Proton Pump Inhibitor usage, hypomagnesemia and the risk of mortality in hemodialysis patients: a PSM cohort

Ángel LM de Francisco[1]; Rosa Ramos[2]; Javier Varas[2]; José Ignacio Merello[2]; Bernard Canaud[3]; Stefano Stuard[3]; Julio Pascual[4]; Pedro Aljama[5] on behalf of ORD group

1. Servicio de Nefrología H.U. Valdecilla Santander, Spain. 2. Dirección Médica, FMC, Madrid, Spain. 3. FMC. Bad Homburg, Germany. 4. Servicio de Nefrología, Hospital del Mar, Barcelona, Spain. 5. Servicio de Nefrologia H. U. Reina Sofía Córdoba, Spain.

Introduction

Long term inappropriate proton pump inhibitors use (PPIs) is a matter of concern, due to the risks associated with their long term use in chronic older patients. The risk of PPIs treatment in hemodialysis patients is unexplored.

Objectives

We assessed the relationship between the use of PPIs, hypomagnesemia and the risk of death in hemodialysis patients.

Methods

A retrospective multicentre propensity score–matched study to analyse the effect of PPIs on serum magnesium and mortality was designed. Information about demography, haemodialysis treatment, laboratory data and concomitant medication was obtained from the EuCliD® database (FMC). We studied 1776 haemodialysis patients under PPI therapy compared to 466 patients not receiving PPIs. Further resulting population formed by two groups of 410 matched patients was explored.

Results

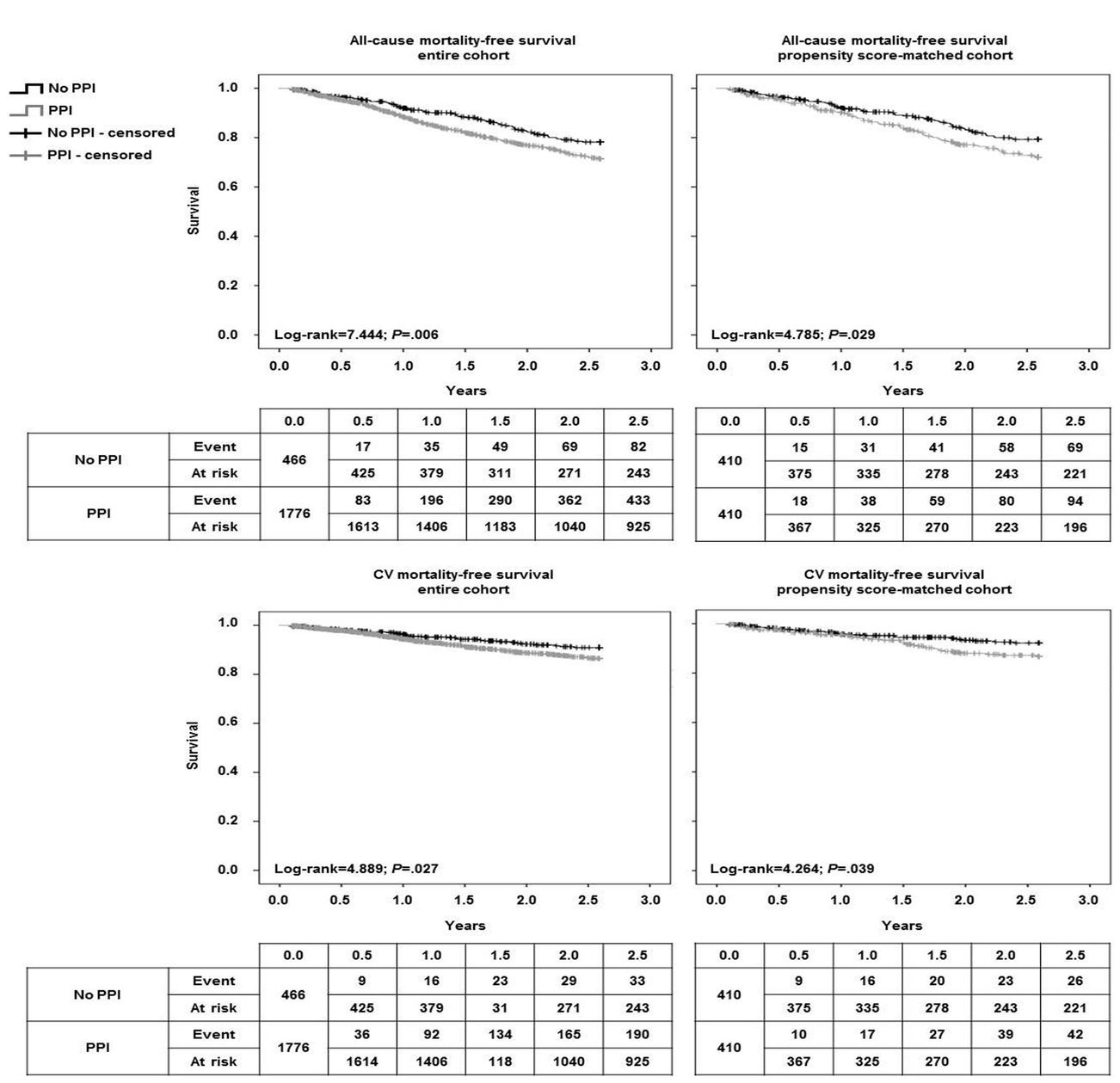
PPI use was associated with hypomagnesemia (Mg <1.8 mmol/L; OR= 2.70; 95% CI: 1.38-5.27; P=0.004).The exposure to PPIs in the full patient cohort, was identified as an independent predictor for all-cause mortality in both univariate (HR 3.16; 95% CI: 1.69–5.90, P<0.001) and multivariate (HR 2.70; 95% CI: 1.38–5.27 P=0.004) Cox regression models. Moreover was identified as a predictor of CV mortality (HR 1.51; 95% CI: 1.05-2.20; P=0.028) Of the 820 patients matched throughout the propensity score analysis, the hazard ratios for all-cause mortality (HR 1.412; 95% CI: 1.04–1.93, P=0.030) and CV mortality (HR 1.67; 95% CI: 1.03-2.71; P=0.041) were higher among patients taken PPIs versus those not on PPIs.

Conclusion

Use of PPIs was isolated as an independent predictor for hypomagnesemia, all-cause mortality and CV mortality in haemodialysis patients. PPIs treatment should be regularly monitored and prescribed only when indicated.

	No PPI (n=410)	PPI (n=410)	Std. Diff.		P after PSM
			Before	After	
Age (years)	70 (56–76)	68 (59–77)	0.65	0.09	0.89
Gender (female)	33.66%	38.05%	0.05	0.00	0.19
Dialysis vintage (months)	32.48 (17.18–70.75)	41.02 (21.1–76.35)	0.10	0.02	0.07
Diabetes mellitus	32.93%	36.10%	0.14	0.02	0.34
Charlson index (Exc. Age & DM)	2 (2–3)	2 (2–3)	0.06	0.03	0.32
Arteriovenous Fistula	74.63%	71.71%	0.05	0.04	0.35
OL-HDF	57.56%	56.34%	0.10	0.04	0.75
Kt/V	1.92 ± 0.38	1.92 ± 0.39	0.14	0.08	0.90
Effective treatment time (min)	245.79 ± 11.39	246.6 ± 11.76	0.09	0.03	0.32
SBP Pre-HD (mmHg)	134.98 ± 21.61	134.08 ± 22.51	0.03	0.01	0.56
Average Relative Overhydration	10.01 (4.78–14.42)	10.02 (4.09–14.81)	0.07	0.01	0.78
Albumin (g/l)	3.89 ± 0.35	3.85 ± 0.35	0.07	0.04	0.08
Hemoglobin (g/dl)	11.74 ± 1.36	11.75 ± 1.4	0.13	0.03	0.96
C-reactive protein (mg/l)	5.13 (1.9–12.95)	5.97 (2.11–12.25)	0.06	0.02	0.37
Magnesium (mg/dl)	2.41 ± 0.37	2.37 ± 0.42	0.08	0.03	0.19
Calcium (mg/dl)	9.04 ± 0.52	8.97 ± 0.54	0.32	0.02	0.07
VitD (mg/dl)	15.7 (10.98–24)	15.35 (10–25.28)	0.07	0.05	0.75
Sintrom® or Warfarin	8.05%	9.51%	0.03	0.01	0.46
Clopidogrel or Acetylsalicylic Ac.	37.32%	42.68%	0.12	0.02	0.12
Corticosteroids	3.41%	3.66%	0.34	0.06	0.85

Baseline Characteristics in the Propensity-matched Cohort (n=820).



		0.0	0.5	1.0	1.5	2.0	2.5
No PPI	Event	466	17	35	49	69	82
	At risk		425	379	311	271	243
PPI	Event	1776	83	196	290	362	433
	At risk		1613	1406	1183	1040	925

		0.0	0.5	1.0	1.5	2.0	2.5
410			15	31	41	58	69
			375	335	278	243	221
410			18	38	59	80	94
			367	325	270	223	196

		0.0	0.5	1.0	1.5	2.0	2.5	3.0
No PPI	Event	466	9	16	23	29	33	
	At risk		425	379	31	271	243	
PPI	Event	1776	36	92	134	165	190	
	At risk		1614	1406	118	1040	925	

		0.0	0.5	1.0	1.5	2.0	2.5	3.0
410			9	16	20	23	26	
			375	335	278	243	221	
410			10	17	27	39	42	
			367	325	270	223	196	

Kaplan–Meier survival plots for all-cause mortality (upper panels) and cardiovascular (CV) mortality (lower panels) in the entire population (left panels) and after the propensity score matching adjustment (right panels)

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54th ERA-EDTA Congress Madrid (Spain), June 3-6, 2017

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Dialysis - Epidemiology & outcome I

Ángel Martín de Francisco

DOI: 10.3252/pso.eu.54ERA.2017

ePosters supported by F. Hoffmann- La Roche Ltd.