

Nephroprotection in the very elderly patient

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Abstract

Nephroprotection consists of a set of measures to attempt to prevent or slow kidney damage. Primary nephroprotection is the term used when such measures seek to reduce the risk of installing an acute renal failure; and secondary prevention or nephroprotection is used when attempting to slow the progression of chronic renal failure. Regarding nephroprotection, the measures implemented for this purpose in young and very elderly (age >75 years) patients are often similar, based on the modulation of the diet, blood pressure levels, hemoglobin and glycosylated hemoglobin, and the type and dose of medication delivered. However, given that those objectives can induce complications in the very elderly, less strict targets must be sought, while respecting certain well-defined limits.

Key words: Nephroprotection, chronic renal failure, very elderly (MeSHsource).

Nefroprotección en el paciente muy anciano

Resumen

La nefroprotección es un conjunto de medidas destinadas a intentar prevenir o ralentizar el daño renal, solándose emplear el término nefroprotección primaria cuando dichas medidas buscan reducir el riesgo de instalación de una insuficiencia renal aguda; y el de prevención secundaria o nefroprotección, cuando pretenden enlentecer la progresión de una insuficiencia renal crónica. Con respecto a la nefroprotección, las medidas implementadas para tal fin, en pacientes jóvenes y muy ancianos (edad >75 años), suelen ser similares, basadas en la modulación de la dieta, cifras de tensión arterial, valores de hemoglobina y hemoglobina glicosilada, así como en el tipo y dosis de medicación suministrada. Sin embargo, dado que dichos objetivos pueden inducir complicaciones en los muy ancianos, deben muchas veces buscarse objetivos más laxos, aunque respetando ciertos límites bien definidos.

Palabras clave: Nefroprotección, insuficiencia renal crónica, muy anciano (fuente DeCS).

Introduction

The increase in life expectancy in Western societies has led to an unprecedented epidemiological phenomenon: the increase of a significant number of people over 75 years, which, in turn, has resulted in an increase in the number of very elderly patients in the population of people living with chronic kidney disease¹⁻⁴.

Nephroprotection is a set of measures attempting to prevent or slow renal damage. The term primary nephroprotection is used to refer to measures attempting to reduce the risk of installation of acute renal disease, and the term secondary prevention or nephroprotection is used when they attempt to slow the progression of chronic kidney disease⁵⁻⁸.

It is important to remark that nephroprotection measures remain extremely useful even in very elderly patients with chronic renal failure, not only because they can ensure that these patients can get to live the rest of their lives without dialysis, but also because renal protection measures also work as a cardiovascular and neuronal protection; i.e. also contribute to reducing the morbidity of other vital parenchymas^{7,9}.

However, although renal protection strategies are similar among the different age groups, given the existing physiological differences between young and very elderly patients, such strategies might require changes in patients older than 75 years. It is advisable, then, in this population to start seeking the classic targets of nephroprotection (young adult), but reassessing whether these measures cause any complications. If that is the case, those targets must be readjusted to others which are designed for the physiology of the very elderly, as will be exposed in detail below¹⁰.

Diet and sodium

Normal elderly people have a diminished capacity of sodium reabsorption both at the ascending limb of loop of Henle (reduction in the number of sodium transporters) and the collecting duct (resistance to aldosterone). This is the reason why soduria is in-

creased in the elderly population, and therefore, a prolonged low-sodium diet can induce complications secondary to a negative cumulative excessive balance of sodium: hypovolemia, arterial hypotension, hyponatremia with low extracellular fluid or hyperkalemia. The latter disturbance is induced by a combination of a smaller supply of sodium to the distal nephron (promoter of potassium secretion) and the abovementioned resistance to aldosterone. Therefore, in this context, a normosodic diet may be more suitable for very elderly patients¹⁰⁻¹³.

Diet and proteins

The elderly usually have a progressive reduction of their lean body mass, a phenomenon known as sarcopenia¹⁴. If such sarcopenia deepens, it may lead to the development of a frailty syndrome, thereby increasing morbidity and mortality¹⁴⁻¹⁶. A low-protein diet in this population may not only bring potential malnutrition, but also deepens their sarcopenia. Therefore, in this context, a normal-protein diet may be more suitable for the very elderly patients¹⁰.

Hemoglobinemia

The target of a serum hemoglobin of 11 g/dl may be insufficient for some very elderly patients, fostering in them the appearance of asthenia and even reduction in their intellectual abilities (impaired cognition test). It is for this reason that chronic renal insufficient patients over 75 years may require a hemoglobinemia target of 11.5-12 g/dl^{10,17,18}.

Blood pressure

The target blood pressure of <130/80 may be a detrimental target in the very elderly population, as it may expose them to symptomatic hypotension (fainting), and risk of falls and fractures. It is, therefore, recommended in this age group, a target blood pressure of $\leq 140/150$ mmHg (systolic) and ≤ 80 mmHg (diastolic) (the latter must not be less than 60 mmHg, as it implies coronary risk)^{10,19-25}.

Glycosylated hemoglobin

In very elderly diabetic patients, seeking glycosylated hemoglobin levels lower than 7% may mean risk of hypoglycemia, falls and fractures. For this reason, glycosylated hemoglobin targets lower than 7.5-8.5% are sought, according to the cognitive status and number of comorbidities the elderly has: the most fragile, the higher the glycosylated hemoglobin target, within the abovementioned range^{10,26-28}.

Medication

With regard to medication, there are at least four aspects to consider²⁹⁻⁵⁰:

- a) Nephrotoxic drugs: If possible, avoid the use of potentially nephrotoxic medication, nephroprotection measures are useful for any age group, but especially for the very elderly, given their propensity to kidney damage.
- b) Adjusting of the prescribed dose: In this population, it is very difficult that a drug does not require any dose adjustment, given the combination of the following pharmacokinetic changes: reduced glomerular filtration rate, decreased hepatic metabolism and reduction of body surface.
- c) Polypharmacy: Try to avoid or at least minimize polypharmacy, a situation that causes the appearance of interactions which may be potentially nephrotoxic, in particular, and harmful, in general.
- d) Anti-proteinuria medication: Because of senile glomerular changes (senile glomerulosclerosis), a proteinuria level of up to 0.3 grams/day may be considered normal in the elderly. For this reason, proteinuria target in the very elderly with chronic nephropathy is less than 0.5 g/day. For this purpose, medications such as Angiotensin conver-

ting enzyme inhibitors or Angiotensin II receptor antagonists may be used. However, if these cause hypotension, hyponatremia, hyperkalemia or even deterioration of renal function, despite being well-measured doses, their withdrawal is recommended.

Conclusion

The therapeutic targets designed for nephroprotecting the very elderly population are similar to those of young people, with the difference that they may be required to be more flexible while respecting certain pre-established limits.

Interest Conflict

The authors declare no conflict of interest.

Table 1

Therapeutic targets in the very elderly patient with chronic kidney failure.	
Targets	
Diet	Hypo or normosodic Hypo or normal-protein
Hemoglobin (g/dl)	11 - 12
Blood pressure (mmHg)	150/140 - 80
Hemoglobin A1C (%)	7- 8.5
Medication	Non-nephrotoxic Adjusted to GF No polipharmacy
GF: glomerular filtration, ACE inhibitors: Angiotensin converting enzyme inhibitors. AIIRA: Angiotensin II receptor antagonists.	

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