

CITRATE DIALYSATE DECREASES ALUMINUM BURDEN IN HEMODIALYSIS (HD) PATIENTS

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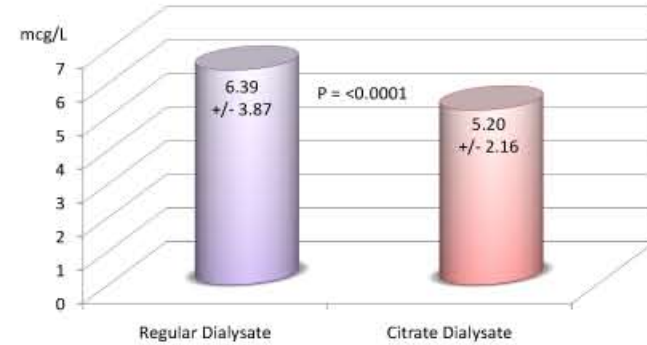
BACKGROUND:

- Aluminum (Al) accumulation in dialysis patients causes significant morbidity and mortality.
- Its dialytic removal is very limited, and the only practical treatment has been the use of desferoxamine (DFO).
- DFO carries significant risk and has limited efficacy.
- Citrate is known to have high affinity for Al, forming a water-soluble compound.
- We propose that the citrate dialysate (CD) containing 2.4 mEq/L citrate will increase dialytic removal of Al, thus reducing the plasma concentration.

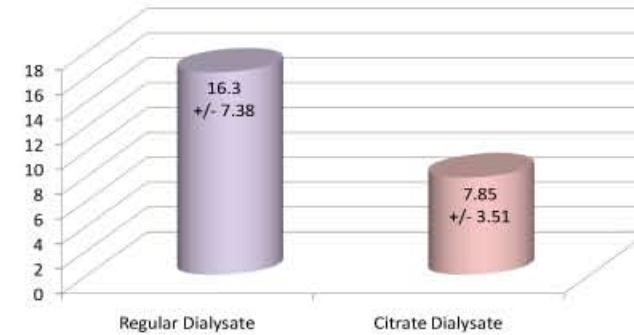
PATIENTS & METHODS:

- 142 chronic HD patients dialyzing 3 times a week consented to participate in the study.
- All patients had pre-dialysis Al concentration measured three times over a six month period on regular (non citrate) bicarbonate dialysate.
- All patients were switched to CD without changing any other treatment parameters.
- During the six months of CD the pre-dialysis plasma Al levels were also checked three times (First sample after one month on CD).

Six Month Average Serum Aluminum Levels with Regular and Citrate Dialysate



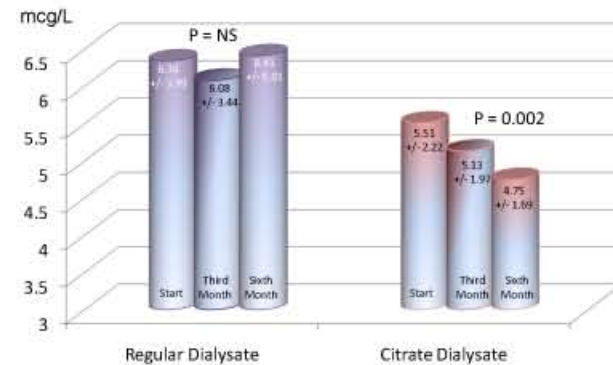
Six Month Average Serum Al Decline In Patients (N = 8) With Baseline Al Levels > 10.0 mcg/L



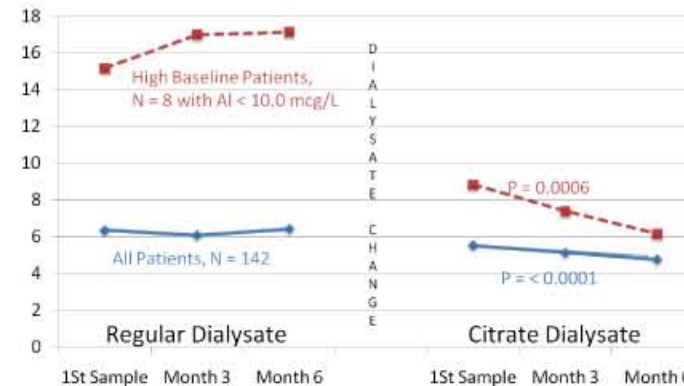
RESULTS:

- Pre-dialysis serum Al levels at baseline were not elevated in most patients. The average values were 6.39 ± 3.87 mcg/L (mean \pm SD).
- During the six months of CD the average levels decreased significantly to 5.20 ± 2.16 ($p < 0.0001$).
- During the six months on CD the serum concentration continued to decline while during the regular dialysate the serum concentrations did not vary significantly.
- In 8 patients the Al levels at the baseline were >10 mcg/L; in these patients the significant decline in the Al level with CD was more pronounced.
- In the above sub-group the Al declined from 16.13 ± 7.38 to 7.85 ± 3.51 mcg/L ($p < 0.0007$).
- All CD treatments were well tolerated without any reported events.

Serum Aluminum Measurements With Regular and Citrate Dialysate



Serum AL Trends with Regular and Citrate Dialysate



SUMMARY & CONCLUSIONS:

- CD over a six month period showed continuous decline from baseline in pre-dialysis serum Al levels in 142 chronic HD patients.
- This decline was more pronounced in those patients who had higher baseline Al levels
- It is proposed that high affinity between Al and citrate caused formation of aluminum citrate that is small in size and is highly water soluble, thus more readily dialyzable.
- The increased dialytic removal may be responsible for this decline.
- Future studies are needed to further define this observation.