Case report

Bradbury–Eggleston Syndrome in a Hypertensive Patient: A Therapeutic Challenge

ABSTRACT

Background

~~**Primary autonomic failure, also known as Bradbury–Eggleston syndrome**~~ **Pure autonomic failure (PAF), historically known as Bradbury–Eggleston syndrome**, is a neurodegenerative disorder of the autonomic nervous system characterized by orthostatic hypotension.

Case Summary

We report the case of a 69-year-old woman with a history of arterial hypertension who presented with exertional dizziness. She exhibited supine systolic hypertension at rest, along with orthostatic hypotension without a compensatory tachycardic response, suggestive of autonomic dysfunction. Neurological examination was normal. Cardiovascular autonomic testing revealed beta-sympathetic impairment associated with neurogenic orthostatic hypotension. Secondary causes of dysautonomia were excluded, leading to the diagnosis of ~~**primary**~~ **pure** autonomic failure. Although the management of coexisting hypertension and orthostatic hypotension is challenging, a significant improvement in the patient's functional status and blood pressure control was achieved through a personalized therapeutic approach.

Discussion

The aim of this case report is to emphasize the importance of assessing autonomic function and blood pressure variations in hypertensive patients presenting with orthostatic symptoms, in order to implement appropriate and individualized therapeutic strategies~~**patients**~~. These predictors, however, need further work to validate reliability.

*Keywords: Bradbury–Eggleston Syndrome, Hypertensive patient, ~~**primary**~~ **pure** autonomic failure, orthostatic hypotension.*

1. INTRODUCTION

~~**Primary**~~ **pure** autonomic failure, also known as Bradbury–Eggleston syndrome, is a rare neurodegenerative disorder of the autonomic nervous system, characterized by neurogenic orthostatic hypotension (1). It results from postganglionic sympathetic impairment, leading to an inadequate cardiovascular response to postural changes (2). Management is particularly challenging when this condition coexists with supine arterial hypertension, a situation frequently observed in elderly patients.

2. CASE PRESENTATION

We report the case of a 69-year-old woman with a long-standing history of arterial hypertension treated with antihypertensive medication, who presented with recurrent dizziness occurring during exertion and upon standing, with a progressive limitation of daily activities. She did not report frank syncope, chest pain, or palpitations. There was no known neurological history and ~~no recent medication use that could account for the symptoms~~ **no recent change in medication or use of drugs known to induce orthostatic hypotension**.

On initial clinical examination, the patient exhibited elevated systolic blood pressure in the supine position, measured at 162/81 mmHg, with a stable heart rate. Upon standing, a marked drop in blood pressure was observed as early as the third minute, reaching 92/50 mmHg, without a compensatory increase in heart rate. This absence of reflex tachycardia was suggestive of neurogenic orthostatic hypotension. The cardiovascular examination was otherwise unremarkable. Neurological examination was strictly normal, with no evidence of central, pyramidal, extrapyramidal, or cerebellar involvement.

Electrocardiography showed sinus rhythm without conduction or repolarization abnormalities. Transthoracic echocardiography revealed moderate left ventricular hypertrophy related to chronic hypertension, without significant systolic or diastolic dysfunction and no other structural abnormalities.

Given the suspicion of dysautonomia, cardiovascular autonomic testing was performed. These investigations demonstrated impaired beta-sympathetic responses, with neurogenic orthostatic hypotension confirmed during head-up tilt testing. Vagal responses were also reduced, reflecting a global impairment of cardiovascular autonomic control (Table 1).

An extensive etiological workup was conducted to exclude secondary causes of autonomic dysfunction. Laboratory investigations, including metabolic, endocrine, vitamin, and infectious assessments, were normal. Brain imaging showed no abnormalities suggestive of central neurological involvement. In the absence of an identifiable secondary cause, a diagnosis of ~~primary~~ **pure** autonomic failure was established.

Therapeutic management relied on a personalized approach, addressing the dual objective of controlling supine hypertension while correcting daytime orthostatic hypotension. Non-pharmacological measures were implemented as first-line therapy, including patient education on gradual postural changes, increased daytime salt and fluid intake, the use of compression stockings, and avoidance of situations promoting vasodilation. Elevation of the head of the bed was also recommended.

From a pharmacological perspective, antihypertensive therapy was adjusted in favor of a short-acting agent administered in the evening (captopril 25 mg), allowing control of supine blood pressure without worsening daytime orthostatic hypotension. In parallel, a low-dose sympathomimetic agent was introduced in the morning (etilefrine 20 mg) to improve orthostatic tolerance. Close blood pressure monitoring and regular clinical follow-up were instituted.

Under this combined therapeutic strategy, a progressive improvement in symptoms was observed, with better exercise tolerance and a significant reduction in dizziness episodes, reflecting an improvement in the patient's functional and hemodynamic status.

3. DISCUSSION

~~Primary~~ pure autonomic failure is a rare and often underrecognized condition, whose diagnosis relies on a combination of clinical and paraclinical criteria established by the American Autonomic Society and the American Academy of Neurology in 1996 (1). It results from dysfunction of peripheral sympathetic innervation, leading to impaired catecholamine release. This alteration causes an inadequate cardiac and peripheral vasomotor response to standing, thereby promoting orthostatic hypotension and other manifestations of autonomic dysfunction (2). Orthostatic hypotension represents the cardinal feature of the disease (3); however, its recognition may be delayed in hypertensive patients, in whom symptoms are sometimes incorrectly attributed to antihypertensive therapy or physiological aging.

In this context, the absence of reflex tachycardia during blood pressure decline is a key feature supporting a neurogenic origin. Cardiovascular autonomic testing plays a central role in diagnostic confirmation, allowing objective assessment of sympathetic and parasympathetic deficits and guiding etiological evaluation (4).

The coexistence of supine arterial hypertension and orthostatic hypotension represents a major therapeutic challenge (1). Intensification of antihypertensive therapy may worsen orthostatic symptoms, whereas treatments aimed at correcting hypotension may exacerbate nocturnal hypertension. This complex situation requires an individualized management strategy based on a balanced combination of non-pharmacological measures and pharmacological therapies, together with close clinical monitoring. Several agents are approved by the Food and Drug Administration for the treatment of orthostatic hypotension, including midodrine, droxidopa, pyridostigmine, and fludrocortisone (5).

With regard to supine hypertension, the use of transdermal agents such as nitroglycerin or clonidine may be considered, as well as short-acting oral antihypertensive medications, including captopril, nifedipine, losartan, or nebivolol (6).

Beyond therapeutic considerations, this case highlights several important practical lessons. First, it emphasizes the importance of systematically measuring blood pressure in both supine and standing positions in hypertensive patients presenting with suggestive symptoms. Second, it underlines that orthostatic hypotension without an appropriate compensatory chronotropic response should raise suspicion of dysautonomia, even in the absence of associated neurological signs. Finally, it illustrates the benefit of a personalized and gradual approach, which can significantly improve patients' quality of life despite the absence of curative treatment for ~~primary~~ pure autonomic failure.

Table 1 : Autonomic Testing Results

Autonomic test	Heart rate response	Blood pressure response
DeepBreathing	Vagal response of 5% (normal ≥10%) (HR: 56–62 bpm)	BP variability showing a mild decrease from 156/79 to 148/77 mmHg
Hand Grip Test	Vagal response of 9% (normal ≥10%) (HR: 66–72 bpm)	Peripheral alpha-sympathetic response of 6% Increase in BP from 147/65 to 157/74 mmHg
Hyperventilation	Increase in HR from 62 bpm to 83 bpm	Increase in BP from 148/82 to 156/77 mmHg, associated with ventricular premature beats and dizziness

Autonomic test	Heart rate response	Blood pressure response
Mental Stress Test	Central beta-sympathetic response of 5% (normal ≥10%) Increase in HR from 58 to 61 bpm	Central alpha-sympathetic response of 11% (normal ≥10%) Increase in BP from 147/74 mmHg to 166/76 mmHg
Active Orthostatic Test	Vagal response of 11% (normal ≥10%) (HR: 63–70 bpm) During initial orthostasis, HR increased from 63 to 70 bpm, then gradually rose to 73 bpm at the 15th minute	During initial orthostasis, BP dropped from 162/81 to 92/50 mmHg, then fluctuated between 97/58 and 102/60 mmHg at the 5th minute, corresponding to a systolic decrease of approximately 60 mmHg, which persisted until the 15th minute (110/61 mmHg), associated with intense dizziness, cold extremities, and cramps, consistent with orthostatic hypotension
	After return to supine position, HR remained low at 58 bpm	After return to supine position, blood pressure was 152/67 mmHg

HR : heart rate ; BP : blood pressure, bpm : beats per minute

4. CONCLUSION

This clinical case underscores the need for a thorough evaluation of autonomic function in hypertensive patients presenting with orthostatic symptoms. Early recognition of ~~primary~~ **pure** autonomic failure allows the implementation of appropriate, individualized management strategies that can significantly improve functional prognosis and quality of life.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

.

1. The Consensus Committee of the American Autonomic Society and the American Academy of Neurology. (1996). Consensus statement on the definition of orthostatic hypotension, pure autonomic failure, and multiple system atrophy. Neurology, 46(5), 1470. https://doi.org/10.1212/wnl.46.5.1470
2. El-Mhadi, S., Mouine, N., Benjelloun, H., Aboudrar, S., & El Bakkali, M. (2024). Primary autonomic failure: a complex case of orthostatic hypotension in a hypertensive elderly patient. European heart journal. Case reports. https://doi.org/10.1093/ehjcr/ytae073
3. Bradbury, S., & Eggleston, C. (1925). Postural hypotension: A report of three cases. American Heart Journal. https://doi.org/10.1016/S0002-8703(25)90007-5
4. Gibbons, C. H., Schmidt, P., Biaggioni, I., Frazier-Mills, C., Freeman, R., Isaacson, S., Karabin, B., Kuritzky, L., Lew, M., Low, P., Mehdirad, A., Raj, S. R., Vernino, S., & Kaufmann, H. (2017). The recommendations of a consensus panel for the screening, diagnosis, and treatment of neurogenic orthostatic hypotension and associated supine hypertension. Journal of Neurology, 264(8), 1567–1582. https://doi.org/10.1007/s00415-016-8375-x
5. Singer, W., Sandroni, P., Opfer-Gehrking, T. L., Suarez, G. A., Klein, C. M., Hines, S., O'Brien, P. C., Slezak, J., & Low, P. A. (2006). Pyridostigmine treatment trial in neurogenic

orthostatic hypotension. Archives of neurology, 63(4), 513–518. https://doi.org/10.1001/archneur.63.4.noc50340
6. Shibao, C., Okamoto, L., &Biaggioni, I. (2012). Pharmacotherapy of autonomic failure. Pharmacology & therapeutics, 134(3), 279–286. https://doi.org/10.1016/j.pharmthera.2011.05.009