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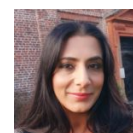
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Personalised medicine: a transformative era in dementia research



Posted by
Nagina Khan

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Alzheimer's disease is the most common form of dementia in ageing societies. As populations age, it is expected that this number will quadruple by the year 2050, placing a considerable burden on public health systems (Sloane et al, 2002). Currently available drugs only slightly affect disease severity and progression, Alzheimer's and other forms of dementia remain at present effectively untreatable (Siemieniuk et al, 2015).

Interventions preventing, halting, or decelerating the progression would reduce the individual suffering of affects and would significantly relieve public health burden (Siemieniuk et al, 2015).

However, in recent years the advancements in research, diagnosis, treatment of Alzheimer's and other dementias has heralded a phase of personalised medicine, which is also a part of precision medicine (Tooke et al, 2015). The concept of precision medicine, is an approach for disease prevention and treatment that is personalised to an individual's specific pattern of genetic variability, environment and lifestyle factors (Reitz, 2016) .

The notion of personalised medicine is not new, more than 2,000 years ago Hippocrates suggested that *"it is more important to know what sort of person has a disease, than to know what sort of disease a person has"* (Murugan, 2015). While for some diseases, in particular select cancers and a few monogenetic disorders such as cystic fibrosis, significant advances in precision medicine have been made over the past years, for most other diseases precision medicine is only in its beginning (Reitz, 2016).

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The terms 'stratified', 'personalised' or 'precision' medicine all refer to the grouping of patients based on risk of disease, or response to therapy, using diagnostic tests or techniques (Tooke et al, 2015). In addition to being more effective, a targeted approach can spare patients from debilitating side effects of standard treatments (Esposito, 2018). However, it's important to realise that targeted drugs have side effects, too (Esposito, 2018).

Furthermore, Dr. Eliezer Masliah, director of the Division of Neuroscience at the National Institute on Aging, recommends an approach that is more effective than a one-size-fits-all. He has suggested that: *"We are learning more about genetic and environmental risk factors and we need to start differentiating Alzheimer's patients based on genetics, environmental exposure and clinical history"* (Sabbagh et al, 2018).

The paper by Vik-Mo et al published recently in the British Journal of Psychiatry is a 12 year longitudinal cohort study, which suggests that understanding the natural course of neuropsychiatric symptoms (NPS) in dementia is important for the planning of patient care and for trial design (Vik-Mo et al, 2019).



The concept of precision medicine, is an approach for disease prevention and treatment that is personalised to an individual's specific pattern of genetic variability, environment and lifestyle factors.

Methods

This paper involved selecting a group of patients from general practice, referred to dementia clinics in Norway that were followed up by annual assessment. All patients that referred with suspected mild dementia were then screened (n = 657), 325 patients fulfilled the inclusion criteria and 223 patients consented to the study.

- The inclusion criteria was mild dementia according to the ICD-10, defined as a Mini-Mental State Examination (MMSE) score of at least 20 or a Clinical Dementia Rating (CDR) global score of 1 (WHO, 2011).

- Exclusion criteria were moderate or severe dementia, acute delirium, previous bipolar disorder or psychotic disorder, terminal illness or recently diagnosed major somatic illness, which according to the clinician would have significantly affected cognition, function or participation in the study (Vik-Mo et al, 2019).

This observational research method involved studying the same group of individuals over an extended period of 12 years. The instruments used by the authors were;

- Neuropsychiatric Inventory (NPI), to assess 10 behavioural disturbances occurring in dementia patients: delusions, hallucinations, dysphoria, anxiety, agitation/aggression, euphoria, disinhibition, irritability/lability, apathy, and aberrant motor activity. The instrument is both valid and reliable (Cummings et al, 1994).
- NPI-Nursing Home was used after participants moved to nursing homes (Selbæk et al, 2008).
- Physical, neurological and psychiatric examinations were performed, including a detailed neuropsychological test battery, Montgomery–Asberg Depression Rating scale, 10 routine blood and cerebrospinal fluid analyses and brain magnetic resonance imaging (Montgomery & Asberg, 1979).
- Dopamine transporter single-photon emission computed tomography scans were available for most patients with suspected DLB.
- Caregivers completed The Informant Questionnaire on Cognitive Decline in the Elderly, a questionnaire shown to be a reliable and valid instrument to detect dementia (Jorm & Jacomb, 1989)
- The clinician completed the CDR and the Hachinski Ischemia Scale (Hachinski et al, 1975).

Statistical differences were tested with Mann-Whitney and Student's t-test. Clinical and demographic variables were shown as mean or proportions. The differences in Alzheimer's disease and LBD frequency of symptoms and clinical course were tested with the χ^2 test.

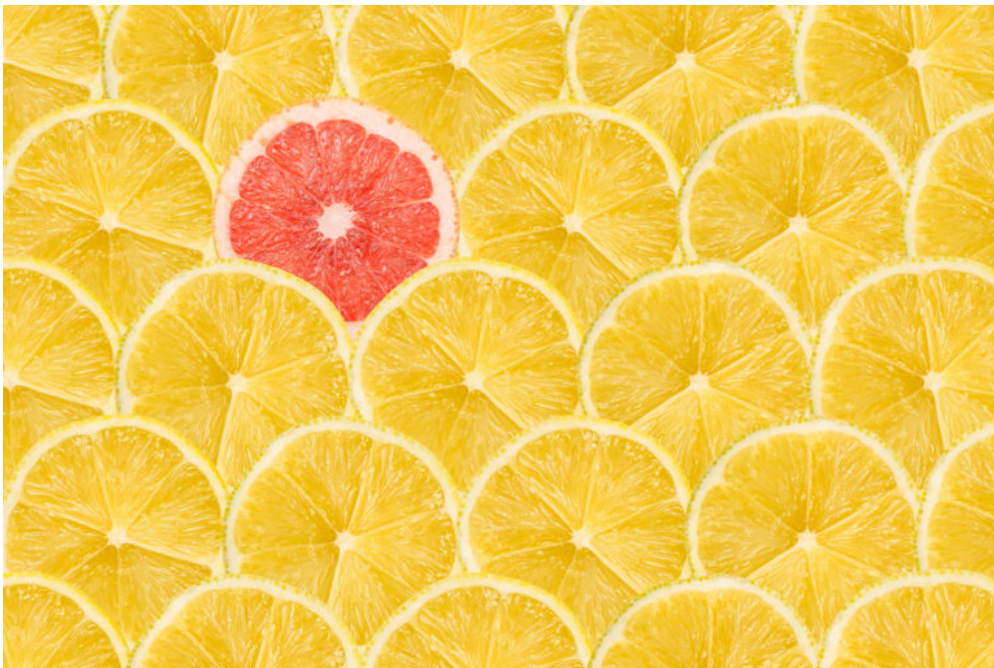
Results

- The cohort consisted of 113 patients with Alzheimer's disease and 84 patients with LBD (including 16 patients with PDD)
- Ten patients were still alive in January 2018, all completed the 12-year follow-up

The authors found that:

- 80% had stable Neuropsychiatric Inventory (NPI) total ≥ 1 ,

- 50% had stable modest NPI total ≥ 12 and
- 25% had stable NPI total ≥ 24 scores.
- Very severe NPS (≥ 48) were mostly single episodes, but 8% of patients with Alzheimer's disease had stable severe NPS.
- Patients with Alzheimer's disease and the highest 20% NPI total scores had a more stable or relapsing course of four key symptoms: aberrant motor behaviour, aggression/agitation, delusions and irritability (odds ratio 55, $P < 0.001$). This was not seen in LBD.
- 57% of patients with Alzheimer's disease and 84% of patients with LBD had reoccurring psychotic symptoms.



This study suggests a highly individual course of neuropsychiatric symptoms in people with Alzheimer's disease, which supports the importance of an individualised approach.

Conclusions

This observational study has successfully provided longer term data on understanding the natural course of neuropsychiatric symptoms (NPS) in dementia, which is not possible in RCTs and few studies have assessed the long-term course of psychotic symptoms.

The authors observed a highly individual course of NPS, most patients presenting as a single episode or relapsing and a stable course was less common, particularly in LBD. These results validate the importance of an individualised approach (i.e. personalised medicine) for the planning of care of patients with dementia.

Strengths and limitations

The study is unique in that it does report a long follow-up time and the very high completeness of data (98%) with an exception for attrition owing to death. Information for the Neuropsychiatric Inventory (NPI) was obtained from family or a caregiver for accuracy; however these informers of NPI changed over follow-up for most patients. An additional limitation is the potential for referral bias and the authors suggest there is little private healthcare for patients and all dementia units, in that region. So to reduce referral bias a letter was sent out before the start of the study to the general practitioners in the area inviting them to refer all patients with suspected dementia. Thus, allowing for representation of a general dementia population.

Maybe an important point to consider by the authors would have been the referral source of clinic-based studies involving dementia with Lewy bodies. Patients with dementia with Lewy bodies recruited from memory disorders programs may have different presenting symptoms and a different course than those referred from movement disorders programs, psychiatry clinics, or from population-based samples. If memory dysfunction is not among the more salient initial problems in dementia with Lewy bodies, those patients referred from memory clinics may be more advanced in the course of the disease (Stavitsky et al, 2006). Also the full clinical description of the excluded and non-consenting patients was not known to the authors or available for future use. The period between assessments of patients was also unknown. Drug and psychosocial management was not standardised, which the authors' state may have influenced the course, however the restrictive use of psychotropics was consistent with the most recent guidelines (Demvest Study).

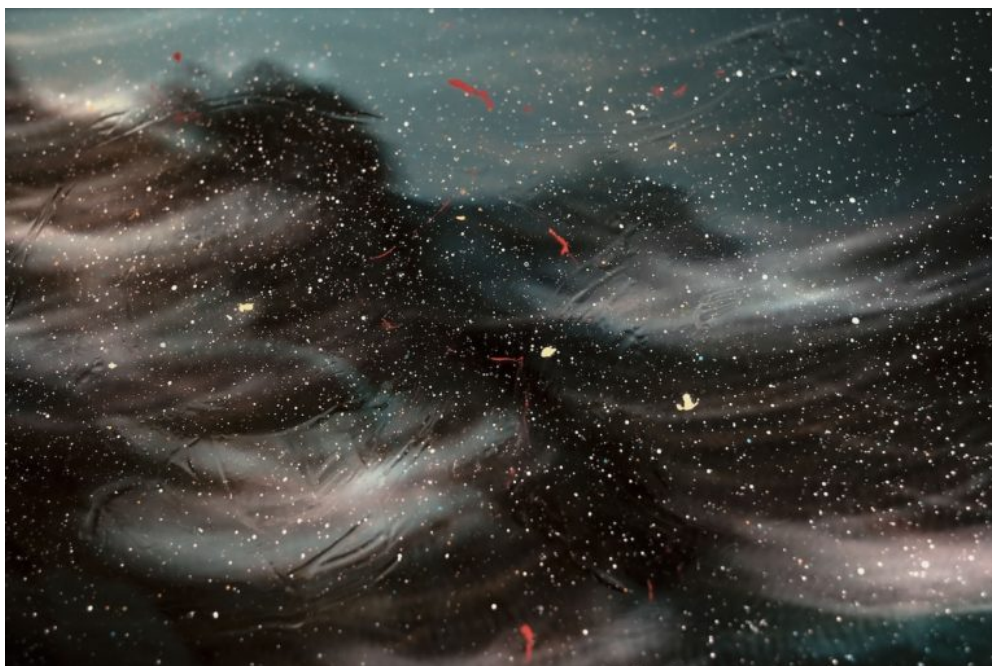
Implications for practice

The important finding from this study for dementia carers, is the highly individual course of NPS that has been identified by the authors, feasibly demonstrating the importance of personalised medicine. Although successful application of precision medicine to dementia will demand extensive additional work to identify risk groups, the underlying pathological processes and develop new interventions, and will continue to require significant involvement of biologists, physicians, technology developers, data scientists, patient groups and others, it is anticipated that this is only the beginning of a broad precision medicine approach targeting the clinical and biological complexity of dementia and building the evidence base needed to guide clinical practice (Reitz, 2016).

A majority of patients also experienced relapsing psychotic symptoms. The authors propose that these findings are important for clinicians because they show that although psychosocial strategies with low risk for adverse effects should always be considered for NPS first, they may also be unnecessary, particularly for more costly interventions of longer duration.

Administration of antipsychotics or other psychotropic drugs with limited effect and low tolerability might not be necessary because NPS often tend to remit spontaneously. These findings are also important for the planning of trials for NPS, showing that spontaneous resolution is common and thus reducing the chances of finding significant drug effects. Although the hypotheses concerning disease mechanisms underlying dementia have

yielded drugs that have been tested in large clinical trials, the results of the trials completed to date have been disappointing and the current treatment strategies for dementia have only minimal effect (Reitz, 2016).



57% of patients with Alzheimer's disease and 84% of patients with Lewy body dementia had reoccurring psychotic symptoms.

Conflicts of interest

None.

Links

Primary paper

Vik-Mo AO, Gill LM, Borda MG, Ballard C, Aarsland D. (2019) The individual course of neuropsychiatric symptoms in people with Alzheimer's and Lewy body dementia: 12-year longitudinal cohort study. *Br J Psychiatry*. 2019 Sep 11;1–6. <https://doi.org/10.1192/bjp.2019.195>

Other references

Sloane PD, Zimmerman S, Suchindran C, Reed P, Wang L, Boustani M, et al. (2002) The Public Health Impact of Alzheimer's Disease, 2000–2050: Potential Implication of Treatment Advances. *Annu Rev Public Health*. 2002 May;23(1):213–31.

Siemieniuk RAC, Guyatt GH. (2015) Corticosteroids in the treatment of community-acquired pneumonia: An evidence summary [Internet]. Vol. 125, *Polskie Archiwum Medycyny*

Wewnetrznej. 2015 [cited 2019 Nov 11]. p. 570–5. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/26020683/>

Tooke J, Lundgren J, Trembath R, Iredale J. (2015) Stratified, personalised or P4 medicine: a new direction for placing the patient at the centre of healthcare and health education [Internet]. The Academy of Medical Sciences. 2015 [cited 2019 Nov 11]. Available from: <https://www.acmedsci.ac.uk/download?f=file&i=32644>

Reitz C. (2016) Toward precision medicine in Alzheimer's disease. *Ann Transl Med.* 2016 Mar 1;4(6).

Murugan R. (2015) Comment: Movement towards personalised medicine in the ICU. *Lancet.* 2015;3(1):10–2.

Esposito L. (2018) What Does Personalized Medicine Really Mean? | Patient Advice | US News [Internet]. US News. 2018 [cited 2019 Nov 11]. Available from: <https://health.usnews.com/health-care/patient-advice/articles/2018-01-26/what-does-personalized-medicine-really-mean>

Sabbagh, Marwan and Leverenz J. (2018) Commentary: Will Personalized Medicine Help Cure Alzheimer's? | Healthcare of Tomorrow | US News [Internet]. [cited 2019 Nov 11]. Available from: <https://www.usnews.com/news/healthcare-of-tomorrow/articles/2018-12-04/commentary-will-personalized-medicine-help-cure-alzheimers>

Vik-Mo AO, Giil LM, Borda MG, Ballard C, Aarsland D. (2019) The individual course of neuropsychiatric symptoms in people with Alzheimer's and Lewy body dementia: 12-year longitudinal cohort study. *Br J Psychiatry.* 2019 Sep 11;1–6.

WHO. (2011) International statistical classification of diseases and related health problems – 10th revision. [Internet]. Vol. 2, World Health Organisation. 2011 [cited 2019 Nov 12]. 1–252 p. Available from: www.who.int

Cummings JL, Mega M, Gray K, Rosenberg-Thompson S, Carusi DA, Gornbein J. (1994) The neuropsychiatric inventory: Comprehensive assessment of psychopathology in dementia. *Neurology.* 1994;44(12):2308–14.

Selbæk G, Kirkevold Ø, Sommer OH, Engedal K. (2008) The reliability and validity of the Norwegian version of the Neuropsychiatric Inventory, Nursing Home Version (NPI-NH). *Int Psychogeriatrics.* 2008 Apr;20(2):375–82.

Montgomery SA, Asberg M. (1979) A new depression scale designed to be sensitive to change. *Br J Psychiatry.* 1979;134(4):382–9.

Jorm AF, Jacomb PA. (1989) The Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE): Socio-demographic correlates, reliability, validity and some norms. *Psychol Med.* 1989;19(4):1015–22.

Hachinski VC, Iliff LD, Zilhka E, Boulay GH, McAllister VL, Marshall J, et al. (1975) Cerebral Blood Flow in Dementia. Arch Neurol. 1975;32(9):632–7.

Stavitsky K, Brickman AM, Scarmeas N, Torgan RL, Tang MX, Albert M, et al. (2006) The progression of cognition, psychiatric symptoms, and functional abilities in dementia with Lewy bodies and Alzheimer disease. Arch Neurol. 2006;63(10):1450–6.

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Nagina Khan

Nagina is a Senior Clinical Research Fellow in Primary Care, Centre for Health Services Studies (CHSS), Division of Law, Society and Social Justice, School of Social Policy, Sociology & Social Research, University of Kent. Nagina's current research supports the Integrated Care Systems (ICS) to capitalise on emerging existing networks in its research duty and mitigate the current risk of future research being conducted in silos and without focus on priorities and underserved populations. This work will diversify the public voice listened to and strengthen ICS strategic links within local research infrastructure to support evidence-based practice, apply solutions, and spread innovation. Nagina was a Senior postdoctoral researcher, in CHiMES, Department of Psychiatry, Oxford University. Nagina's research was focused on social justice, equality, and fairness, in culturally appropriate mental health care and complex interventions. She carried out the staff data analysis of Experience based investigation and Co-design of approaches to Prevent and reduce Mental Health Act Use: (CO-PACT) study. Nagina has worked as a Scientist at Centre for Addiction and Mental Health (CAMH) on the mixed method study focused on the Cultural adaptation of CBT for Canadians of South Asian Origin. During the Covid-19 Pandemic, She has also worked with Touro University Nevada, Las Vegas, on Professionalism in undergraduate medical Education and with the Royal College of Psychiatrists on Social Justice, Differential Attainment and Microaggressions in healthcare and medical education. She was

a Medical Research Council (MRC) Research Training Fellow, her research was centred on complex interventions for people with depression, University of Manchester. Her post-doctoral studies were also undertaken at the NIHR School for Primary Care Research, UK focusing on First episode Psychosis in Young People Using Early Intervention services. Other research interests include Incentivisation Schemes (P4P) in healthcare for HICs and LMICs and Global Health. Nagina is the Associate Editor at BMJ Mental Health, and she is an Editorial Fellow at BMJ Leader.

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