IS ONLINE CONDUCTIVITY MONITORING OF DIALYSIS ADEQUACY BETTER THAN CALCULATED DIALYSIS DOSE BASED ON UREA CLEARANCE

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INTRODUCTION & AIMS

Adequate delivered dose of solute removal (as assessed by urea reduction and calculation of Kt/V) is an important determinant of clinical outcome in chronic haemodialysis (HD) patients (1). This requires both prescription of an adequate dose of HD and regular assessment that the delivered treatments are also adequate, that at least a monthly control of dialysis dose should be performed using blood samples. However, Intra-patient variations occur in dialysis adequacy (2). On line conductivity monitoring Kt/V OCM online clearance measurement (OCM -using sodium flux as a surrogate for urea- allows the repeated non-invasive measurement of Kt/V on each HD treatment (3).

Our aim was to compare single pool Kt/V (SKt/V) results obtained from second generation Daugirdas's formula with on line conductivity monitoring of Kt/V.

METHODS

We prospectively studied 192 (68 female) established chronic HD patients over 4 months period, 99% of the patients were on high flux dialyzer and were undergoing online haemodifilteration, 75% were dialyzing via arteriovenous fistula with mean blood flow rate of 375 ml/min (range 250-430 ml/min), all on auto dialysate flow with a factor of 1.5 of the blood flow. A pre and post dialyzer measurement of the conductivity is performed by two mutually independent temperature-compensated conductivity cells equipped with Fresenius 5008 dialysis machines. Urea reduction was measured (once a month) by a single pool calculation using immediate post treatment sampling. Values of calculated Kt/V (conventional method with second generation Daugirdas' formula (Kt/V D) and simultaneously obtained online Kt/V OCM were compared. All data were analyzed using the statistical package for social science (SPSS) for Windows software (v20; SPSS Inc, Chicago, IL, USA).

RESULTS

There was a statistically significant difference between calculated Kt/V DAU and Kt/V OCM over the study period. The mean calculated Kt/V DAU was 1.82 ± 0.30, and mean OCM was 1.53 ± 0.26 (p = 0.000) (figure 1). However, there was significant correlation between calculated Kt/V DAU and Kt/V OCM (r2 = 0.618) (p = 0.000) (figure 2).

Figure 1. The difference between online Kt/V & calculated Kt/V as measured by urea reduction

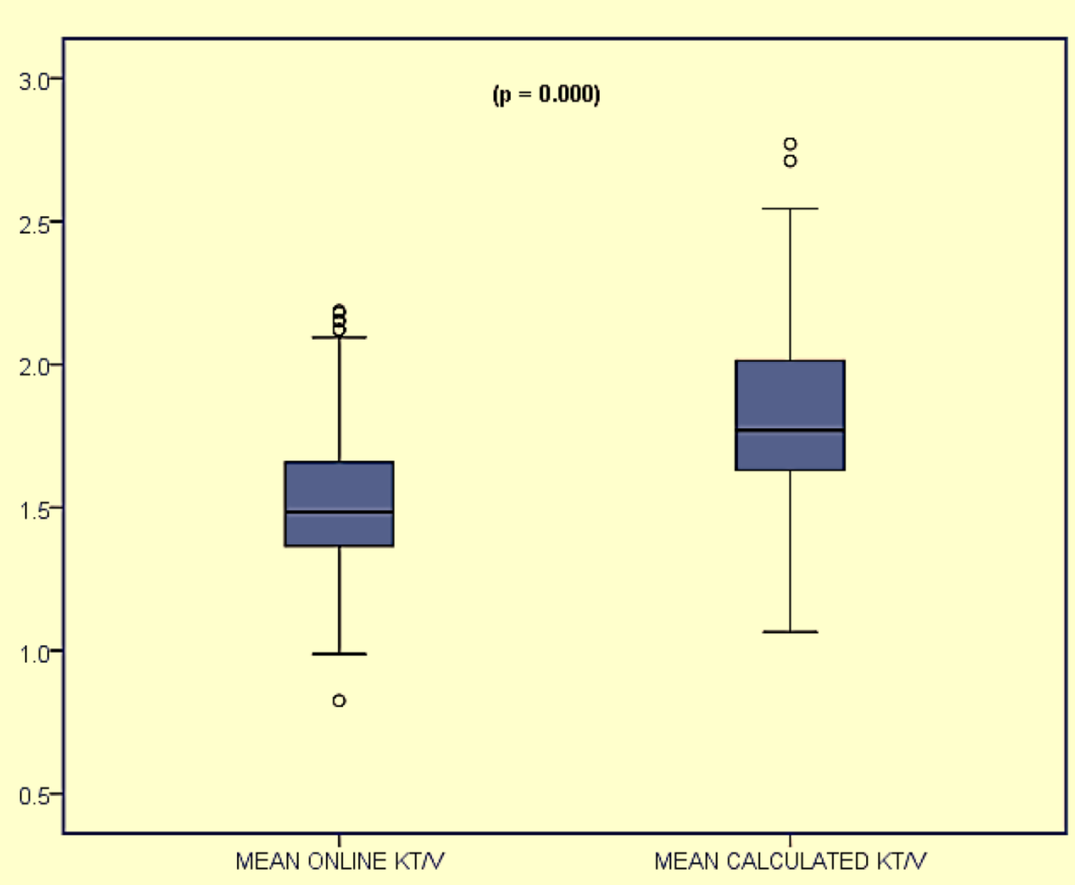
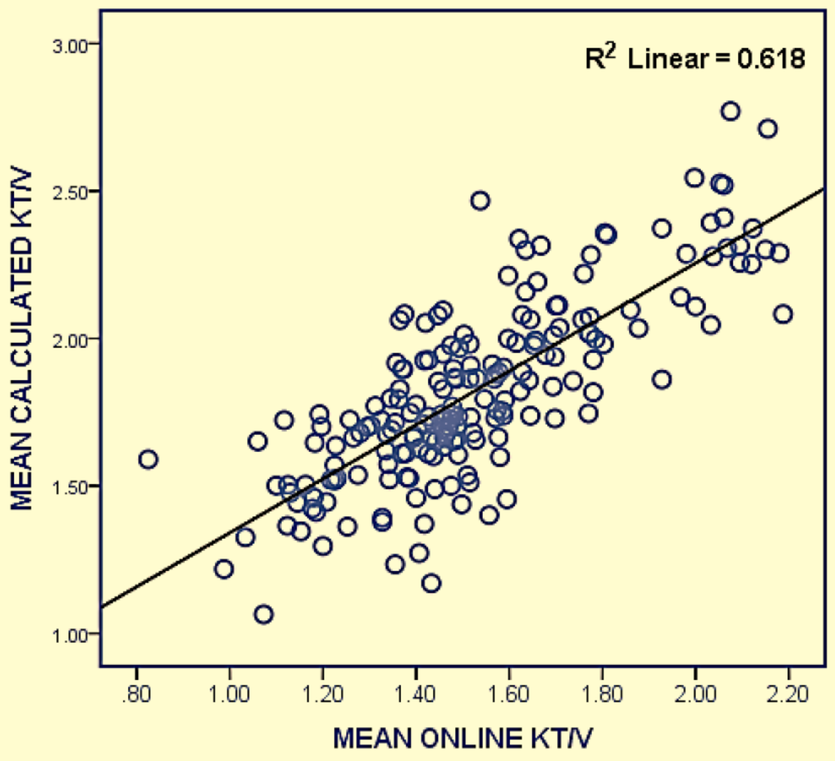


Figure 2. Correlation between online Kt/V and calculated Kt/V as measured by urea reduction



CONCLUSIONS

Calculated Kt/V D values overestimate dialysis efficiency (this may be due to fact that in this study we used Single pool Kt/v which overestimate dialysis efficiency compared with equilibrated Kt/V). Nevertheless the close correlation between the two parameters makes it easy to derive effective urea clearance from ionic dialysance. Since it is reasonable to assume that urea distribution volume is constant in steady-state patients, once this has been exactly determined by means of the measurement of ionic dialysance, it is possible to calculate Kt/V on-line at each session without the need for any blood sampling or laboratory examinations, and at no additional cost.

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M) Dialysis. M1) Extracorporeal dialysis: techniques and adequacy.

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