S10: Needs assessment, the basic too for psychogeriatric care
S11: Digital Health and Artificial Intelligence (AI) in Psychogeriatrics: Opening Multiple Frontiers

Symposium Overview

<ins>Session Faculty:</ins>
Ipsit Vahia, MD (Chair): McLean Hospital and Harvard Medical School, Boston, USA
Ana F. Trueba, PhD (Presenter): Harvard Medical School and Universidad San Francisco de Quito, Ecuador
Kreshnik Hoti, PhD (Presenter): University of Pristina, Republic of Kosovo
Bettina Husebø, MD (Presenter): University if Bergen, Norway.

Overall Abstract: The past decade has seen an explosion in the growth of technologies in mental health. Particularly, the scaled adoption of virtual care catalyzed by the COVID-19 pandemic has opened up new frontiers in how digital tools can be incorporated into psychiatry. No area of mental health care is as ripe for digital innovation as psychogeriatrics. In this session, an international group of clinicians and researchers will demonstrate how digital health in psychogeriatrics represents multiple cutting edges of innovation.

Our symposium will include 4 presentations, that represent original research from the USA, Ecuador, Norway, Kosovo and Australia. We will highlight clinical applications of these digital tools and aligned issues such as improved care access in low- and middle-income countries, the ethics of digital data collection and the potential for creating new liabilities.

We will focus on four distinct technologies and applications. Dr. Ipsit Vahia will discuss passive environmental sensing supported by signal processing and artificial intelligence (AI) in guiding treatment decision making, especially in dementia care. His presentation will include discussions on how AI can be incorporated into care while also preserving autonomy. Dr. Kreshnik Hoti will discuss the application of AI on voice-based signals to determine changes in pain levels and psychopathology. His presentation will include research conducted in collaboration between teams based in Australia and Kosovo and through a public-private partnership with a digital health startup. Dr. Ana Trueba will focus on digital interventions, specifically virtual reality (VR). She will present data from two studies, one from McLean hospital In the US, and the other from Ecuador that explore how VR can deliver evidence-based non-pharmacologic interventions. Dr. Bettina Husebø will present data from a project she oversees in Norway. Her talk will discuss how care in nursing homes can be improved by incorporating a range of digital approaches into nursing home care paradigms. A particular focus will be on the relationship between pain and behavior symptoms and dementia among nursing home dwelling older adults.

Thus, the symposium will address diagnostics, treatment and systems level care and how New technologies are shaping the evolution of psychogeriatrics worldwide.

Digital Phenotyping of Behavior and Clinical Decision Making in Psychogeriatrics: Towards Precision Care

Presenter: Ipsit Vahia, MD

Introduction: Appropriate and personalized pharmacologic management of behavioral and psychologic symptoms in dementia (BPSD) is among the most complex clinical challenges in dementia care. Use of antipsychotics and mood stabilizers is common but accompanied by risk, including high likelihood of adverse effects that can lead to hospitalization or institutionalization. Information to support decision-making in these scenarios is typically obtained

from self-report/caregiver report. This presentation will focus on demonstrating how data obtained through digital phenotyping may augment clinical decision making.

Methods: This presentation will include information from 3 completed or ongoing studies. The first looks at radio wave based sensing as a way of passively monitoring behavior and dementia. The second uses wearables to track the impact of psychopharmacologic changes in dementia. The third study focuses on incorporating data from electronic media (e-mail, text messages) impact psychotherapy in early and late life

Results and Discussion: Preliminary results indicate that passive sensing is able to accurately identify patterns of behavior as well as circumscribed clinical events with a precision that exceeds the current standard of care. Data and insights gained from these three ongoing studies are helping develop best practice models that can impact clinical outcomes.

Conclusions: Collectively, the data in this presentation will demonstrate to clinicians a range of approaches towards developing precision care for older adults with dementia and psychiatric diagnosis. These approaches share the common theme of emphasizing the human element in care, while augmenting it with a range of data that provide objective collateral information to guide more precise decision making. The session will also discuss issues that will impact precision care, including the potential for creating inequities, translation to low income settings and countries as well as the matter of data privacy and security.

Seeing people living with dementia through the lens of technology: pain assessment and clinical impact
Presenter: Kreshnik Hoti, PhD

Objective: Due to communication difficulties, pain assessment in people living with dementia (PLWD) is challenging. In this study we explore vocalisations and facial expressions during assessment of pain and provide evidence in regards to clinical impact of pain assessment, as part of a targeted care program.

Methods: In order to determine key facial and vocalisation features and their relationship with pain we analysed a total of 22,194 pain assessments in PLWD (n = 3,144) from 34 different Australian residential aged care homes. Pain assessments were conducted using PainChek, which is a technology-based system comprised of three key components: point-of-care AI-powered application, training and digital analytics. Additionally, we examine the 6-months clinical impact of introducing this system, as part of a wider psychosocial care intervention (i.e., the Reconnect program) in the UK care home setting. Here we focus on how this pain assessment system contributed to the use of psychotropics and issues such as safeguarding.

Results: Likelihood of vocalization feature presence varied based on the intensity of pain. In this regard, sighing and screaming were more likely during experience of higher pain (eight times). During experience of severe pain eyelid tightening was the most frequent facial expression (48.6%) whereas higher pain levels were mostly predicted by horizontal mouth stretch feature. Use of PainChek system as part of the Reconnect program contributed to a more consistent pain management approach, benzodiazepine reduction (29%) and cessation (46%) and reduction of antipsychotic prescribing (22%). Compared to the 6 monthly period from the year prior to implementation of the Reconnect program, a 92% reduction in safeguarding events was reported.

Conclusion: In this study we demonstrate the potential to digitally phenotype key pain behaviours such as vocalizations and facial expressions using the PainChek system. We also evidence the positive impact of pain assessment combined with psychosocial care, on use of psychotropics and safeguarding incidents.