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Title: Fifty-five Percent Heparin Reduction is Safe with Citrate Dialysate in Chronic Dialysis Patients

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Citrate containing dialysate (CD) has been reported to have anticoagulation effect (Tu et

al, D T, 29:620, 2000). Systemic heparinization during hemodialysis (HD) is associated with multiple risks including bleeding complications. The purpose of the study was to determine whether heparin can be safely reduced in chronic HD patients using CD. Thirty-one patients from 3 New Mexico FMC dialysis units were identified as having prolonged (>15 minutes) bleeding from needle sites at the end of dialysis when using regular dialysate. These patients were switched to CD and 2 months later their

heparin dose was reduced from an average of 4758 ± 2179 (mean \pm SD) units to 3165 ± 1352 units, a 33.5% reduction for a 2 month period (1st reduction). After 2 months the heparin dose was further reduced to 2158 ± 1362 units, another 32% reduction (2nd reduction), a total 55% reduction from the baseline. After the 2nd reduction patients were followed for another 3 months. Single use dialyzers (Optiflux NR160 or NR180) were used and the duration of dialysis, blood and dialysate flow remained unchanged.

After switching the patients to CD and reducing their heparin dose, prolonged bleeding reduced with no reported instances of bleeding.

Throughout the heparin reduction periods the dialyzer and blood tubing remained free of clots. After a total 55% reduction in heparin the Kt/V did not decrease, in fact it increased, as shown in the Table.

Despite a 55% reduction in heparin pre-dialysis Beta-2 microglobulin levels were lower during the CD, Pre CD 26.1 Vs 2nd reduction 24.0, p=0.08.

The use of citrate dialysate along with a 55% reduction in heparin was successful in decreasing the episodes of prolonged bleeding, was not associated with clotting of the system and an adequate dose of dialysis was maintained.

Kt/V values, mean (SD), during regular and citrate dialysate before and during heparin reductions

Pre CD
Baseline CD
1st Reduction
2nd Reduction

1.51 (0.21)
1.55 (0.18)
1.59 (0.18)
1.60 (0.16)*

*p=0.05 Pre CD Vs 2nd Reduction

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