

Abstract No. : A278

Theme : Rehabilitation, Quality of Life and Survival

Mobile Online Telemonitoring (MOT) in Pediatric Dialysis Patients

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Control of the hydration state is a major challenge in managing ambulatory dialysis. Telemonitoring may be helpful to maintain patients in fluid balance. We have assessed the usefulness of a novel telecommunication technology that permits continuous ambulatory monitoring of blood pressure (BP), heart rate and body weight. Digital scales and oscillometric semi-automated BP devices equipped with bluetooth transponders transmit measurements to a mobile phone, which automatically forwards the data to an internet server. The data can be viewed in tabular and graphic format on a website within seconds of measurement. MOT was performed for two- to five-week periods in nine APD, four in-center HD and one home HD patient aged 6 to 18 years. Heart rate, systolic and diastolic BP and body weight varied at mean intraindividual SDs of 11 min^{-1} (12.5%), 11 (9%) and 8.4 mm Hg (10.9%) and 0.9 kg (2.4%), respectively. Maximal variations averaged 50 mm Hg for systolic BP and 3.4 kg for weight. In several instances significant shifts of BP or weight over time occurred in patients on APD, resulting in modifications of dialysis prescription between the regular outpatient visits. In the HD patients the time course of interdialytic weight gain and BP was visualized, facilitating the definition of dry weight and BP control. In one patient a hypotensive episode following inappropriate post-dialytic administration of nifedipine was recorded. MOT was well accepted by all families, and perceived as a major relief from the responsibility for home dialysis therapy. MOT is an innovative, economical telemedicine concept utilizing standard bluetooth, mobile phone and internet technology. While telemonitoring of BP and body weight is already realized, the planned integration of additional medical devices such as PD cyclers and pill dispensers will provide complete online surveillance of home dialysis treatment at minimal effort to patients and medical teams.