

Discovery Award - Dr Danielle Newby, Oxford

The role of metabolic and cardiovascular disease and treatments in cognitive decline



Dementias
Platform^{UK}
Medical Research Council

Objective(s):

This project aimed to investigate the role of metabolic and cardiovascular disease in cognitive decline. Using DPUK cohort data available on the Data Portal the specific objectives were:

- 1) Production of descriptive and summary statistics for DPUK cohorts following data cleansing and quality control
- 2) To perform statistical analysis of the association between cardiovascular/metabolic **disease** and cognitive decline
- 3) To perform statistical analysis of the association between cardiovascular/metabolic **treatments** and cognitive decline
- 4) To ensure published results were available in open access journals

Overview Summary:

This project arose from a DPUK Discovery Award to Dr Danielle Newby, Oxford to study the role of metabolic and cardiovascular disease and treatments in cognitive decline. By utilising large observational datasets in DPUK, this project will increase our understanding of metabolic and cardiovascular disease and its risk factors in relation to cognitive decline and dementia. The focus was the association of specific blood pressure (BP) lowering medications and cognitive decline over time using multiple cohorts. The results indicated that individuals taking any type of blood pressure lowering medication had slower cognitive decline thereby providing an evidence base for further studies of the management of cardiovascular health as a preventative strategy for slowing cognitive decline.

The Discovery Award provided an invaluable opportunity for Dr Newby to manage her own grant as part of her career development.

Executive Summary:

Cardiovascular disease affects multiple organs beyond those of the cardiovascular system including the brain. We investigated the association of specific blood pressure (BP) lowering medications and cognitive decline over time using multiple cohorts. From the two cohorts analysed, the results indicate that those people taking any type of blood pressure lowering medication have slower cognitive decline. This work provides an evidence base for further exploration into the management of cardiovascular health as a preventative strategy for maintaining brain health and slowing cognitive decline. In turn, this could inform health policy strategies for reducing dementia risk earlier in life.

Summary of Outputs: (as per Researchfish categories)

Publications:

Delays were encountered during the project with data availability meaning that it was not possible to publish in the period of support. Manuscripts are currently in preparation.

Collaborations & Partnerships

- A new collaboration was initiated between Dr Newby and Dr Sana Suri and Prof Klaus Ebimier from the Department of Psychiatry, Oxford working on brain volumes and bp lowering medications using the UKBiobank dataset based on the initial findings of the award.
- Maintaining collaborative links with Professor Lenore Launer from the NIA, USA who is also a collaborator on DN's recent fellowship application to the Alzheimer's Society.

Further Funding

This work is being used as pilot data for fellowship applications. Dr Newby has submitted a Fellowship application to the Alzheimer's Society and will shortly submit further Fellowships to ARUK and MRC.

Next Destinations

Dr Newby is currently submitting Fellowship applications as described above.

Engagement Activities

- A public talk at the "More than a pub" Programme held in the local community.

<p>Preliminary results from this award were presented at this talk on 23rd September 2019.</p> <ul style="list-style-type: none"> Presented the results from the analysis of ELSA at an internal departmental research meeting on the 23rd October 2019. Gave a talk “How to keep your brain healthy” at a tea club for people with mild memory problems. The talk was based on the background for this project. Set up a focus group based on the results from this project. It will advise on Fellowship applications.
<p>Influence of policy, practice, patients & the public</p> <p>These initial results suggest that individuals taking any type of blood pressure lowering medication have slower cognitive decline. This finding could potentially have important ramifications for health policy strategies for reducing dementia risk.</p>
<p>Research Tools & Methods</p> <p>None</p>
<p>Research Databases & Models</p> <p>None</p>
<p>Intellectual property & licencing</p> <p>None</p>
<p>Medical products, interventions & clinical trials</p> <p>None</p>
<p>Artistic & creative products</p> <p>None</p>
<p>Software & technical products</p> <p>None</p>
<p>Spin outs</p> <p>None</p>
<p>Awards & recognition</p> <ul style="list-style-type: none"> Thames Valley ARUK Travel Scholarship to present this projects results at AAIC July 2020 Best poster prize at the Department of Psychiatry away day- based on this research
<p>Other outputs & knowledge/future steps</p> <p>The award was used to increase Dr Newby’s research training and experience. This was achieved by attendance at the following courses and workshops.</p>

- Advanced epidemiological analysis (LSHTM)
- Longitudinal data analysis (UCL)
- Advanced multiple imputation (Bristol)
- Casual inference school (Leeds LDA)
- Pharmaco epidemiology (LSHTM)

Use of facilities & resources

This project relied on the availability of data in the DPUK Data Portal.

Most successful outcome and what it means for future dementia research:

The results indicate that individuals taking any type of blood pressure lowering medication have slower cognitive decline. This work provides an evidence base for further exploration into the management of cardiovascular health as a preventative strategy for maintaining brain health and slowing cognitive decline. In turn, this could inform health policy strategies for reducing dementia risk earlier in life.

Lessons learned:

- The planned analysis went well once the data was released and available.
- Interactions with DPUK personnel offering support and technical help were really good and helped speed up the process to facilitate cohort data access.
- The analysis plans were delayed by the datasets not being available or having missing information. In future it would be advisable to contact data custodians via DPUK to ensure that the datasets are suitable for the proposed analyses.
- Due to the delays in data availability, the results of this project were not published in open access journals in the time left on the project

Other:

Nothing further to report

Date of Report:

7 April 2020