# Sacubitril/valsartan improves hypertension, nighttime blood pressure and heart failure: a case-report

Takeshi Takami
Clinic Jingumae, Kashihara, Japan

## Objective

Sacubitril/valsartan, a neprilysin inhibitor/ angiotensin receptor blocker (ARB) combination, has been shown to effectively reduce ambulatory 24-h blood pressure in patients with hypertension. Improvements in heart failure have also been reported. This case report highlights the validity of sacubitril/valsartan for the treatment of hypertension, nocturnal hypertension and heart failure.

## Clinical course up to our clinic

Patient: 75-year-old hypertensive male with heart failure

Chief complaint: Shortness of breath when walking on flat ground

Past history: Diagnosed with severe essential hypertension without DM, dyslipidemia, coronary artery disease, stroke, or valvular heart disease 15 years earlier.

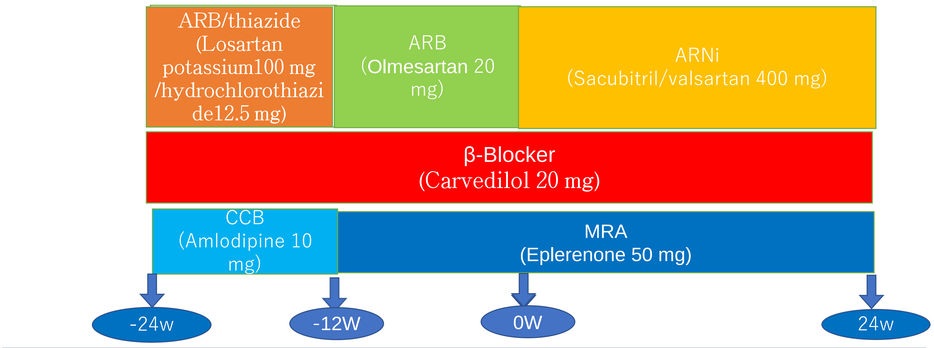
He was referred to us from another clinic 1 year earlier.

## Findings at first visit to our clinic

Symptoms: Shortness of breath on exertion, palpitations.
Vital signs: BP 175/85 mmHg, HR 95 bpm, $SpO_2$ (on room air) 95%
Physical examination: edema of both lower extremities
Heart failure data: NT-pro BNP 868 pg/mL, EF 40.5%,
Arterial stiffness data: cSBP 175 mmHg, AI 91%
Cardiac hypertrophy data: LVMI 128.5 g/m²
Medication prescribed by previous doctor: amlodipine 10 mg, candesartan 20 mg.

## Table 1. Transition of treatment

| Period 1 (12 weeks) | Period 2 (12 weeks) | Period 3 (24 weeks) |
|---|---|---|
| ARB/thiazide (Losartan potassium100 mg /hydrochlorothiazide 12.5 mg) | ARB (Olmesartan 20 mg) | ARNi (Sacubitril/valsartan 400 mg) |
| β-Blocker (Carvedilol 20 mg) | β-Blocker (Carvedilol 20 mg) | β-Blocker (Carvedilol 20 mg) |
| Ca-channel blocker (CCB) (Amlodipine 10 mg) | Mineralocorticoid receptor antagonist (MRA) (Eplerenone 50 mg) | MRA (Eplerenone 50 mg) |

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|---|---|---|---|---|
| NT-proBNP (pg/mL) | 868 | 721 | 656 | 325 |
| EF (%) | 45 | 41.5 | 39.5 | 51.2 |
| BP (mmHg) | 170/85 | 155/80 | 154/71 | 132/72 |
| cSBP (mmHg) | 175 | 162 | 154 | 135 |
| LVMI (g/m²) | 128.5 | 128.3 | 127.3 | 119.6 |

## Treatment progress at our clinic

After period 1 of treatment: blood pressure: 155/80 mmHg, heart rate: 65 bpm, NT-pro BNP: 721 pg/mL, EF: 41.5%,

cSBP: 162 mmHg, LVMI: 128.3 g/m², no improvement in symptoms.

Hence, treatment changed from period 1 to period 2.

After period 2 of treatment (pre period 3): Inadequate response.

Hence, treatment changed from period 2 to period 3.

Since period 3 of treatment (pre period 4) showed an inadequate response, treatment was changed from period 3 to period 4.

## Table 2. Comparison of changes in blood pressure before and after treatment period 3

| | Pre period 3 | Post period 3 |
|---|---|---|
| Brachial blood pressure (mmHg) | 154/71 | 132/72 |
| Central systolic blood pressure (mmHg) | 154 | 135 |
| Heart rate (bpm) | 68 | 65 |
| Daytime blood pressure (mmHg) | 135/68 | 134/63 |
| Nocturnal blood pressure (mmHg) | 136/65 | 121/67 |

## Table 3. Comparison of transthoracic echocardiology results before and after treatment period 3

| | Pre period 3 | Post period 3 |
|---|---|---|
| EF (%) (Simpson) | 39.5 | 51.2 |
| LVMI (g/m²) | 127.3 | 119.6 |
| TR (m/s) | 2.91 | 2.65 |
| LA diameter (mm) | 40.1 | 37.8 |
| Septal E/e' | 15.1 | 14.5 |
| Septal e' | 3.1 | 3.3 |

## Table 4. Comparison of laboratory data before and after treatment period 3

| | Pre period 3 | Post period 3 |
|---|---|---|
| NT-pro BNP (pg/mL) | 656 | 325 |
| HbA1c (%) | 5.6 | 5.7 |
| LDL-chol (mg/dL) | 118 | 108 |
| HDL-chol (mg/dL) | 54 | 55 |
| TG (mg/dL) | 108 | 98 |
| eGFR (%) | 54.8 | 53.8 |
| Na (mEq/L) | 142 | 141 |
| K (mEq/L) | 4.2 | 4.1 |
| Cl (mEq/L) | 108 | 106 |
| AST (IU/L) | 21 | 23 |
| ALT (IU/L) | 25 | 26 |
| Hb (g/dL) | 12.9 | 13.1 |

## Conclusion

- In our patient, changing from an ARB to sacubitril/valsartan resulted in an improvement in nighttime and central blood pressure, left ventricular hypertrophy and diastolic function, and recovery of EF, with a change from heart failure with reduced ejection fraction (HFrEF) to heart failure with preserved ejection fraction (HFpEF). His NT-proBNP levels and heart failure symptoms also improved.
- Our experience suggests that sacubitril/valsartan might be useful in patients with heart failure who have nocturnal hypertension.

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COI Disclosure

Takeshi Takami

**The authors have no financial conflicts of interest to disclose concerning the presentation.**