Fişa suspiciunii de plagiat / Sheet of plagiarism's suspicion	Indexat la: 85/07

Opera suspicionată (OS) Suspicious work	Opera autentică (OA) Authentic work

OS	Tuță, L.A., Stăniguț, A., Câmpineanu, B., Zica, R., "Evolution of moderate chronic kidney disease in the elderly", *ARS Medica Tomitana,* vol.68, No.1, p.41 – 45, 2012.
OA	Heras Benito, M., Fernández-Reyes L.M.J, Sánchez Hernández, R., Guerrero Díaz, M.T., Muñoz Pascual, A., Macías, M.C., Molina, A., Prado, F., Álvarez-Ude, F., "Elderly patients with chronic kidney disease: what is their course at one year?", *Nefrología, vol.*28, No.3, p.325-328, 2008.

Incidența minimă a suspiciunii / Minimum incidence of suspicion	
p.41:01s – p.41:20s	p.325:01s – p.325:22s
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VERSITA

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Evolution Of Moderate Chronic Kidney Disease In The Elderly

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ABSTRACT. Recently, there is an increased interest in the detection of Chronic Kidney Disease (CKD) in the general population, especially . A classification of CKD, based on several stages of the estimated glomerular filtration rate (eGFR), has been established from almost 10 years. In our study we monitored eighthy patients older than 65 years, clinically and biochemically, during one year. A number of 80 clinically stable patients, with a median age of 74 years, recruited between october and december 2010, were followed up during one year. We separated them in two groups: Group 1: 40 patients with serum creatinine < = 1,2 mg/dl (range 0,7-1,2) and with no proteinuria; and Group 2: 40 patients with serum creatinine > 1.2 mg/dl (range 1,2-3,5) and with proteinuria < 3,5 g/24 hours. We measured serum creatinine and eGFR at the time of recruitment and after one year of follow up using abreviated MDRD equation. Statistical comparisons were made using the general lineal model for repeated measures of the SPSS 11.0 program. The most frequent comorbidities were cardio-vascular(> 75%) and infections (25%). 13.75% of the patients died during the follow up, especially from group 2. Only 25% of group 2 patients needed erithropoietin (EPO) treatment. Estimated GFR and proteinuria remained relatively stable at the end of one year in patients from group 1, but survivors from group 2 registered a median decrease of 9 mL/min.

Key words: Creatinine, Chronic kidney disease, Glomerular Filtration Rate, Elderly

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Introduction

The process of aging is associated to a number of changes in the structure and function of various organs, including the kidneys [1]. After the age of 65, the glomerular filtration rate (GFR) decreases at an average rate of 0.8 mL-1 mL/min/year [2]. It is known that a marked decrease in GFR (<60mL/min/1.73sqm) induces various manifestations associated to chronic renal failure (CRF), including anaemia, mineral bone disease, metabolic acidosis [3-5], etc.

On the other hand, an increased interest is currently being paid to early detection of «occult kidney disease» in the general population, from GFR estimation. For this purpose, a number of mathematical equations based on serum creatinine (SCr) have been devised. Thus, depending on GFR, chronic kidney disease (CKD) is divided into several stages. A GFR ranging from 60 and 30 mL/min is considered indicative of stage 3 CKD [6]. This classification has been considered applicable to the whole population, in spite of the fact that a patient of 75 years old woman with normal serum creatinine (1,1 mg/dl) has an estimated GFR of 48 mL/min (CKD stage 3).

Recent studies [7, 8] reported that all elderly patients, including those with SCr values within the normal range, already had decreased GFR values, approximately 30% already included in stage 3. Today, a laboratory finding of a decreased GFR in asymptomatic elderly patients with no other associated signs of CKD (anaemia, etc.) is a reason for referral to the nephrology outpatient clinic. This study was therefore intended to establish whether such classification has a practical value in this specific group of patients or is only imposing an unnecessary

overload on nephrology clinics. For this purpose, a clinical a laboratory monitoring was performed in a group of patients over 65 years of age, analysing the changes in their kidney function and their morbidity and mortality for one year.

Material and Methods

Patients

Eighty patients > 65 years of age (mean, 74.2 ± 6.5 years; range, 66-90 years) seen during the October-December 2010 period were enrolled. Of these, 40 patients were recruited at the geriatrics outpatient clinic (Group 1, SCr <1.2 mg/dL (range 0.7-1.2) and 40 patients at the nephrology outpatient clinic (group 2, SCr > 1.2 mg/dL (range 1.2-3.5). Overall, 72.5% of patients were females (75% in group 1 and 70% in group 2, $p < 0.005$). A history of diabetes mellitus (DM) and high blood pressure (HBP) was found in 35% and 77.5% of patients respectively. Comparison of both groups showed no significant differences in DM or HBP distribution. Study patients were clinically stable and underwent a clinical and laboratory re-evaluation one year later.

Patient distribution by CKD stage at baseline using the abbreviated MDRD formula was: stage 1, 0%; stage 2, 30%; stage 3, 60%; stage 4, 10%; stage 5, 0%.

Established treatments were with statins, antihypertensives, calcium salts, iron, and erythropoietin (EPO).

Methods

This was a prospective, observational study. The baseline assessment was performed at a scheduled patient visit to the clinic during October-December 2010. All patients underwent clinical and laboratory monitoring for one year, and a re-evaluation was done in November- December 2011. Hospital admissions and their reasons were recorded, as well as the occurrence of cardiovascular events and mortality. Laboratory monitoring was based on GFR estimation using the abbreviated MDRD formula [9].

Laboratory tests were performed one week before patients attended the scheduled visits at the geriatrics and nephrology clinics both at baseline and at one year. The following parameters were measured in venous blood using standard hospital methods: creatinine, urea, uric acid, lipid profile, albumin, calcium, phosphorus, alkaline phosphatase, electrolytes, haemoglobin, urine dip-stick, and 24 -hour proteinuria(only for group 2).

Statistical analysis

SPSS 11.0 software was used for statistical analysis. Data are given as proportions, means, and standard deviations. A lineal model for repeated measures was used to assess change in kidney function over time. The significance level was 95%.

Results

Eleven patients (13.75%) died during the follow up, especially from group 2 (five from cardiovascular coplications, three due to impairment in overall status, two from fracture complications, and one from a malignancy). Hospital admission of 22.5% of patients was required during the year; 50% of these admissions were for cardiac disease, and 22.2% for infections. No significant differences in mortality, admission, and cardiovascular events were found between the groups.

As regards use of drugs, 27.5% were receiving statins, 77.5% antihypertensive drugs, 12.5% calcium salts, and 15% iron. No significant differences were found between the groups in use of these drugs. Only

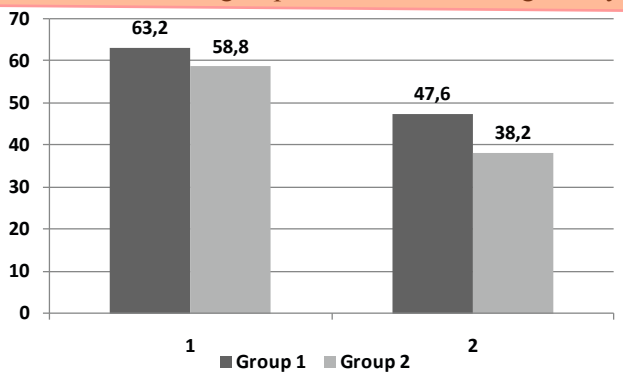

Figure 1 - GFR evolution in both groups (MDRD)

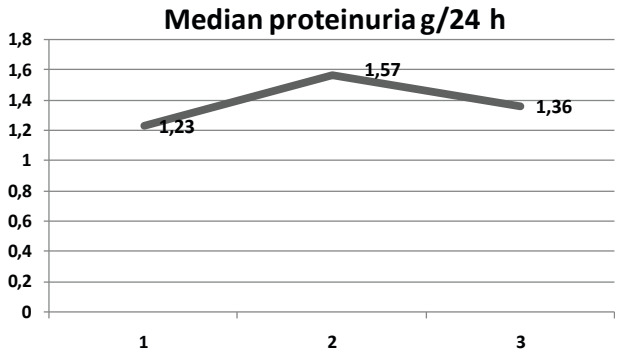

Figure 2 - Proteinuria evolution in Group 2

some group 2 patients (25%) were receiving EPO ($p < 0.003$). These were older patients (85 ± 5 yrs, vs 76 ± 6 years, $p < 0.001$) with higher SCr levels (2.4 ± 0.8 vs 1.3 ± 0.2 mg/dL; p 0.056) and lower eGFRs according to the MDRD formula (32 ± 10 vs 54 ± 15 mL/min; p 0.002).

Figure 1 shows the change in kidney function (GFR by MDRD) at one year in the 72 patients who completed the study.

In group 2, proteinuria showed no significant changes at one year: baseline, 1.14 ± 0.23 g/24 hours (range 0.6-3.5 g/24 h), vs 1 year, 1.23 ± 0.46 g/24 h (range 0.7-2.96 g/24 h), maybe due to proper antiproteinuric therapy (ACEI/ARB's).

Discussions

There are few studies reporting the progression of CKD in the elderly population. Hemmelgarm study [10] is describing CKD progression during two years of followup in a population > 66 years as a slow one, except in diabetic patients and in those with a GFR < 30 mL/min, in agreement with other studies [11,12] where association of estimated GFR to mortality, as well as progression to endstage CRF, was seen to be lower in the elderly population as compared to young patients.

With the current CKD classification, most patients diagnosed are elderly subjects [13]. However, only a small proportion of them will require renal replacement therapy, frequently dying before dialysis initiation, due to cardiovascular disease [14]. This study assessed the clinical and laboratory changes over one year in patients over 65 years of age with different grades of baseline GFR. A significant proportion of patients had cardiovascular risk factors (HBP and/or DM), and cardiac disease was the main morbidity cause among the studied groups(> 50%).

Aging is associated to a physiological decrease in GFR. Several recent studies found that despite the fact that almost all elderly patients studied had a decreased GFR (even with SCr within the normal laboratory ranges), no characteristic signs of CRF, or even urinary or morphological abnormalities were seen in most of them. Moreover, in the eldest population SCr showed higher statistical correlation levels with the laboratory changes associated to CRF than the GFRs estimated from mathematical formulas. Those studies concluded that GFR estimations provided no advantages over a simple SCr measurement for assessing kidney funcion in the elderly. Moreover, since part of the GFR decrease in these patients is associated to age and the main cause of mortality is cardiovascular disease, the current classification of CKD may induce unnecessary confusion and alarm and does not appear to have practical advantages for management of this type of patients [15].

In this study, we performed a clinical and laboratory followup to underline what was the GFR evolution in the elderly. It was seen that, though significant variations existed in GFR levels in both groups, when compared after one year of follow-up, differences were stastistically significant in group 2, with moderate CKD, in wich the GFR decrease was ~9 mL/min, in comparison with group 1, with GFR decrease of ~ 4.5 mL/min.

With GFR decrease, various laboratory changes associated to CRF occur (anaemia, changes in bone and mineral metabolism, metabolic acidosis, etc.). When the parameters associated to use of erythropoietin for anemia correction in these elderly patients were analysed, SCr levels > 2 mg/dL and advanced age were found to be the two factors that appear to contribute to the need for EPO therapy to prevent the occurrence of anaemia associated to CRF. It seems that, in standard clinical practice, CKD detection and management in elderly patients could