Background

In hemodialysis (HD) patients treated in a single facility, we found that blood pressure (BP) before dialysis sessions was associated with seasons and outdoor temperature. We wanted to extend the study of BP to other facilities in Europe and to assess the effect of geographical influences on both BP level and seasonality.

Methods

Clinical data were obtained from the Dialysis Outcomes and Practice Patterns Study (DOPPS) phases 3-4 (2005-2011) for patients from European countries. For each phase, patients were randomly sampled from national samples of HD facilities. Every four months, BP was measured immediately before and after the dialysis session according to usual clinical practices, and repeated measures. A latitude of 50° was set as the reference. Temperature recordings from meteorological stations corresponding to HD facilities were obtained (Figure 1). Geographical exposure of patients was defined as the country of treatment or the latitude of meteorological stations. Seasons were defined by month: Winter (December, January, February), Spring (March, April, May), Summer (June, July, August), Autumn (September, October, November).

Results

Geographical Patterns of BP

There were significant differences in pre- and post-dialysis BP across Europe (Table, P < 0.001). Pre- and post-dialysis BPs were significantly lower in southern places (Figure 2-left, P int = 0.04), with an additional 0.8 [0.1 ; 1.5] mmHg for each 10-degree decrease in latitude. The effect of temperature on pre-dialysis SBP was also more pronounced in September (−5.1 [−3.7 ; −6.5] mmHg vs −2.9 [−5.9 ; −0.0]) and post-dialysis SBP of 1.7 [0.8 ; 2.6] and 1.0 [0.2 ; 1.9] mmHg.

Geographical and Seasonal Patterns of Blood Pressure in Hemodialysis Patients: a EURODOPPS Study

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