

HYPERTENSION IN DIALYSIS PATIENTS

A consensus document by the EURECA-m working group of the ERA-EDTA and the Hypertension and the Kidney working group of the ESH

Journal of Hypertension. 2017; 35:657-676.¹

KEY FINDINGS

Persistent hypertension is observed in the majority of dialysis patients, making it a fundamental and unmet challenge in dialysis. Presented here are **important excerpts** from a consensus document featured in the *Journal of Hypertension* that outlines the diagnosis, epidemiology, pathogenesis, and treatment of hypertension in patients on dialysis.



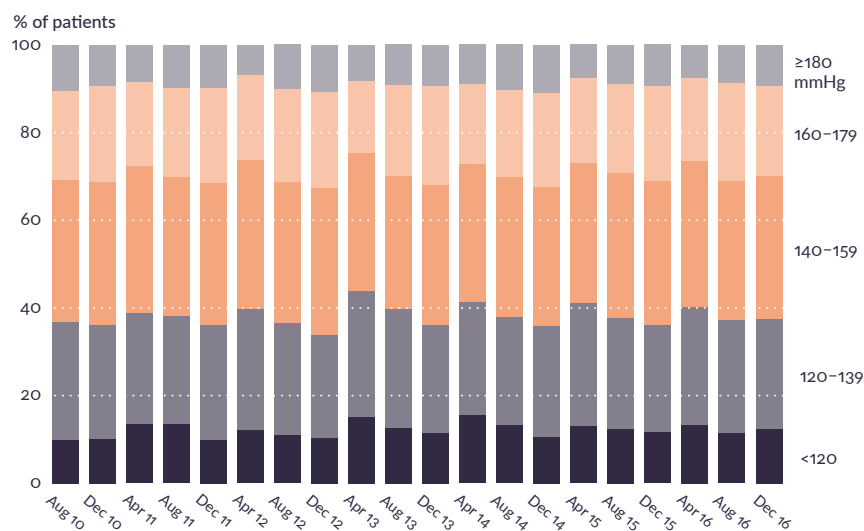
This document is one in an ongoing series focused on recent articles, clinical findings, or guidelines for applied clinical practice related to issues affecting dialysis patients. For additional content, visit AdvancingDialysis.org

POTENTIAL SOLUTION

Sodium and volume excess appear to be the most important causes of hypertension in dialysis patients; therefore, nonpharmacologic strategies such as dietary sodium restriction, individualized dialysate sodium prescription, and increased treatment length and frequency should be the initial therapeutic approaches to control blood pressure (BP).

Problem: no progress in blood pressure control

Among US patients, pre-dialysis systolic blood pressure is unchanged. The majority of patients have SBP >140 mmHg.²



PATHOPHYSIOLOGY OF HYPERTENSION

VOLUME OVERLOAD In patients with ESRD, even when residual renal function is preserved, the sodium and fluid excretory capacity is substantially impaired. Thus, sodium retention and volume overload is very common and often not easily identifiable. Moreover, ESRD patients have the highest sodium-sensitivity of BP. It is now well documented that in addition to classical osmotic volume expansion, sodium retention may occur in the form of osmotically inactive sodium in the connective tissue and the skin where sodium accumulates linked to glycosaminoglycans.

Until fluid and sodium overload is removed during dialysis, a rise in peripheral vascular resistance will sustain hypertension in these individuals.

MECHANISMS OF HYPERTENSION

- Volume overload
- Arterial stiffness increase
- Sympathetic nervous system activation
- Renin-angiotensin-aldosterone system activation
- Endothelial dysfunction
- Sleep apnea
- Erythropoietin-stimulating agents

HYPERTENSION IN DIALYSIS PATIENTS

EURECA-m TREATMENT GUIDELINES¹

Management of hypertension in dialysis patients should focus at correction of the primary pathogenetic mechanism, that is sodium and volume excess, by carefully implementing a series of nonpharmacological measures to achieve the dry-weight for each individual patient and to avoid intradialytic sodium loading.

Administration of antihypertensive drug therapy in dialysis patients considered to be volume overloaded should follow the attainment of dry-weight.

REDUCE SALT INTAKE

Reducing the amount of sodium gained from diet or dialysate fluid is critical to achieve BP control.

Dietary sodium restriction appears to be an effective approach to limit the sense of thirst, reduce interdialytic weight gain and facilitate the achievement of dry-weight and BP control.

INDIVIDUALIZE DIALYSATE SODIUM

[Recent research has] emphasized that a high-dialysate sodium concentration may increase thirst and interdialytic weight gain.

A consensus document by the Chief Medical Officers of US Dialysis Providers warns against the use of dialysate with a sodium concentration exceeding predialysis serum sodium.

INCREASE TREATMENT LENGTH & FREQUENCY

Short delivered dialysis can be an important barrier to the achievement of adequate BP control. The European Best Practice guidelines recommend that the length of the dialysis session must not be decided only on the grounds of optimal Kt/V and that hemodialysis patients should receive at least three dialysis sessions of 4 hours each, per week.

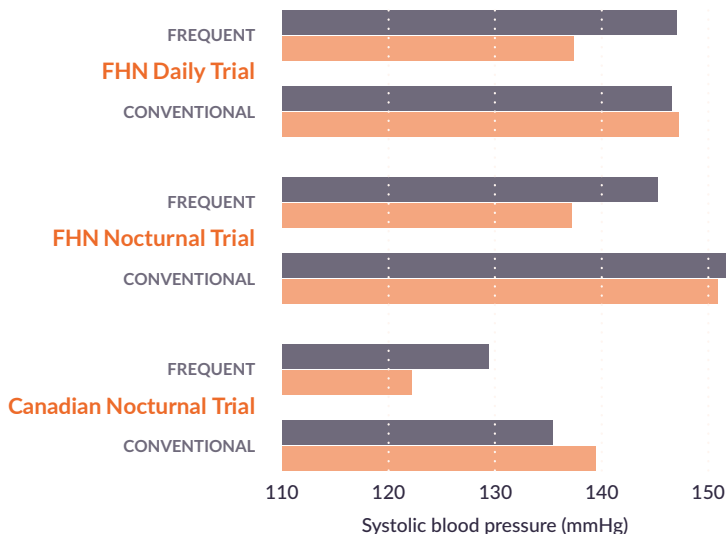
Increasing the duration of dialysis may represent an additional approach to control BP among dialysis patients who remain hypertensive despite the intensification of volume withdrawal or experience frequent episodes of intradialytic hemodynamic instability during this intensification process within their usual dialysis regimen.

Patients assigned to longer or more frequent dialysis regimens achieve better BP control with reduced requirements for antihypertensive medications.

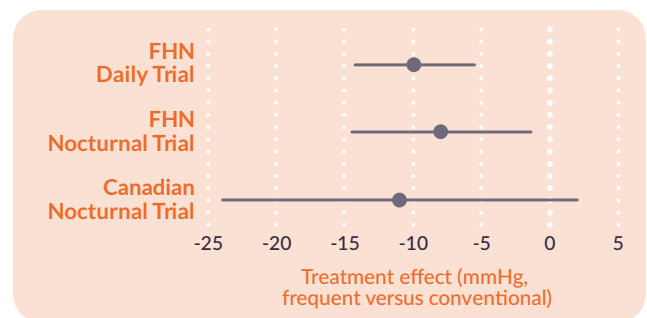
APPLYING MORE FREQUENT HEMODIALYSIS AS A STRATEGY TO REDUCE BLOOD PRESSURE AND USE OF ANTIHYPERTENSIVE MEDICATIONS

REDUCED BLOOD PRESSURE^{3,4}

Systolic blood pressure



■ At baseline ■ At end of study



HYPERTENSION IN DIALYSIS PATIENTS

APPLYING MORE FREQUENT HEMODIALYSIS AS A STRATEGY TO REDUCE BLOOD PRESSURE AND USE OF ANTIHYPERTENSIVE MEDICATIONS

REDUCED NEED FOR ANTIHYPERTENSIVE MEDICATION^{3,5}

Mean number of prescribed antihypertensive medications per patient

FHN Daily Trial

CONVENTIONAL

2.3

2.2

FREQUENT

2.0

1.4

baseline end of study

FHN Nocturnal Trial

FREQUENT

1.9

1.6

CONVENTIONAL

1.6

1.1

baseline end of study

FREEDOM Study

FREQUENT

1.7

1.0

baseline end of study

For supporting details, methodology, and resources—as well as the other topics concerning more frequent hemodialysis—visit AdvancingDialysis.org.

AdvancingDialysis.org is dedicated to providing clinicians and patients with better access to and more awareness of the reported clinical benefits and improved quality of life made possible with home dialysis, including more frequent, solo, more intensive, and nocturnal therapy schedules.

All forms of hemodialysis, including treatments performed in-center and at home, involve some risks. When vascular access is exposed to more frequent use, infection of the site, and other access related complications may also be potential risks. In addition, there are certain risks unique to treatment in the home environment. Patients differ and not everyone will experience the reported benefits of more frequent hemodialysis.

Certain risks associated with hemodialysis treatment are increased when performing solo home hemodialysis because no one is present to help the patient respond to health emergencies.

Certain risks associated with hemodialysis treatment are increased when performing nocturnal therapy due to the length of treatment time and because therapy is performed while the patient and care partner are sleeping.

AdvancingDialysis.org is a project of NxStage Medical, Inc.

¹Sarafidis PA, et al. Hypertension in dialysis patients: a consensus document by the European Renal and Cardiovascular Medicine (EURECA-m) working group of the European Renal Association European Dialysis and Transplant Association (ERA-EDTA) and the Hypertension and the Kidney working group of the European Society of Hypertension (ESH). *Journal of Hypertension*. 2017; 35:657–676.

²DOPPS <http://www.dopps.org/DPM/>

³Kotanko P, Garg AX, Depner T, et al. FHN Trial Group. Effects of frequent hemodialysis on blood pressure: Results from the randomized frequent hemodialysis network trials. *Hemodial Int*. 2015 Jul;19(3):386–401. doi: 10.1111/hdi.12255. PMID: 25560227.

⁴Culleton BF, Walsh M, Klarenbach SW, et al. Effect of frequent nocturnal hemodialysis vs conventional hemodialysis on left ventricular mass and quality of life: a randomized controlled trial. *JAMA*. 2007;298(11):1291–9.

⁵Jaber BL, Collins AJ, Finkelstein FO, et al. Daily hemodialysis reduces the need for anti-hypertensive medications. Abstract. *Renal Week 2009*, San Diego, CA.