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Case Report

# Yet Another Elderly Patient with Dizziness and Multimorbidity

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**2. Keywords**

Elderly; Dizziness; Multimorbidity; Polypharmacy; Postural hypotension; Cerebellar infarct

## 2. Presentation

A 78-year-old woman was admitted to the acute geriatric medicine service for a fall precipitated by worsening dizziness over 5 days, associated with left ear tinnitus. There was no preceding chest pain or breathlessness to suggest a cardiovascular event. There was also no change in vision, weakness or numbness. She has had recurrent episodes of dizziness over 6 years which was attributed to vestibular neuronitis and left benign positional paroxysmal vertigo. These episodes were transient and did not affect her function and mobility. Her current episode of dizziness gradually increased in severity over 5 days where she could not sit for prolonged periods and required assistance with ambulation. The dizziness was vertiginous, worst on sitting and standing. She had no diplopia, dysarthria or drop attacks. She had a fall 1 day prior to this admission with no major complications. Functionally, prior to this episode she was independent in her activities and instrumental activities of daily living. of note, she was recently discharged 13 days prior to this admission where she was admitted for breathlessness secondary to heart failure with preserved ejection fraction and back pain from lumbar spondylosis. She was started on furosemide 20mg OM and carvedilol increased from 3.125mg BD to 12.5mg BD.

Her medical history includes that of hypertension, hyperlipidaemia and type 2 diabetes mellitus with peripheral neuropathy and retinopathy, ischaemic heart disease and right hemipontine infarct 4 years ago, depression and lumbar spondylosis.

Her medications included amlodipine 10mg OM, valsartan 160mg OM, aspirin 100mg OM, omeprazole 20mg OM gabapentin 300mg ON, mirtazapine 15mg ON, cholecalciferol 1000 units OM, betahistine 6mg TDS PRN, fenofibrate 200mg OM, atorvastatin 60mg ON, metformin 500mg BD and insulin Mixtard 38 units pre-breakfast and 28 units pre-dinner.

## 3. Assessment

On presentation to the hospital, her blood pressure was 99/52mmHg HR 71bpm and spontaneously rose to 111/46mmHg HR 91bpm 30 minutes later. On the first day of admission, she had a symptomatic orthostatic hypotension: lying 120/80mmHg HR 60bpm and standing 100/60mmHg HR 74bpm. She was severely symptomatic and required 2 people to assist her with standing. She was clinically dehydrated.

Heart sounds were dual with no murmurs, lungs clear to auscultation. Her abdomen was soft, non-tender and no palpable bladder. Calve were supple and no pedal oedema.

On examination of her central nervous system, left sided finger-nose dysmetria was present. Pupils were equal 2mm and reactive to light, no nystagmus. Power was MRC grade 5 in all 4 limbs, sensation intact. Reflexes were 2+ throughout and plantars were downgoing.

Haemoglobin was at baseline 11.4g/dL, normochromic normocytic. White blood cell count was within normal range and there was no suggestion of infection. Corresponding to patient's clinical hypovolaemic status, urea was high at 14.9mmol/L (normal range: 2.0-6.5mmol/L). Patient's urea was 6.9mmol/L from her previous admission, and during this admission down trended to 5.9 mmol/L with IV hydration. Similarly, her creatinine was raised at 201μmol/L (normal range: 50-90μmol/L), from 128μmol/L during the previous admission, and down trended to 98μmol/L on dis-

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charge. Electrolytes were normal: sodium 136-140mmol/L, potassium 4.2–4.9mmol/L, adjusted calcium 2.56mmol/L, magnesium 0.92mmol/L and phosphate 1.42mmol/L.

ECG showed normal sinus rhythm and no ST changes.

In view of the significant symptoms, finger-nose dysmetria, relative hypotension with orthostatic hypotension superimposed on previous radiological evidence of VA narrowing, MRI/MRA brain was performed to exclude cerebellar infarct although the initial admitting diagnosis was vestibular neuronitis. Figure 1. shows the temporal evolution of her VA calibre.

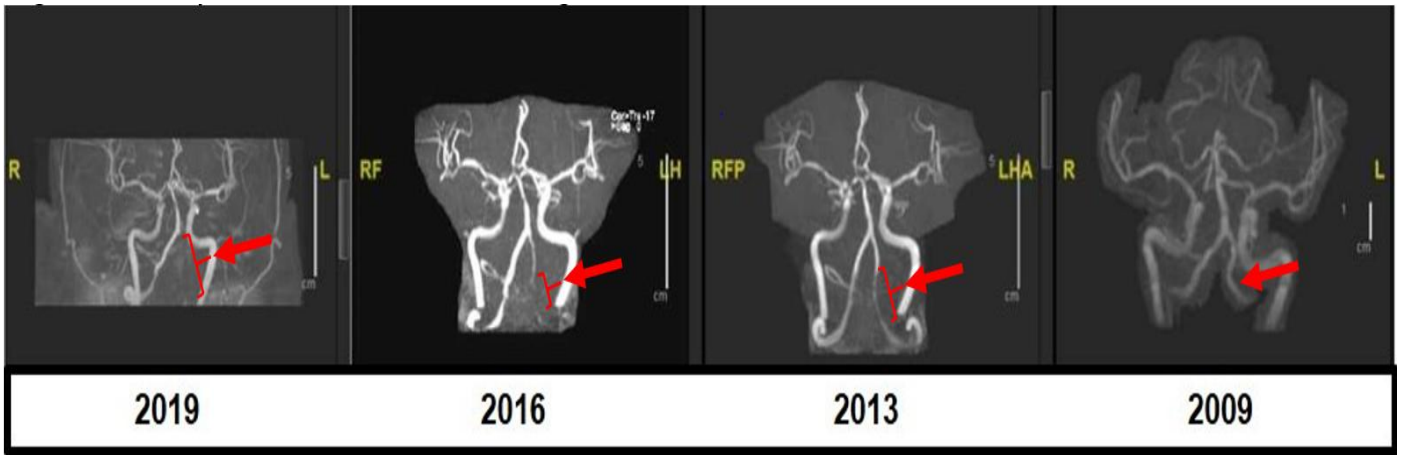


**Figure 1**: Sequence of MRI brain images

2009 (part of workup for lower limb proximal myopathy) **right VA same calibre as left VA**. No flow limiting stenosis of the major intracranial vessels.
2013 (1st presentation of giddiness) Moderate to severe narrowing of proximal left VA. Moderate attenuation of the terminal left ICA and origin of the left M1 is seen, although flow voids are preserved distally. The right A1 is hypoplastic
2016 (4th presentation of giddiness, with left dysdiachokinesis) Narrowing of the right VA at the level of the foramen magnum. Left VA noted to be hypoplastic
2019 Small focus of acute infarct in the left cerebellar tonsil. Atherosclerosis of ICA and VA with no flow signal within the left VA. Focal narrowing at the right V4 VA and right terminal ICA. Interval development of old left cerebellar fornix infarct from 2016's scan.
Arrows demarcate area of stenosis/ occlusion.

## 4. Diagnosis

MRI/MRA brain revealed left cerebellar tonsillar infarct on background of vertebrobasilar artery insufficiency from atherosclerosis, likely precipitated by orthostatic hypotension from dehydration and restrictive BP control from polypharmacy. There was also an old left cerebellar infarct.

## 5. Management

She received intravenous hydration. All her anti-hypertensives were discontinued except carvedilol, which was reduced to 3.125mg BD. Dizziness and orthostatic hypotension resolved the next day. She was back to baseline with no residual weakness or cerebellar signs. She was educated on management of her symptoms and informed to maintain her BP up to 150/90mmHg. During review at the neurology clinic one month later, there was no recurrence of dizziness. BP then was 141/65mmHg.

## 6. Discussion

With the aging population, the proportion of older adults living with two or more medical conditions is rising steadily [1]. Dizziness is a common recurrent complaint and is the strongest contributor to disability after 65 years [2]. Atypical presentation, limited history due to sensory or cognitive impairment lead to delay in appropriate diagnosis, anxiety and falls. There are numerous causes of dizziness due to vestibular and non-vestibular causes [3]. In particular, orthostatic hypotension is often forgotten. This case illustrates the significance of inappropriately normal blood pressure (BP) control in an older adult with multimorbidity.

Blood pressure control in older adults is still an ongoing discussion. The pioneer HYVET trial recommended for a BP target of 150/80mmHg [4]. More recently, SPRINT trial found a more aggressive target of systolic BP of less than 120mmHg led to superior cardiovascular outcomes, though their population was younger population excluded persons with diabetes and previous stroke [5]. Conversely, JNC8 recommends 150/90mmHg [6]. In our medical world of hard targets and definite treatment plans, moving BP target is particularly difficult to navigate. The danger lies in treatment of individual diseases in older adults with multimorbidity where clinical guidelines are often inapplicable [7]. Titrating medications in these group of older adults needs to be appropriate to the person rather than the disease [8]. The line between aging physiology and pathology is also blur, and management needs to account for this. Target BP in elderly should be looser [9] to compensate for age and disease-related stiffer vasculature, and reduced ability for cerebral autoregulation. There is high prevalence of atherosclerosis in older adults resulting in compromised cerebral flow [10]. The VERiTAS

study showed that BP less than 140/90mmHg in those with at least 50% atherosclerotic stenosis in the posterior circulation has the highest risk of subsequent stroke [11]. Furthermore, development of collateral circulation is poorer and watershed areas broaden, as seen from the previous peripheral cerebellar fornix infarct, a place where if collaterals do develop should first be revascularized. In addition, orthostatic hypotension is an independent risk factor for further stokes and should be factored in when titrating BP medications [12]. Failure to recognise normotensive as tight BP control can lead to disastrous consequences in elderly.

## 7. Conclusion

Dizziness in older adults is a common presenting complaint and it is often not easy to differentiate between peripheral or central cause due to atypical presentation, multiple comorbidities, polypharmacy and limited history. Orthostatic hypotension in the presence of cerebral atherosclerosis can precipitate cerebrovascular infarct in watershed areas [13]. Typical clinical practice guidelines are not applicable in this group of patients. The astute clinician needs to be aware of homeostenosis, the inability to effectively accommodate to physiologic stress [14], when approaching elderly with giddiness, and be mindful of this overlap between aging physiology and pathophysiology. Elderly are more vulnerable to changes which may be compensated for in younger people, and treatment has to be tailored to match this [15]. Treating individual disease in older adult with multimorbidity without considering the whole person results in harmful care.

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