The Effects of Rivastigmine on Neuropsychiatric Symptoms in the Early Stages of Parkinson's Disease: A Systematic Review

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Aims. Neuropsychiatric symptoms including depression, apathy and psychosis are experienced by the majority of patients with Parkinson's disease. A subgroup of patients develop cognitive impairment, which may increase the risk of falls due to reduced attention. Acetylcholine deficit is thought to contribute to neuropsychiatric symptoms in Parkinson's disease. The acetylcholinesterase inhibitor rivastigmine is beneficial in Parkinson's disease dementia (PDD), but the consensus for the use of rivastigmine earlier in the disease course is unclear. This systematic review aims to assess the evidence for rivastigmine in the treatment of neuropsychiatric symptoms in Parkinson's disease without dementia.
Methods. EMBASE, MEDLINE, PsychINFO, Cochrane CENTRAL, NGLC, NICE Evidence and medRxiv.org were searched for studies with terms relating to Population (Parkinson's disease) and intervention (rivastigmine).

1922 references were identified, of which 358 were duplications.

Inclusion criteria were: diagnosis of Parkinson's disease, rivastigmine intervention and the presence of neuropsychiatric symptoms or falls. Articles were excluded if they only related to patients with dementia.

Following title and abstract review, 1331 articles were excluded.

After full text review, 9 articles remained, which underwent a risk of bias analysis.
Results. Outcomes were heterogenous, so were not suitable for meta-analysis. Therefore, the results are presented in narrative form. The articles included 6 Randomised Controlled Trials (RCTs), 2 open-label trials and 1 case-series.

Three of the studies focused on psychosis. Two of these studies indicated a benefit of rivastigmine on psychotic symptoms in Parkinson's disease. However, these studies were an open label trial and a case series, and the results were not reproduced during RCT.

One RCT indicated benefit of rivastigmine in rapid eye movement behaviour disorder (RBD).

One RCT showed improvements in apathy after treatment with rivastigmine.

Two RCTs demonstrated a reduction in falls with rivastigmine treatment compared to placebo.

One RCT showed a significant improvement on a performance-based measure of cognitive ability.

One study identified brain areas that were hypoactive in hallucinating Parkinson's patients, and the reduced activity could be restored with rivastigmine. This restoration of activity was associated with improved attention compared to baseline.
Conclusion. There is evidence that rivastigmine is beneficial for RBD and apathy in Parkinson's disease, independently from the presence of dementia. There is high level evidence that rivastigmine reduces falls, which may be due to improved attention. The impact of rivastigmine on psychotic symptoms is less clear, but is supported by current theoretical models which involve acetylcholine dysfunction in the generation of visual hallucinations in Parkinson's disease.

Rapid Clozapine Blood Level Determination in a National Health Service Trust

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Aims. The use of clozapine demands regular monitoring of patients' clozapine blood levels. Assays are usually performed in a central laboratory with results available only after several days. The South London and Maudsley NHS Trust wanted to implement a clozapine Point-of-Care (POC) capillary blood test that would provide the benefits of immediate results.
Methods. The MyCare Insite, a small (2.2 kg) tabletop analyser was used. The Insite can readily be connected to electronic health records. Insite device has been fully validated but to achieve the benefit of clozapine POC testing, other factors beyond the test validation needed to be considered. We developed tools, software, and processes to guide health professionals on why and when to measure clozapine blood levels, on what to do with test results, and systems for documentation and tracking of patients' test results. In addition, the device supplier conducted staff training to ensure consistent and correct testing. Finally, users were certified as qualified based on demonstrated proficiency.
Results. We have fully implemented POC capillary clozapine testing across four geographic sites.. Patients and staff preferred capillary finger stick testing over venous draws. Patients' engagement with their results was better than with laboratory testing. Real-time testing for adherence was possible for patients admitted on clozapine. It was also possible to make rapid dose adjustments based on near immediate plasma level results. Patient safety was increased since toxic levels could be quickly detected. Clinical decision-making was expedited as results were available immediately (< 7 minutes). The utility of the testing meant that the length of hospital stays was reduced as discharges were not delayed pending a laboratory result.
Conclusion. Clozapine POC blood level testing was successfully implemented at our institution achieving the expected benefits of clozapine POC testing with near immediate results. The new process improves clozapine management, patient engagement and reduces inpatient bed stays.

Multimorbidity and Polypharmacy in Psychosis: Identifying Potentially Significant Drug Interactions in an Old Age Inpatient Psychiatry Setting