MP389

Estudio Pecera

PREVALENCE AND IMPACT OF HYPERKALEMIA IN PATIENTS WITH CKD 4-5 NOT ON DIALYSIS. DATA FROM PECERA STUDY

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INTRODUCTION

- Hyperkalemia is a common electrolytic abnormality in patients with CKD stage 4. In most cases, nephroprotective medications (RAAS blockers) may be discontinued, abrogating their potential cardio-renal benefits. Potassium binding resins are rarely used because poor tolerance and low compliance.

OBJECTIVE

- The aim of the study were: to analyze the prevalence of hyperkalemia, (K> 5.5 mEq/L), its relation to RAAS blockade, changes in RAAS blockade over time and its relation to hospitalizations and mortality in a cohort of CKD 4-5 not on dialysis patients from the PECERA study

PATIENTS & METHODS

- **PECERA** (**P**royecto de **E**studio **C**olaborativo en pacientes con **E**nfermedad **R**enal crónica **A**vanzada, Estadios K/DOQI 4 -5 no en diálisis) is a prospective, multicentre, observational study of patients with CKD stage 4-5 not on dialysis, who were followed-up for 3 years in the outpatient clinic.

- From May 2007 to March 2009 we included 1,022 consecutive patients seen in the outpatient clinics of 11 Nephrology centres from the Valencia Region. After exclusion of non-suitable patients the study consisted **of 995 patients** (806 CKD stage 4 – 81%-, and 189 stage 5 not on dialysis -19%-).

- INCLUSION CRITERIA:
  - Age> 18 year.
  - CKD stage 4-5 not on dialysis (eGFR < 30 ml/min/1.73 m^2) by MDRD equation.
  - Life expectancy >1 year
  - Patients must be able to give consent.
  - A systematic, consecutive sampling of patients was conducted during inclusion period until the desired number was reached.

- EXCLUSION CRITERIA :
  - Acute renal failure.
  - Wasting disease, malignancy, incapacitating disease, or active infection/inflammation.
  - Inability to give oral or witnessed informed consent

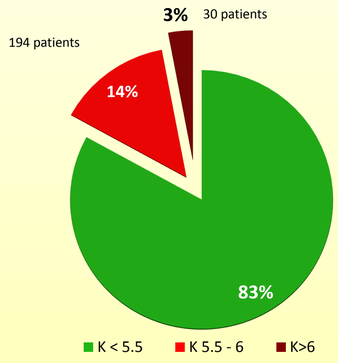
• Patients had potassium measurement at baseline, 6, 12, 18 , 24 and 36 months (in case they continued the follow-up). Mean follow-up 47 ± 30 months.

•The multivariate analysis was conducted by means of Cox proportional hazards model (death and hospitalization)

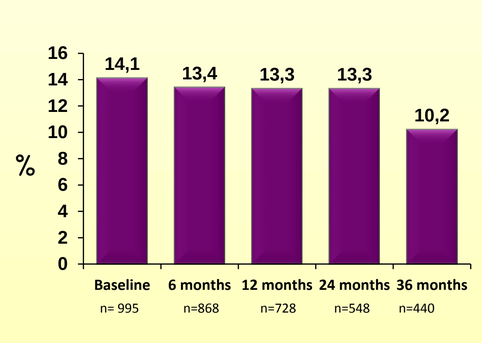
CHARACTERISTICS OF THE PATIENTS AT BASELINE (I)

N= 995 PATIENTS	n (%), x ± SD
Age, years (± SD)	69 ± 13 (r: 19-95)
Gendre (Male/ female)	60.2 % / 39.8 %
BMI, kg/m^2	28.2 ± 5.1 (16-52)
Diabetes	359 (35.4 %)
Stage (MDRD): - 4 K/DOKI (15-29 ml/min/1.73 m^2) - 5 K/DOQI (< 15 not on dialysis)	189 (19 %) 806 (81 %)
Etiology - Glomerular - Interstitial - Vascular - Polycystic renal disease - Diabetic nephropathy - Unknown - Other	 6.3 % 17.0 % 58.5 % 4.4 % 13.0 % 11.7 % 12.5 %
Congestive heart failure	20.1 %
Coronary heart disease	21.8 %
Cerebrovascular disease	13.3 %
Peripheral vascular disease	17.3 %
Current smoking	10.9 %
Former smoking	33.8 %
Serum creatinine, mg/dl	3.1 ± 1.1
eGFR (MDRD, ml/min/1.73 m^2)	20 ± 5
Proteinuria (gr/day)	1.4 ± 2.6
RAAS blackade	727 (73.1 %)
Systolic blood pressure, mmHg	132 ± 17
Diastolic blood pressure, mmHg	72 ± 9
Waist circumference, cm	100 ± 15

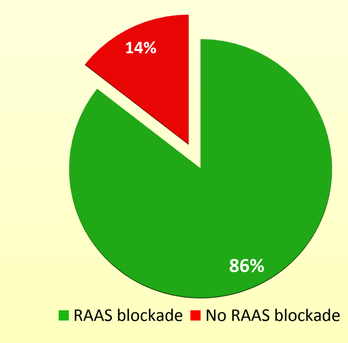
RESULTS



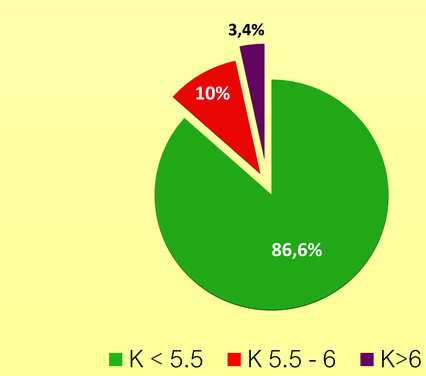
Prevalence of hyperkalemia at baseline
N= 995 patients



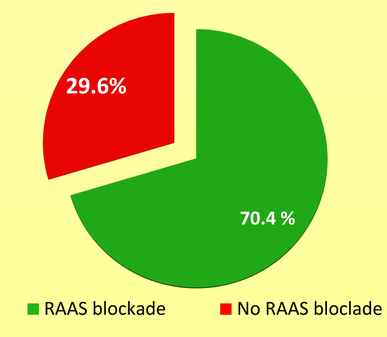
Prevalence of hyeprkalemia during the follow-up



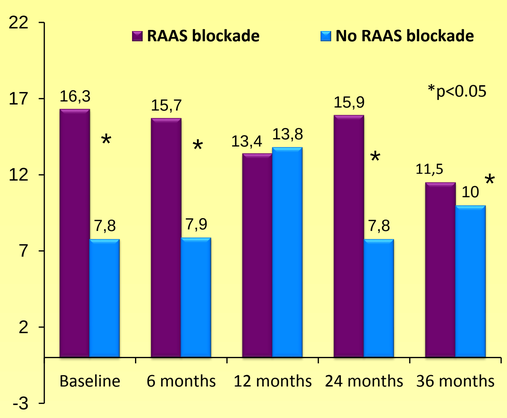
RAAS blockcade at baseline
N=995 patients



Hyperkalemia in 3,575 determinations during the study
N= 995 patients followed-up 47 ± 30 months

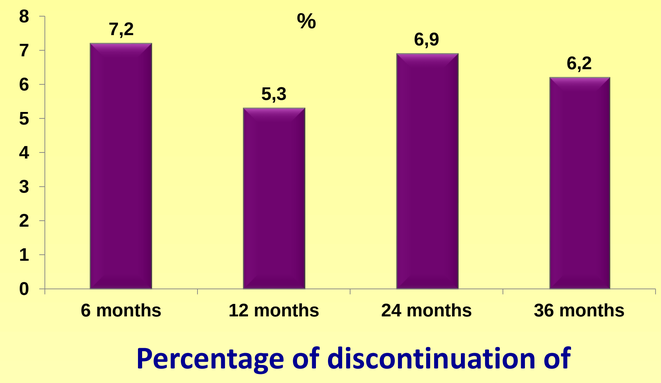


RAAS blockade in the patients during the follow-up (considering all visits)
N= 995 patients followed-up 47 ± 30 months



Prevalence of hyperkalemia depending on RAAS blockade during the follow-up

During follow-up, the blockade was discontinued in a total of 145 patients (14.5%).
Causes: hyperkalemia 33 %, deterioration of renal function 26 %, both 41 %



Percentage of discontinuation of RAAS blockade during the follow (in patients with RAAS blockade)

Risk factors for hospitalization
(Cox regression model adjusted by age)

Factor	HR	95% CI	*P*
Diabetes Mellitus	1.60	1.20 – 2.12	0.01
Previous congestive heart failure	2.12	1.53 – 2.95	0.001
Cardiovascular disease	1.42	1.15 – 2.15	0.01

The serum potassium was included as continuous and dicotomic variable (serum potassium> 5.5 mEq/L in more than one determination)
The analysis was repeated with serum potassium > 6 mEq/L in more than one determination (p = ns). (In case of baseline potassium as continuous variable, p = 0.07).

The presence of hyperkalemia was not an independent prognostic factor for the number of admissions

Risk for cardiovascular mortality
(Cox regression model adjusted by age)

Factor	OR	95% CI	*P*
Age	1.06	1.02 - 1.09	<0.001
Diabetes mellitus	1.77	1.09 – 3.20	0.045

The serum potassium level was included as continuous variable as well as and serum potassium level > 5.5 in more than one occasion.
The analysis was repeated with K> 6 on more than one determination (p = ns)

The presence of hyperkalemia was not an independent prognostic factor for mortality

CONCLUSIONS

- Hyperkalemia is a frequent complication in CKD stage 4-5 not on dialysis.
- One quarter of CKD patients stage 4 don't receive cardio and nephroprotective drugs.
- During the follow up more than 10 % per year of the patients withdraw RAAS blockade.
- The presence of hyperkalmia is associated to a discontinuation of drugs that can produce cardio-renal benefits.
- In our series, hyperkalemia (K>5.5) was not associated with either, an increase in hospitalizations nor an increase in mortality. This may be due to the close monitoring of the studied patients

Study sponsored by:
Fundación Renal Tomás de Osma · SV Nefrología · Sociedad Española de Nefrología · Roche · Abbott Renal Care · Boehringer Ingelheim

DOI: 10.3252/pso.eu.54ERA.2017
ePosters supported by F. Hoffmann- La Roche Ltd.
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