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Assessment of dialysis adequacy by ultraviolet absorbance: comparison to standard method of urea removal

Heo jung YOON, Seok hui KANG, Kyung rim RYU, Kyu hyang CHO, Jong won PARK, *Jun young DO

Internal Medicine, Yeungnam University Hospital, Korea,South

Objectives : Measurement of dialysis adequacy would be desirable, if it could be achieved without blood sample. There have been technical improvements in the online monitoring of conductivity during hemodialysis. The aim of this study is to assess the agreement between Kt/VBlood calculated with Daugirdas formula (KtVBlood) and Kt/V measured by ultraviolet absorbance (Kt/VAdimea).

Methods : 22 hemodialysis were prospectively evaluated in 22 chronic hemodialysis patients. Kt/VAdimea was measured by the dialysis machine (Dialog+, B Braun Avitum AG). Kt/VBlood was calculated by urea kinetic modeling based on the pre- and post-dialysis blood urea nitrogen levels.

Results : The mean age was 55.2 ± 13.6 years. Males were slightly predominant (59.1%). 13 patients had diabetes mellitus (59.1%). Mean KtVBlood and Kt/VAdimea were 1.47 ± 0.26 and 1.40 ± 0.24, respectively ($P = 0.118$). The correlation coefficient was 0.761 ($P < 0.001$). The intraclass correlation coefficient was 0.862 ($P < 0.001$). There were significant correlations and intraclass correlations between the two methods. Bland-altman analysis was also performed. There was a negative bias for Kt/VAdimea (mean difference = −0.06045, 95% CI; −0.4015 ~ 0.2806). There was a small bias between the two methods.

Conclusions : There were no significant differences in dialysis adequacy between the two methods. Kt/V using ultraviolet absorbance may be applicable to measure dialysis adequacy in hemodialysis patients.

Keywords : dialysis, adequacy, ultraviolet absorbance