



Centre for Healthy Brain Ageing (CHeBA) Sydney Memory and Ageing Study

NEWSLETTER | December 2020

Fifteen years later...

When we wrote our grant proposal over 15 years ago, we hoped to shed light on brain ageing and help find ways to avoid dementia in late life. This hope has been partially fulfilled. What we did not imagine was that we would still be working with such a wonderful group of people in 2020 or that it would be such a fruitful collaboration.

The population we selected for study comprised people aged 70-90 years old living in the local area. We obtained your names from the Electoral Roll and approached you to help us with the study. Almost 2000 people accepted and after applying certain eligibility considerations, 1037 of you kindly agreed to join our study. Neither we as researchers nor you as participants knew that we would be able to continue this exploration of the human mind for a decade and a half! Fortunately, our initial five year grant was renewed twice, which enabled the study to reach this milestone.

Sadly, nothing lasts forever. Our numbers of participants have gradually dwindled to just under 300 as about a third have died and a third have decided not to continue. Our funds are expended and there is no possibility of further grants to support continued follow-up. And, finally, I suspect many of you are rather tired of our assessments and questions.

You have been very patient, very generous with your time and extraordinarily helpful. Thank you! In this newsletter you will read about the achievements of the Sydney Memory and Ageing Study which has become famous in scientific circles for our discoveries and publications, supported the training of many young researchers and been instrumental in promoting international collaborations and indeed a very large trial to help prevent dementia.



Professor Permindar Sachdev & Professor Henry Brodaty, Memory & Ageing Study Project Leaders

Research is the key to the health gains the world has made over the centuries. Research has seen deaths from heart disease steadily decrease over the last 50 years. Research has seen life span increase by over 25 years in the last century. Our vision at CHeBA is that research will enable us to live longer and better lives. CHeBA's vision is a full life-span free of cognitive decline, free of dementia.

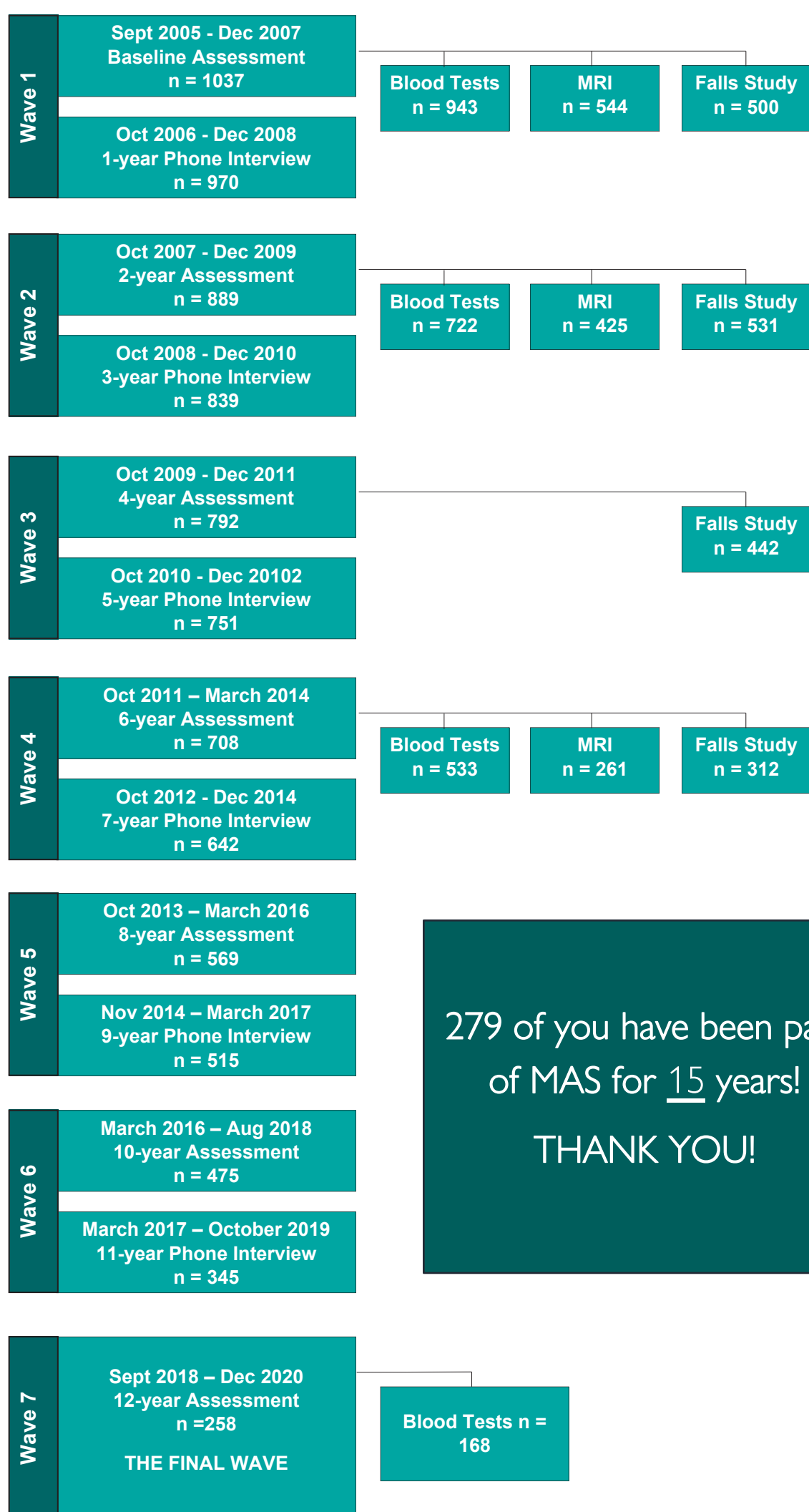
We would like to thank our magnificent team over the years - our successive trial coordinators Melissa Slavin, Simone Reppermund and Katya Numbers, a legion of research psychologists who met you and performed the assessments, our data managers and statisticians, and our behind the scenes team managing the administration, finances and communication, especially Angie Russell and Heidi Douglass. We also acknowledge the NHMRC and several other funding organisations for their continuous support of the study.

Finally, we thank you for your contribution to this vision and wish you all the best for the future. Season's greetings and a safe and restrictions-free 2021 to you all.

**Scientia Professor
Permindar Sachdev AM**

**Scientia Professor
Henry Brodaty AO**

Sydney Memory and Ageing Study - Progress to Date



279 of you have been part of MAS for 15 years!
THANK YOU!

What You Have Done

Katya Numbers

The Memory and Ageing Study (MAS) began in 2005. *Fifteen* years later, you are now a part of the longest continuous running study of cognitive ageing in Australia. That is no small feat.

As a participant in MAS, you have spent close to 32 hours over those years completing cognitive and medical assessments and questionnaires with us. That is almost an entire working week that you have donated to our research! Further, if you participated in optional MAS components, such as MRIs or blood donation, you could add another 10 - 15 hours on top of that. You have also taken the time to fill out a whopping 220 pages of questionnaires as a MAS participant or 180 as a MAS informant. We appreciate your generosity.

The Memory and Ageing Study is world renowned and its data (always made anonymous and with appropriate Ethics Committee approval) are sought by leading researchers globally. Behind the MAS data – behind all of those numbers – are you: the study participants and their knowledgeable support people. We know your names, your faces, your stories, and your journeys throughout MAS. We also know how demanding our research is and how much time and effort you have donated over the last decade and a half to our study. We know how lucky we are to have met you and to have included you in our study and we hope you know how much we appreciate you.



We would like to inform you about some key findings. Check out our article “What We Have Done” on the next page to read about how your data have been put to use. Examples include determining what are risks for people with memory complaints developing dementia, does socialisation help prevent cognitive decline, what diet is associated with better cognition and less dementia, how to improve MRI brain imaging, what is link between diabetes and cognitive decline, and more...

Because of your contributions to our study, and the data that we have collected from your assessments and questionnaires, dozens of young researchers have received their Honours, Master's, and PhD degrees. Many more Postdoctoral Fellows have gone on to write important papers and receive prestigious grants with your data, and are now, years later, themselves professors teaching the next generation of rising academic stars. Large scale international collaborations (called Consortia) have been formed around your data, bringing together leading experts from across the world who are working together to better understand, and hopefully one day prevent, neurocognitive disorders like dementia. In short, your generosity has led to countless important accomplishments and outcomes and will continue to do so for many years to come.

Learning about barriers and motivations to participate in research can help us to improve our study designs and recruitment methods, especially for more demanding or time-consuming studies like MAS. In fact, there is a whole field of research exploring why older adults participate in research^{1,2}. A participant quote from one such study¹ reads: *“It's nice to help other people, if I can, if the results are going to help other people, that's fine. You know I've been helping people all my life, one way and another.”* Many of you have echoed similar sentiments to us in interviews and calls over the years and participate in our study as a way of giving back to others.

Research has found that increased participation in intellectual and social tasks is associated with slower cognitive decline and may reduce risk of dementia³. It has been hypothesized that engagement in intellectually demanding tasks across a lifetime can result in functionally more efficient cognitive networks and, therefore, provide a *cognitive reserve* that delays the onset of symptoms of dementia. Experiences that are cognitively demanding may promote cognition in a way that is analogous to physical exercise building and maintaining our muscles and our heart⁴. It is our hope that you have gained something from your participation too!

¹Baczynska, A. M., Shaw, S. C., Patel, H. P., Sayer, A. A., & Roberts, H. C. (2017). Learning from older peoples' reasons for participating in demanding, intensive epidemiological studies: a qualitative study. *BMC medical research methodology*, 17(1), 167.

²Dahlin-Ivanoff, S., Sterner, T.R., Blennow, K. et al. Was it worth it? Older adults' experiences of participating in a population-based cohort study – a focus group study. *BMC Geriatr* 19, 224 (2019). <https://doi.org/10.1186/s12877-019-1238-4>

³M Tucker, A., & Stern, Y. (2011). Cognitive reserve in aging. *Current Alzheimer Research*, 8(4), 354-360.

⁴Scarmeas, N., & Stern, Y. (2003). Cognitive reserve and lifestyle. *Journal of clinical and experimental neuropsychology*, 25(5), 625–633. <https://doi.org/10.1076/jcen.25.5.625.14576>

What We Have Done

Katya Numbers

Now that you know how many hours you have contributed to the Memory and Ageing Study (MAS), you are probably wondering what exactly has been done with your data. The answer is, quite a lot.

Research projects using *your data* have resulted in an impressive number of published studies with important real-world outcomes for older adults worldwide. For example, we now know that physical exercise, cardiovascular (heart) health, social network size, a well-balanced diet, and complex mental activities are all associated with healthier brain ageing and a reduced risk of dementia. And although these relationships might not come as much of a surprise, we have also uncovered novel associations between healthier brain ageing and things like hearing, smelling, oral health and gut microbiome. But this is only the tip of the iceberg. Countless other factors associated with better physical and cognitive ageing have been found using *your data*. So, how does this happen?

First, the data that you (our participants and informants) have contributed to MAS is captured and housed in our data repository. Researchers and students who wish to access your data first submit a formal request and, if successful, receive the raw numbers that we have extracted from your interviews and questionnaires. This is done in a way that cannot identify individuals and data always remain anonymous. Since the study's inception in 2005, approximately 215 groups of researchers and students have applied to use your data for their projects.

From these initial data requests, an impressive 178 MAS publications have been written and accepted into leading national and international scientific journals, with another 37 currently underway. Dozens of Honours and 4th year Medical students have used your data to complete their research projects, and over 50 PhD students have used, or are currently using, your data for their theses project. Once postgraduates, these students will go on to teach and mentor the next generation of cognitive scientists, who may one day examine your data for their projects as well.

In addition to papers, your data have been presented by our researchers at hundreds of national and international conferences about cognitive ageing and dementia. These conferences allow us to showcase the important findings that have come out of MAS to many acclaimed researchers from around the world. This has led to many exciting international collaborations, called consortia, where we combine your data with data from other large ongoing studies of cognitive ageing.



Consortia collaborations help us to better understand similarities and differences in risk factors for dementia and cognitive decline across countries and cultures.

But beyond papers, presentations, and successful students, your data have contributed to many important *outcomes* in the field of cognitive ageing. Because we have been able to follow-up with you for so many years, and because you have completed so many interviews and questionnaires for us, MAS has an incredibly rich dataset. This allows us to examine a huge array of variables and how they relate to healthy and impaired cognitive ageing over time. We've outline just a few of these important findings above in this article and have included some 2020 highlights throughout this newsletter.

We are often asked by participants and their families if “anything has ever come from this data?”. As you can see, the answer is a resounding “yes!”. Because of your data, we – and other researchers around the world – have a better understanding of factors that are related to the increased risk of dementia as well as healthier brains in later life. The good news is that many of these factors are modifiable (e.g., diet, exercise, stress) and can be changed across a lifetime.

We hope you realise the scale of what has come from your generous contributions of time and effort to MAS over the last 15 years and how your data has, and will continue to, generate important findings for many years to come.

For more information on how your data will be used moving forward, check out our article “What We Will Do” on the next page. And for more information on MAS research and publications, check out these websites: <https://cheba.unsw.edu.au/publications> ; <https://cheba.unsw.edu.au/blog>.

What We Will Do

Virginia Winter

Now that you know a bit more about what has come out of the data you have contributed to the Memory and Ageing Study (MAS), you are probably wondering what happens next. Once the study is over, does the research stop? Definitely not.

As you now know, MAS is now the largest and longest continuous study on cognitive ageing in Australia. In the previous section we described how your interview and questionnaire data have contributed to an enormously rich dataset that is highly sought after by national and international researchers. Although we will no longer be conducting new assessments, we assure you your data will continue to be used in new research projects for many years to come. These projects include important research papers and presentations led by top scholars, new international collaborations between cognitive ageing studies, and innovative thesis topics for future PhD students.

We met with you in person every two years; we refer to each visit as a 'Wave'. You have now completed 7 Waves! We have previously made available the data from Wave 1 (2005 – 2007) through to Wave 5 (2015 – 2017), which has been used by hundreds of researchers and students.

Just recently, we have made available the data from your Wave 6 assessments, which were conducted with you between 2017 – 2019, with several new projects using these data already underway. In the coming months, we will be preparing the data from your most recent Wave 7 assessments (2018 – 2020). These data will be extremely exciting to the many researchers who are keen to analyse the results of the extensive assessments you have participated in over the last 15 years since the study began.

As discussed, MAS also contributes data to several large international consortia. Many research groups from around the world have established their own local or national studies like MAS to investigate similar questions on the effects of ageing on cognition. By combining these studies

into consortia, researchers have access to larger sample sizes that are often necessary to detect important, but sometimes small, effects. Consortia also allow us to examine similarities and differences between your data and data from older adults from different geographical areas and ethnic groups. These consortia are helping to provide a more global picture of risk and protective factors associated with cognitive health.

Every one of these research projects helps to increase our understanding of the effects of ageing on cognition over time and of the predictive and protective factors for cognitive decline and dementia. In turn, these findings help to inform public health policy by promoting evidence-based lifestyle and behavioural changes that may reduce our risk of cognitive decline and have helped to develop new tools for the assessment and early diagnosis of dementia, as well as guide future work on the development of possible treatments. It is your dedication – your time and generosity – to the study that has made this possible.

If you would like to continue your involvement as a volunteer in research on healthy brain ageing, you may wish to consider checking out and signing up for the following:

- **Step Up for Dementia Research** – a service connecting individuals (both with and without dementia) with researchers conducting studies into dementia prevention, diagnosis, treatment, care and cure.
www.stepupfordementiaresearch.org.au/
- **Australia Dementia Network (ADNeT)** – a network of leading scientists and researchers from across 15 institutions, working together with the aim of establishing the first dementia clinical quality registry to track, benchmark, and report on the clinical care of people with dementia.
www.australiandementianetwork.org.au/



Meet Our Researchers

Dr Katya Numbers

Did you experience a 'defining moment' which led you to this field?

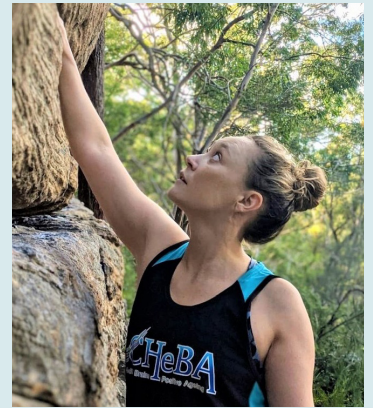
In 2015 I met a study participant who was particularly anxious about her memory and who performed quite poorly on our tests. She was also the president of the Victorian Lyrebird Society and one day she took us on a tour of her property. During that walk it was evident that her recall of the specific birds was excellent. Her anxiety was alleviated when in her own environment, and her memory far greater. This inspired me to investigate whether participants' feelings were interacting with their memory.

What is the ultimate hope you have for your research?

That we move towards more positive perceptions of ageing. I want to use research to change the narrative of ageing for myself, for my mother, for our participants, for my colleagues, for their children and so on.

Do you have any personal interests which protect against cognitive decline?

I exercise a lot and try to maintain a healthy Mediterranean style diet. I love playing board games and doing crossword puzzles. I also want to keep practicing French and learn to play my mandolin.



Dr Numbers is a passionate rock climber

Dr Adam Bentvelzen

How did you get into researching the ageing brain?

After my Bachelor of Psychology I realised my core interest was the clinical side of neuropsychology, so I studied a combined PhD/Master degree in Clinical Neuropsychology. I felt that research into the ageing brain was a perfect fit for my aptitudes and interests and here I am today!

Do you have any personal interests which protect against cognitive decline?

I cycle approximately 35 kms each week and enjoy taking long walks. I always try to do a couple of projects at the same time and regularly read the latest articles on brain and ageing-related research, as well as fiction. While our new baby was up during the night I managed to read three novels from *The Stormlight Archive* by Brandon Sanderson. I am mostly vegetarian and try to eat minimal meat and I also enjoy cooking.

What is the ultimate hope you have for your research?

I hope that telephone cognitive assessments become more common practice. We need to be able to reach people as soon as possible to identify whether something is wrong. Only then can we potentially intervene to help them. Ultimately, I hope that we can use all the tools at our disposal to defeat dementia.



Dr Bentvelzen and Louie, one of his three cats

Virginia Winter

How did you get into researching the ageing brain?

While completing my clinical training in neuropsychology, I began work as a Research Assistant within the UNSW School of Psychiatry, which set me off on a career in research. After graduating, I moved several times between Sydney and London, following a passion for travel and being open to interesting research opportunities that presented themselves along the way. It was not until I worked on clinical trials for dementia that I realised this was a field I wanted to pursue.

Do you have any personal interests or activities which are protective behaviours against cognitive decline?

I try to combine running with some pilates as I realise how important it is to maintain my strength as I get older. I also eat a healthy and mostly plant-based diet; I don't drink much and I stay socially connected with my friends and family. We recently have adopted a 5-year-old whippet. She has inspired our family to get outside and exercise more together – although none of us have got close to out-running her!



Virginia (right) and her sister-in-law Jane after completing the Gold Coast half Marathon

Paper Highlights

Social Interaction Linked to Better Cognitive Performance

How people interact with and perceive one another, and each person's thoughts and feelings about the quality of those interactions and relationships, can affect physical and mental health and well-being. In an article published just this month in *The Journal of Gerontology: Series B*, CHeBA researcher, Dr Anne-Nicole Casey, used data from the Memory and Ageing Study to determine whether reciprocal relationships exist between cognitive function and the social network size of older adults. Clarifying the contribution that social networks and other modifiable lifestyle factors make toward maintaining cognitive function will help inform clinical guidelines and interventions that promote healthy brain ageing.

Dr Casey found that a person's age, years of education, scores on a measure of depression and the number of face-to-face contacts that they had with friends and family per month predicted differences in their cognitive function. When compared to people who reported what might be considered an average or above average number of face-to-face contacts (approximately 11 or more per month), the people who reported fewer than five regular face-to-face contacts per month scored lower on cognitive tests. People who did not have any face-to-face contacts showed lower ability to coordinate goal-oriented behaviour and thought processes (what we call Executive function).

These findings suggest that the type, frequency, and number of social relationships older adults have are associated with their cognitive performance. Next, Dr Casey plans to look at the relationships between social network size and type, and frequency of interaction, and future cognitive performance. In this way, she can determine whether maintaining, or growing, your social network size and frequency – and possibly diversifying your interaction types – can help preserve healthy cognitive function and reduce the risk of dementia.



Cross-lagged modeling of cognition and social network size in the Sydney Memory and Ageing Study. Casey, ANS, Liu, Z, Kochan, NA, Sachdev, PS, & Brodaty, H. (2020). *The Journals of Gerontology: Series B*.

Full article not yet available online.

Metformin Treatment Linked to Slowed Cognitive Decline

New research has revealed that individuals with type 2 diabetes who used metformin, the first-line treatment for most cases of type 2 diabetes and one of the most commonly prescribed medications worldwide, experienced slower cognitive decline with lower dementia rates than those who did not use the medication. The findings provide new hope for a means of reducing the risk of dementia in individuals with type 2 diabetes, and potentially those without diabetes.



"We've revealed the promising new potential for a safe and widely used medication, which could be life-changing for patients at risk of dementia and their families. For those with type 2 diabetes, metformin may add something extra to standard glucose lowering in diabetes care: a benefit for cognitive health," says first author Professor Katherine Samaras, Leader of the Healthy Ageing Research Theme at the Garvan Institute and endocrinologist at St Vincent's Hospital Sydney.

As they age, people living with type 2 diabetes have a staggering 60% risk of developing dementia.

The researchers of this study investigated data from 123 participants of the Sydney Memory and Ageing Study with type 2 diabetes. Sixty-seven of those participants received metformin to lower blood sugar levels. The researchers compared cognitive function of those who were taking metformin to those who were not.

The findings revealed individuals with type 2 diabetes taking metformin had significantly slower cognitive decline and lower dementia risk compared to those not taking metformin. Remarkably, in those with type 2 diabetes taking metformin, there was no difference in the rate of decline in cognitive function over 6 years compared to those without diabetes.

Metformin-use is associated with slowed cognitive decline and reduced incident dementia in older adults with type 2 diabetes mellitus: the Sydney Memory and Ageing Study. Samaras K, Makkar S, Crawford JD, Kochan NA, Wen W, Brian D, Trollor JN, Brodaty H & Sachdev PS.

Diabetes Care, 43(11): 2691-2701.

Published: November 2020

Certain Memory Complaints Predict Future Dementia

Research led by Memory and Ageing Study Coordinator, Dr Katya Numbers, has shown that certain presentations of memory concerns by older adults are predictive of future dementia. This highlights the importance of general practitioners in listening to their older adult patients in relation to memory. "We found that when older adults go to their GP with memory-specific subjective cognitive complaints it would be wise to take it seriously as they may predict future dementia", said Dr Numbers.

Subjective cognitive complaints refer to an individual's self-experience of cognitive decline.

Research increasingly suggests that these subjective complaints may be the earliest detectable stage of preclinical dementia. According to Dr Numbers, subjective cognitive complaints have the potential to capture everyday memory problems that are not always detected by clinical tests. Subjective cognitive complaints can be self-reported or reported by someone close to the individual. They can refer to specific changes in memory ability or changes in other cognitive domains like language or processing speed.

The research investigated information from 873 MAS participants without dementia at their first assessment. Neuropsychological assessments were carried out initially and second yearly for six years, along with questions about subjective cognitive complaints. Assessments were reviewed by a panel of expert clinicians who determined whether a clinical diagnosis of dementia should be made. The study also examined responses from 843 informants to questions about changes in participants' cognitive abilities.

Participant and informant memory-specific cognitive complaints were associated with the rate of global cognitive decline. "If an informant noted that the person had poorer memory, six years later we found a decline in memory and executive function (planning, understanding, abstract thinking)", said Professor Brodaty, leader of the Memory and Ageing Study and Co-Director of CHeBA.

Participant and informant memory-specific cognitive complaints predict future decline and incident dementia: Findings from the Sydney Memory and Ageing Study. Numbers K, Crawford JD, Kochan NA, Draper B, Sachdev PS, Brodaty H. PLoS One. Published: May 2020

Read the full article here:
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0232961>

1 in 10 Appeal



Let's reduce the risk

www.bit.ly/CHeBA1in10Appeal

Stay in Touch

While we have mostly been working from home during the COVID-19 pandemic, you can still reach us using the study contact details below.

Write to us at:

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