*\*Fecal microbiome transplantation attenuates manganese-induced neurotoxicity through regulation of the apelin signaling pathway by inhibition of autophagy in mouse brain |
| Recent advances in PET imaging for evaluation of Parkinson's disease |
| Exploring the Connection Between the Gut Microbiome and Parkinson's Disease Symptom Progression and Pathology: Implications for Supplementary Treatment Options |
| The Role of Fecal Microbiota Transplantation in the Treatment of Neurodegenerative Diseases: A Review |
| Upper Limb Outcome Measures Used in Stroke Rehabilitation Studies: A Systematic Literature Review |
| Gut microbiota relieves inflammation in the substantia nigra of chronic Parkinson's disease by protecting the function of dopamine neurons |
| The gut microbiome in human health and disease-Where are we and where are we going? A bibliometric analysis |
| PET tracers for imaging of the dopaminergic system |
| Episodic memory in progressive supranuclear palsy: a neuropsychological and neuroimaging study |
| Helicobacter hepaticus augmentation triggers Dopaminergic degeneration and motor disorders in mice with Parkinson's disease |
| An altered microbiome in a Parkinson's disease model Drosophila melanogaster has a negative effect on development |
| Age-Matching in Pediatric Fecal Matter Transplant |
| Production of 6-l-[18F]Fluoro-m-tyrosine in an Automated Synthesis Module for 11C-Labeling. |
| Self-perception and determinants of color vision in Parkinson's disease |
| Gut microbiota-mediated protection against influenza virus subtype H9N2 in chickens is associated with modulation of the innate responses |
| tACS Phase Locking of Frontal Midline Theta Oscillations Disrupts Working Memory Performance |
| Commensal gut microbiota can modulate adaptive immune responses in chickens vaccinated with whole inactivated avian influenza virus subtype H9N2 |
| Gut Microbial Metabolites in Parkinson's Disease: Implications of Mitochondrial Dysfunction in the Pathogenesis and Treatment |
| Symptoms of depression in patients with mild cognitive impairment in Parkinson's disease |
| Subregional 6-[18F]fluoro-ʟ-m-tyrosine uptake in the striatum in Parkinson's disease |
| Depressive Symptoms Are Associated With Color Vision but not Olfactory Function in Patients With Parkinson's Disease |
| Longitudinal study of striatal aromatic l-amino acid decarboxylase activity in patients with idiopathic rapid eye movement sleep behavior disorder |
| The gut microbiota attenuate neuroinflammation in manganese exposure by inhibiting cerebral NLRP3 inflammasome |
| The time course of metabolites in human plasma after 6-[(18)F]fluoro-l-m-tyrosine administration |
| Preclinical substantia nigra dysfunction in rapid eye movement sleep behaviour disorder |
| 6-[18F]fluoro-L-m-tyrosine: metabolism, positron emission tomography kinetics, and 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine lesions in primates. |
| Photoreceptor layer thinning in idiopathic Parkinson's disease |
| Comparison of [18F]FDOPA, [18F]FMT and [18F]FECNT for imaging dopaminergic neurotransmission in mice. |
| Corrigendum: The Role of the Gut Microbiota in the Pathogenesis of Parkinson's Disease |
| Color vision in Parkinson's disease and essential tremor |
| Differences between diabetic and non-diabetic patients with community-acquired pneumonia in primary care in Spain |
| Progress of visual dysfunction in Parkinson's disease |
| Clinically relevant effects of convection-enhanced delivery of AAV2-GDNF on the dopaminergic nigrostriatal pathway in aged rhesus monkeys |
| Rapid improvement in Alzheimer's disease symptoms following fecal microbiota transplantation: a case report |
| A dual-tracer study of extrastriatal 6-[18F]fluoro-m-tyrosine and 6-[18F]-fluoro-L-dopa uptake in Parkinson's disease. |
| Comparative assessment of 6-[18 F]fluoro-L-m-tyrosine and 6-[18 F]fluoro-L-dopa to evaluate dopaminergic presynaptic integrity in a Parkinson's disease rat model. |
| Monitoring of a progressive functional dopaminergic deficit in the A53T-AAV synuclein rats by combining 6-[18F]fluoro-L-m-tyrosine imaging and motor performances analysis. |
| Freezing of Gait in Parkinson's Disease Is Associated with Reduced 6-[(18)F]Fluoro-l-m-tyrosine Uptake in the Locus Coeruleus. |
| Tremor is associated with PET measures of nigrostriatal dopamine function in MPTP-lesioned monkeys |
| Motor impairment influences Farnsworth-Munsell 100 Hue test error scores in Parkinson's disease patients |
| Safety and tolerability of putaminal AADC gene therapy for Parkinson disease |
| Functional effects of AAV2-GDNF on the dopaminergic nigrostriatal pathway in parkinsonian rhesus monkeys |
| A Practical One-Pot Synthesis of Positron Emission Tomography (PET) Tracers via Nickel-Mediated Radiofluorination |
| Noninvasive assessment of aromatic L-amino acid decarboxylase activity in aging rhesus monkey brain in vivo |
| Comparison of two methods for the analysis of [18F]6-fluoro-L-m-tyrosine PET data |
| A phase I study of aromatic L-amino acid decarboxylase gene therapy for Parkinson's disease |
| A dose-ranging study of AAV-hAADC therapy in Parkinsonian monkeys |
| Colour vision abnormalities do not correlate with dopaminergic nigrostriatal degeneration in Parkinson's disease |
| Overlesioned hemiparkinsonian non human primate model: correlation between clinical, neurochemical and histochemical changes |
| PET imaging in rats to discern temporal onset differences between 6-hydroxydopamine and tau gene vector neurodegeneration models |
| Coenzyme Q10 supplementation provides mild symptomatic benefit in patients with Parkinson's disease |
| Results from a phase I safety trial of hAADC gene therapy for Parkinson disease |
| A novel MPTP primate model of Parkinson's disease: neurochemical and clinical changes |
| Distorted colour discrimination in Parkinson's disease is related to severity of the disease |
| Long-term clinical improvement in MPTP-lesioned primates after gene therapy with AAV-hAADC |
| Dopamine transporter loss and clinical changes in MPTP-lesioned primates |
| Positron emission tomography with 4-[18F]fluoro-L-m-tyrosine in MPTP-induced hemiparkinsonian monkeys |
| A probe for intracerebral aromatic amino-acid decarboxylase activity: distribution and kinetics of [18F]6-fluoro-L-m-tyrosine in the human brain |
| **Cochrane** |
| Fecal microbiota transplantation for the treatment of recurrent *Clostridium difficile (Clostridium difficile)* |
| Fecal transplantation for treatment of inflammatory bowel disease |
| Symbiotic, prebiotics and probiotics for solid organ transplant recipients |

***Supplemental table 4: Preferred Reporting Items for Systematic Reviews and Meta-Analyses*[30]**

**A flowchart of information

Description automatically generated with low confidence**