

Kt/V


URR based Kt/V

Daugirdas Kt/V:

- Is the most widely used method for calculating Kt/V
- For this method we need the following's
 - Pre and post HD blood samples for urea level measurement
 - Duration of treatment
 - Ultrafiltration volume
 - Post HD weight

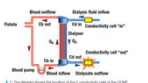
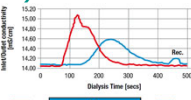
Daugirdas natural logarithm Single pool formula

$$Kt/V = -\ln (R - 0.008 \times t) + (4-3.5 \times R) \times Uf/W$$



Online clearance monitoring (OCM_o)


- OCM in F5008 Cordax is based on the sodium ion diffusion.
- It is an indirect determination of urea clearance.
- At 37 °C, diffusion coefficient of Na⁺ : 1.94 x 10⁻⁶cm²/s, Urea : 2.20 x 10⁻⁶cm²/s)
- OCM using dynamic CD-pulses and measuring the changes in conductivity before and after the dialyzer.
- The ionic distance converted into the effective urea clearance using clinically validated algorithms


Sidra Medicine

Abstract

Aim



Pediatric hemodialysis patients




Kt/V OCM vs Lab

Subjects and Methods:

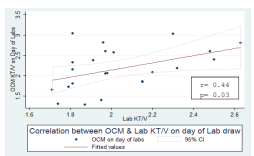
- This is a 6 month retrospective study
- Sidra Medicine pediatric dialysis unit (Doha, Qatar)
- Patient's age range : 4 to 12 years
- Dry weight : 11 to 22kg
- Treatment : Online Hemodiafiltration (HDF)
- No Of Treatments Included : 342
- Equipment : S008 cordax FMC
- Volume Urea measurement : Bio-impedance using Fresenius body composition monitor (BCM)

> Monthly calculated Kt/V (Daugirdas) was compared to:

- 1) OCM measured Kt/V on the same day of monthly Labs
- 2) OCM Kt/V average for the month
- 3) OCM Kt/V average for the week before and after lab Kt/V .



Results




Correlation between OCM & Lab Kt/V on day of Lab draw

- OCM on day of lab
- Fitted values

$r = 0.44$
 $p = 0.03$


- OCM Kt/V measured on day of monthly labs significantly correlated with the calculated Lab Kt/V. Correlation co-efficient = 0.44, P value 0.03



Results

- We noticed that the OCM over-estimated the Kt/V in small children, that was due to inaccuracy of BCM in determining the V urea in small children.
- We re-tested the Kt/V correlation (Lab and OCM) for children with body weight only of > 15 Kg.
- By excluding children < 15 kg, the correlation between Kt/V (Lab and OCM) became stronger with a correlation co-efficient = 0.78, P value <0.01

	OCM Kt/V
Lab Kt/V	r = 0.44
all ages	p = 0.03
Lab Kt/V	r = 0.78
>15 kg p < 0.01	p < 0.01




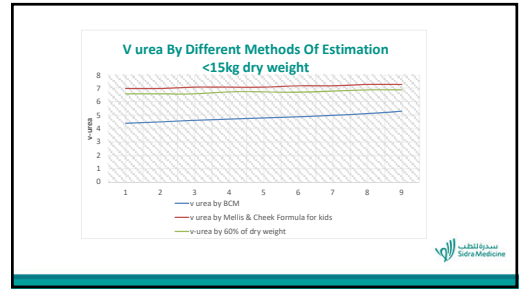
Then we asked the question: Does including more OCM measurements improve the correlation with the Lab measured Kt/V?

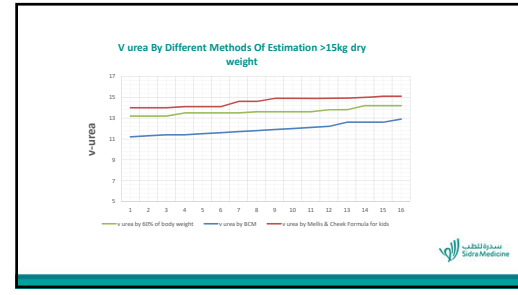
	OCM Kt/V	OCM average monthly Kt/V	OCM biweekly Kt/V
Lab Kt/V n=101	r=0.44 p<0.01	r=0.4 p<0.05	r=0.4 p<0.05

- Average of monthly measured OCM Kt/V did not improve the correlation with Lab Kt/V, r remained 0.4
- The same was true when we looked at the average OCM Kt/Vs for the week before and the week after the Lab Kt/V

The answer was: No!








Conclusion:

- OCM Kt/V provides real-time, reliable, non-invasive assessment of dialysis adequacy in children.
- OCM Kt/V correlated better with Lab Kt/V when the patient weight was >15 kg (this may be related to the accuracy of BCM in assessing V-urea in small children.)
- Larger studies are needed to validate the use of different OCM technologies in children on dialysis before adopting them as an alternative to Lab Kt/V.



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Thank you Contact : anatarajan@Sidra.org