

Diagnosis and management of acute vertigo in the emergency department.

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Associate Professor Diego Kaski is a consultant neurologist at the National Hospital for Neurology and Neurosurgery, honorary associate professor at University College London, and honorary senior lecturer at Imperial College London. He set up and heads the Centre for Behavioural and Vestibular Neurosciences within the Department of Clinical and Movement Neurosciences at UCL and leads an active group of research exploring the neural mechanisms of spatial orientation and multisensory integration, with a strong translational element that aims to develop novel clinical biomarkers and therapies for vestibular disorders. His clinical interests are the diagnosis and treatment of dizziness, balance and eye movement disorders. He set up an acute vertigo clinic at the National Hospital for Neurology and Neurosurgery which is unique to UK. This clinic is a multi-disciplinary clinic consisting of a Neurology Consultant (DK), Clinical Scientist in Audiology (NK), Stroke Registrar, and Acute Neurology Consultant. In this clinic he sees patients from the Emergency Department and TIA service following triage by the acute vertigo team. Its main purpose is to make a rapid assessment of patients that presented to the Emergency Department within two weeks to provide a definitive diagnosis and appropriate treatment.

Dr Nehzat Koohi is a senior research fellow at the Institute of Neurology, University College London and a Clinical Scientist in Audiology at the Neuro-otology Department, University College London Hospitals. Throughout her career, she has gained clinical and academic expertise in diagnostic audiology and the assessment of outpatient audiovestibular abnormalities. Specifically, she has focused on diagnostic neuro-audiology, excelling in both clinical and academic settings. Her ultimate plan is to develop novel skills in the assessment and management of acute vertigo and hearing impairment, with a particular focus on acute audiovestibular syndromes in neurological disorders, including stroke and rare genetic disorders, as well as clinical and academic leadership skills. She works with Professor Kaski on the Acute Vertigo in Emergency Department project at the University College London Hospitals where she conducts audiological assessments on patients with acute vertigo attending the Emergency Department.

The problem

One in four adults will experience dizziness sufficient to seek medical attention. Vertigo refers to symptoms of dizziness with an illusion of movement and when arising suddenly ('acute vertigo'), these symptoms are very distressing, due to the loss of control that is experienced. Acute vertigo also represents one of the most challenging symptoms for doctors and nurses in these settings, because the causes may range from benign inner ear disorders through to life-threatening stroke or tumour. As a result, acute vertigo is managed in a non-standardised way, with unnecessary investigations, frequent misdiagnosis, and incorrect treatment. Most worryingly, acute-vertigo-related illness (e.g. due to falls) and death (e.g. due to missed stroke) are common, at an estimated cost to national health services of £3billion each year.



The key question to answer

The Acute Vertigo in the Emergency Department study supported by the UK Ménière's Society, aims to evaluate the efficacy of an 'acute vertigo toolkit' for differential diagnosis of acute vertigo in dizzy patients presenting to the Emergency Department (ED). We aim to find out how to effectively and rapidly establish the clinical indicators that point to a serious underlying pathology, versus a more benign aetiology that may require less urgent attention or investigation. Our aim is to investigate whether our proposed 'acute vertigo toolkit' can differentiate various balance disorders in dizzy patients presenting to the ED. We also aim to identify the commonest causes of acute vertigo presenting to the ED in a representative University Hospital in London, UK and record the incidence of different vestibular and non-vestibular causes of dizziness presenting to the ED.

How is it done?

Patients with a primary complaint of 'dizziness', 'unsteadiness', 'light-headedness', or 'vertigo' attending the ED will undergo routine medical assessment and investigations. In addition to the standard detailed clinical examinations in ED, patients will undergo a detailed neuro-otological examination including eye movement assessment (videonystagmography), video head impulse test, subjective visual vertical test, a bedside hearing test, and a positional ('Dix-Hallpike') manoeuvre by Prof Kaski and/or Dr Koohi no later than 30 minutes of the detailed ED medical assessment. Patients will then be followed up within two weeks in the acute vertigo clinic at UCLH. The detailed assessments will then be analysed to identify the key determinants that facilitate a precise diagnosis.

Impact

Our study, funded by the UK Ménière's Society, has significant potential to improve care for dizzy patients, streamline the use of brain scans and improve patient flow through emergency settings and reduce unnecessary hospital admissions and appointments. If such a toolbox proves to be effective, we plan to develop an educational nationwide program to help implement this widely across the NHS.

Current outputs from this study:

- Warner CL, Bunn L, **Koohi N**, Schmidtman G, Freeman J, **Kaski D**. Clinician's perspectives in using Head Impulse-Nystagmus-Test of Skew (HINTS) for Acute Vestibular Syndrome: UK experience. *Stroke Vasc Neurol* 2021 *in press*
- Mendis S, Ealing J, Larkin J, Turajlic S, Carr A, Bronstein A, **Kaski D**. Isolated imbalance due to bilateral vestibular failure following immune checkpoint inhibitor administration: two cases. *Eur J Cancer*. 2021 Aug 28;156:187-189.
- Man Chan Y, Wong Y, Khalid N, Wastling S, Flores-Martin A, Frank LA, **Koohi N**, Arshad Q, Davagnanam I, **Kaski D**. Prevalence of acute dizziness and vertigo in cortical stroke. *Eur J Neurol*. 2021 Sep;28(9):3177-3181.
- Rau C, Terling L, Elkhodair S, **Kaski D**. 92. Acute Vertigo in the Emergency Department - a retrospective study. *Eur J Emerg Med*. 2020 Sep 1;27(Suppl 1):e4-e5.
- Evangelista VRP, Mermelstein SA, da Silva MM, **Kaski D**. Bedside video-ophthalmoscopy as an aid in the diagnosis of central vestibular syndromes. *J Neurol*. 2021 Feb 4.
- Chandratheva A, Werring D, **Kaski D**. Vertebrobasilar insufficiency: an insufficient term that should be retired. *Pract Neurol*. 2020 Nov 17;practneurol-2020-2668.
- Rau CJ, Terling L, Elkhodair S, **Kaski D**. Acute vertigo in the emergency department: use of bedside oculomotor examination. *Eur J Emerg Med*. 2020 Oct;27(5):381-383.

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