

Predictors of changes in pre-dialysis systolic blood pressure in an international cohort of hemodialysis patients

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Background

Prior studies indicated that hemodialysis (HD) patients from the US experience an increase in pre-dialysis systolic blood pressure (preSBP) in the first year of dialysis. In contrast, preSBP declines in HD patients from Europe, Latin America, and Asia Pacific in the same term¹. In this study we aimed to explore in detail factors associated with changes in preSBP in a large international sample of incident HD patients.

Methods

The MONitoring Dialysis Outcomes (MONDO) consortium consists of HD databases from Renal Research Institute (RRI) clinics in the US; Fresenius Medical Care (FMC) clinics in Europe, Asia Pacific (AP) and Latin America (LA); KfH clinics in Germany; Imperial College, London, UK; Hadassah Medical Center, Jerusalem, Israel; and University of Maastricht, The Netherlands².

Databases from RRI, FMC AP (Taiwan, Singapore, Hong Kong, and South Korea), and FMC LA (Argentina) were queried to identify all incident HD patients who had their first in-center HD treatment between 1/2000 and 12/2010 and survived at least 2 years on HD.

We employed simple linear regression to compute per-patient changes (slopes) of preSBP, post-dialysis weight, weekly erythropoietin (EPO) dose, and serum sodium between months 12 and 24 from the start of HD. For each variable, "Decline" was defined as a significant negative slope ($p < 0.05$) and "Increase" was defined as positive slope ($p < 0.05$). Patients with non-significant slopes ($p \geq 0.05$) were considered "Stable."

¹Guinsburg A, ERA-EDTA 2011

²Usvyat L, Blood Purif 2013;35:37-48

Results

We studied 6,383 patients (FMC AP n=1,483; FMC LA n=625; RRI n=4,275). Overall, 21% of the patients experienced an increase in preSBP, with the highest frequency of both increase and decrease being observed in RRI patients (26% and 25%, respectively; Table 1)

	Decline	Stable	Increase	Total
Asia Pacif (N=1483)	7%	85%	7%	1483
Latinamerica (N=625)	12%	70%	18%	625
RRI (N=4275)	25%	49%	26%	4275
Total (N=6383)	20%	60%	21%	6383

Table 1

There was no notable difference in changes in preSBP between patients with declining, increasing, or stable post-dialysis weight slopes.

In all regions studied, there was a trend for an **increase in preSBP** associated with an increase in EPO dose ($p < 0.05$ for RRI, figure 1) and an increase in serum sodium ($p < 0.05$ for RRI, figure 2).

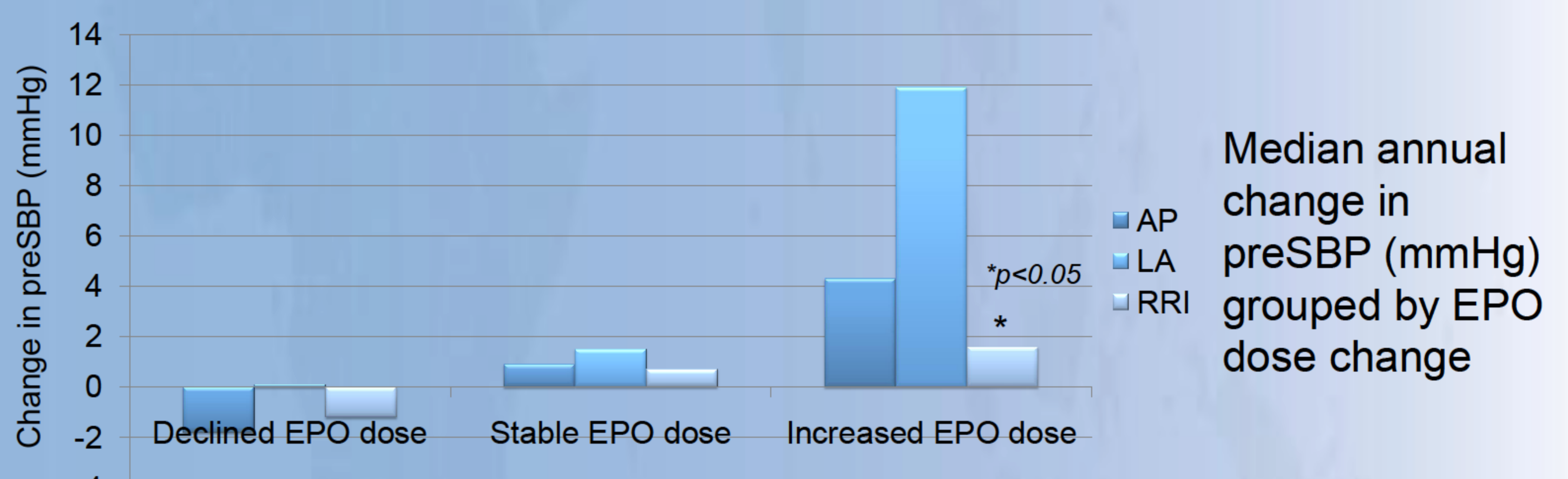


Figure 1

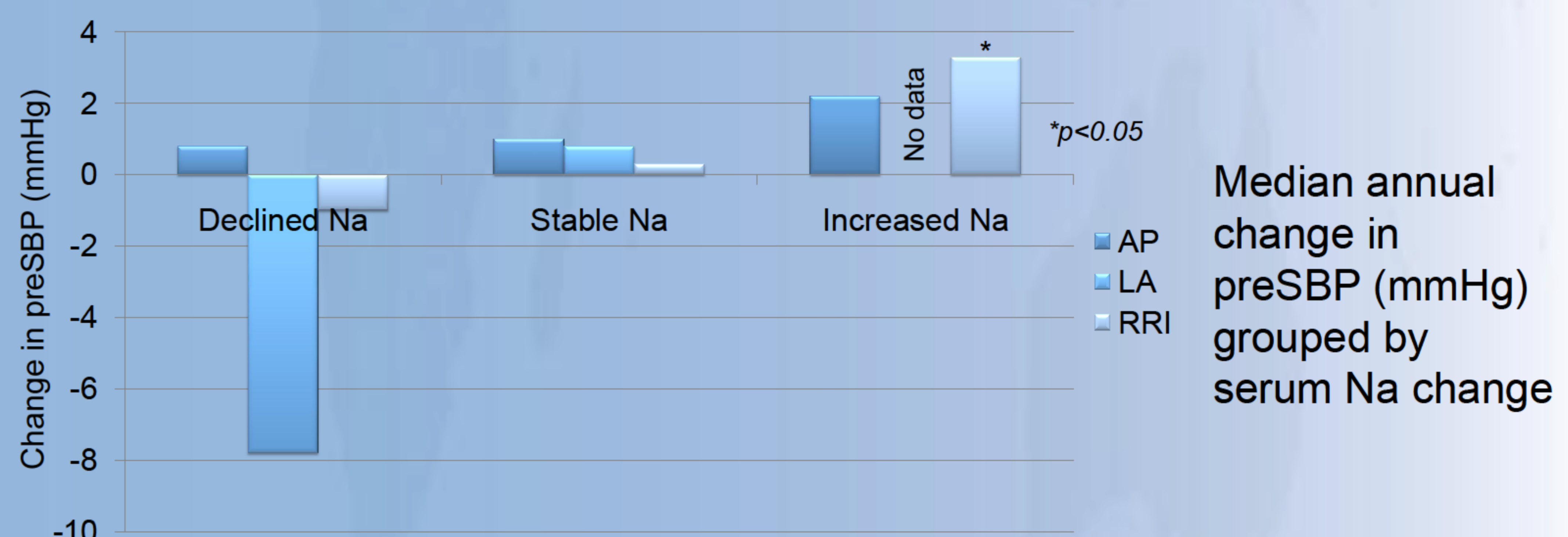


Figure 2

Conclusion

Our multi-national study indicates the existence of a trend towards preSBP increase in the second year on HD in the presence of EPO dose increase. In addition, an increase in serum sodium is also associated with an increase in preSBP.

We found no clear relationship between changes in body weight and preSBP. Further analyses of the interaction between the observed effects on preSBP and antihypertensive therapy are needed.

