

VASCOG 2016: A view from the students

You may have seen us, walking around in our VAS-COG T-shirts, handing out badges or sitting behind the information desk. A group of 15 students, mainly from medicine and neuroscience, were present at the VAS-COG congress, experiencing such an international event for the first time. In exchange for some assistance at the organization of the congress, we got to attend the masterclasses, presentations and many other aspects of the conference. Here is a small summary of our impression of VAS-COG.

Wednesday – Teaching sessions/pre-conference

VASCOG congress started with the heart-brain masterclass. Bert van Rossum, VUmc Amsterdam, was the first speaker. Cardiology was briefly presented in this lecture, 'Cardiology in a nutshell'. He took us through the different forms of heart failure, causes and predictors. The second speaker was Jaap Kapelle, from UMC Utrecht. The subject of his lecture was large vessel pathology and brain dysfunction. He spoke about the causes of large vessel pathology, but also the defence mechanisms from the brain. Next to this he briefly described the treatment options and numbers needed to treat. I think this was a great follow-up of the first presentation. The last presenter of this session was Sudha Seshadri, from Boston University. This lecture focussed on cerebral small vessel disease. The disease mechanism, risk factors and impact were discussed during this lecture.

After the coffee break Vincent Mok started his lecture, with great enthusiasm, by giving the audience a panoramic view of the Hong Kong skyline. With this view, he introduced the subject of his talk: a panorama view of stroke related dementia and small vessel disease. Prof. Mok's fascination for post-stroke dementia started several years ago. Studies showed that the chance of developing dementia after having had a stroke nowadays is 9 times lower compared to 30 years ago. Because of improvements in preventative medicine and cardiovascular risk management less people experience a stroke and those who do suffer from a stroke, experience less severe consequences. Mok ended his talk with a number of research questions about Small Vessel Disease.

Next up, using several pictures of vascular damage on a macroscopic and microscopic level, Julie Schneider gave an overview of pathological lesions of cerebral vascular disease. She told about two forms of vascular damage, arteriosclerosis and vascular damage caused by cerebral amyloid angiopathy. This amyloid protein is linked to Alzheimer's disease (AD) amyloid, but it is not necessarily found in patients with AD. Schneider also showed us why pure AD is uncommon. With this in mind, proper cardiovascular risk management could reduce the chance of developing AD as well as cause a less rapid decline in patients diagnosed with AD.

After lunch the conference is split in two. The attendees could choose whether to go to 'Neuroimaging of cerebrovascular disease', where Meike Vernooij, whose presentation was very interactive and the whole audience participated in the quiz, Alexander Leemans and Jeroen Hendrikse enlightened us with a lot of information about forms of imaging the brain, or to go to 'Diagnosis and treatment in patients with symptomatic cerebral SVD', where Andrew Lawrence talked about the difficulty of diagnosing early cognitive impairments in SVD and the impact of the cognitive impairment on the patient. He mainly talked about the domains of dysfunction which are caused by SVD and the specific tests you can use. Edo Richard's talk was about depression and apathy in SVD. He stated that SVD is related to depression and apathy, but the causality of this relationship is difficult. Rianne Esselink talked about several kinds of treatment and ended her lecture by

showing two cases from clinical experience with different kinds of Parkinson. In this way she gave a lecture which was very interesting and very good to follow and understand.

The first day ends with some complicated matter about animal models in cerebral SVD (Donna Wilcock and Louise van der Weerd) and why we should bother about cerebral blood flow and oxygen consumption, by Martin Lauritzen.

A quite impressive and exhausting first day was closed at the welcome reception at the Stedelijk Museum, a very modern day building in the beautiful and authentic centre of Amsterdam.

Thursday – Main conference

During the opening of the main conference, the students were more than busy at the registration desk. The number of people to attend the VAS-COG congress was quite impressive.

‘Diabetes and the brain’ started with Rachel Witmer: Relate diabetes to cognitive impairment and dementia. Diabetes is a major public health burden. Even a modest effect of diabetes on cognitive function has significant public health implications. Population-based studies have shown that those with type 2 diabetes mellitus have an increased risk of dementia, and neurodegeneration and that there are many mechanisms through which diabetes could increase the risk of dementia.

Then Zoe Arvanitakis continued about using postmortem brain tissue to elucidate mechanisms linking diabetes with dementia and Caterina Rosano talked about midlife type 1 diabetes and neuroimaging biomarkers of brain aging.

After the coffee break Philip Scheltens and Miia Kivipelto told us more about clinical trials in vascular cognitive and behavioral disorders. Philip Scheltens started the session with a lecture about the do’s and don’ts in clinical trials in dementia. He introduced his presentation in an interesting way. He referred to the book ‘50 shades of gray’. It became clear he only referred to the book because of the title. In his lecture he discussed a few of the 50 way to improve research on Alzheimer Disease. The following speaker was Miia Kivipelto with a lecture about advances in the prevention of vascular cognitive impairment. During this lecture she discussed three ways of prevention. The main message was: ‘what is good for the heart is good for the brain.’

After the two lectures there were four selected orals. Unfortunately these speakers only had seven minutes to present their abstracts and because of this time limit it felt like you hadn’t heard everything. The selected orals were: ‘Drug Development for Patient With Vascular Cognitive Impairment: Systemic review’ by Eric Smith. ‘Statin Treatment, Cognitive Function and Risk of Cardio Vascular events: Secondary Analysis of the PROSPER trial’ by Behnam Sabayan. ‘Prevention of Dementia by Intensive Vascular Care (preDIVA) – a 6 year cluster- randomised controlled’ by Edo Richard. And last but not least: ‘Effect of discontinuation of antihypertensive treatment in elderly people on neurocognitive function’ by Justine Moonen.

Then the poster presentations started. The variation between the posters was wide. It went from ‘A monkey model of Alzheimers disease induced by streptozotocin’ (Hyeon-Gu Yeo) to ‘Correlation of white matter hyperintensities in cognitively healthy elderly monozygotic twin pairs (Mara ten Kate) and ‘Acute cerebral microinfarcts on diffusion-weighted imaging in patients with vascular cognitive impairment (Hilde van den Brink).

The ‘Heart-Brain connection’ session started with the Dutch Heart Foundation Lecture by Constantino Ladecola. He stated about vascular factors in dementia and that it’s more than meets the eye. Followed by Angela Jefferson about heart function as a risk factor for dementia and AD. “Heart function could prove to be a major risk factor for dementia and Alzheimer’s disease,” said Angela Jefferson. A very encouraging aspect of her findings is that heart health is a modifiable risk. You may not be able to change your genetics or family

history, but you can engage in a heart healthy lifestyle through diet and exercise at any point in your lifetime. At present, there is no proven method for preventing dementia or Alzheimer's disease. But leading a heart healthy lifestyle could help. When 30 percent of the population is exposed to a potential risk factor, like low cardiac index, that suggests it may be of significant public health concern."

Friday – Main conference

Friday's lectures began at 9.00 am with Nutrition and the brain: from bench to bedside. Ondine van de Rest was the first speaker of this session. In this lecture she presented all of the new perspectives on nutrition and dementia. For example the effect of higher fish intake (omega-3) on cognitive impairment. Vitamine B12 and complete diets like the MIND diet were also discussed. Tobias Hartman was the second speaker with the subject of lipiDiDiet study results on multi nutrients. Dr. Hartman gave a great overview of the different micronutrients and the effect they have on cognitive decline and diseases. Thanks to his enthusiasm and passion for research, this was a very informative lecture. The morning session ended with four selected abstracts. The subjects of these abstracts were:

- Malnutrition and the onset of cognitive impairment/dementia
- The effect of high fat diet 40% compared to low fat diet 3% on the cognition of mice
- Vitamine B12 and cognition
- The effect of a Mediterranean diet on a mid-aged Dutch population

At the session 'Molecular/cellular targets in vascular cognitive and behavioral disorders', Julie Schneider talked about conceptual shifts in cerebral blood flow regulation. There is a lack of consensus of the definition of hippocampal sclerosis, especially in the differentiation between whether its origin is neurodegenerative or vascular. TDP-43 is the new kid on the block related to aging. Martin Lauritzen with CDF regulation stated that the brain energy usage does not increase so much when the activity goes up; it is not comparable to muscles.

Next up there was another round of poster presentations, just like the day before. This was followed by the debate with the following question: 'Which research discipline is the best, especially concerning the topic vascular influences in cognitive decline and dementia?' The four disciplines were led by: Donna Wilcock (basic science), Ingmar Skoog (epidemiology), Charles DeCarli (neuroimaging) and Raj Kalaria (pathology). The tension between the different disciplines increased during the different speeches. It was apparent that every speaker tried to undermine the other disciplines, but telling very little about their own discipline. Raj Kalaria filled his speech with a wonderful song about pathology. Unfortunately this did not convince the audience to vote for his discipline, while most of the votes were divided over the other three disciplines.

Late in the afternoon, during 'Emerging biomarkers in vascular cognitive and behavioral disorders', Patrick Kehoe talked about the Renin Angiotensin System and the Brain. Marcel Verbeek told us about novel fluid biomarkers in cognitive impairment and dementia.

The friday ended in the Rode Hoed, where the party lasted until after midnight.

Saturday – Main conference

On the last day of the conference, which was significant calmer than the days before, Serge Rombouts kicked off in the session 'The connectome in vascular cognitive and behavioral disorders'. He talks about functional markers for cognitive disorders. Researchers hope to predict future cognitive decline with network integrity measures. The functional networks may help predict decline, but also provide a tool for an early diagnosis. Functional connections can be shown with eigenvector centrality. All functional connections in the brain decrease with age. Young carriers of the APOE4 allele have distinct patterns of brain activity. This may be used

to predict the disease in an early stage, even without knowing they are carriers. To do so they use machine learning: combining scanning and analysis methods for individual classification. Combining multiple anatomical MRI measures improves Alzheimer's disease classification. It is still needed to figure out what combination of measures is needed for the best prediction. Yaell Reijmer tells us that sometimes MRI markers do not show correspondence to the cognitive impairment, because a lot is going on in the brain at the same time.

The VAS-COG congress ends with a session dedicated to 'Emerging findings from longitudinal studies', where Sudha Seshadri, Leonardo Pantoni, Afran Ikram and Frank-Erik de Leeuw close the conference with their views on vascular factors, the risk of functional decline and neuroimaging from their respective, impressive longitudinal studies.

After these four days we can say that the VASCOG congress was a big success. For us, the students, it was the first time we had the opportunity to see such inspirational lectures and we were absolutely blown away. We got some great feedback from the attendees and after four days we even recognized many of them. We hope everybody enjoyed it as much as we did and maybe we see you next time!

Amsterdam, October 2016: Nienke Grun, Sarah Mikdad, Shan Sui Nio, Ruveyda Şahin, Tubâ Aras, Philip Dijkhorst, Rosa Humpig, Johan Tol, Noucka van der Zaag, Maaïke van Schagen, Leonie Franken, Emma Kleipool, Nick Weaver, Naomi Vlegels, Hilde van den Brink, Liora Rodill, Nancy van der Mark, under supervision of Wiesje van der Flier