Comment on the Letter to the Editor by C. Basile

Urea Distribution Volume Is Practically Constant in Hemodialysis Patients

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In the current issue of the Journal, Basile [1] reports his findings regarding urea distribution volume (V) in patients on chronic hemodialysis. He points out two discrepancies with results previously reported by us [2].

The urea distribution volume is similar to that of body water [3-5]. It is known that body water ranges from 35 to 75% of body weight, depending on individual variants (sex, adipose tissue content, hydration condition or body surface area) [6-8]. Accordingly, V is relatively constant for every patient and it does not change from dialysis to dialysis. This may not be the case during dialysis sessions.

We observed that the V value gradually increased throughout the dialysis [2]. In the first hour, the mean V was 42.18 ± 6.98% of body weight, in the second hour it was 50.78 ± 7.48%, and at the end of the dialysis session it was 55.68 ± 7.88%. These findings suggest that the transcellular urea transport is lower than the dialytic clearance and support a role for a two-pool urea kinetic model. In a 3-hour hemodialysis period, the V value ranged from 43 to 72% of body weight (mean 55.68 ± 7.87%). Nevertheless, this V value was similar in 6 determinations for the same patient.

The difference in V and the high range of V values reported by Basile [1] – in 7 of 12 patients the V value changed more than 20% of body weight – may be explained by methodological aspects. For instance, dialysis time was varied and it ranged between 90 and 270 min. Careful attention to the blood and dialysate sampling technique is critical. In our study, like others [9, 10], postdialysis blood sampling was obtained after decreasing the blood pump rate to 50 ml/min and waiting for 30-60 s to prevent access recirculation. Also, to prevent infection by microorganisms which decrease urea we have added a sterile agent (2 ml of bleach) in the graduated tank in each experiment.

Finally, we cannot forget that considering the urea rebound effect as an expression of intercompartmental reequilibrium [11], the V value would be slightly higher than the one calculated. Recent studies in our hospital support the hypothesis that, once the reequilibrium has been achieved, the urea distribution volume is a constant parameter [12].

In conclusion, the V value is a practically constant parameter, it has an individual variability and it may range from 35 to 75% of body weight. The gradual increase in the V value throughout the dialysis time is not real, and it suggests a bi- or multicompartimental model.
Any error in the calculation of the V value can be corrected if urea rebound is taken into consideration and final urea is obtained 45 min after dialysis [12].

References

Basile C: Urea distribution volume is not constant in hemodialysis patients. Nephron 1995; 70:133-134.


