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Title: HEPARIN REDUCTION WITH CITRATE DIALYSATE

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INTRODUCTION AND AIMS: Systemic heparinization during hemodialysis (HD) is associated with significant clinical problems. Some patients despite receiving relatively small dose of heparin have constant oozing around the needles during the treatment and/or continue to bleed for a long time after the needles are removed. Citrate containing bicarbonate dialysate (Citrasate®, Advanced Renal Technologies, Bellevue, WA, USA) has been reported to have some anticoagulation properties. Regular bicarbonate dialysate contains acetic acid as acidifying agent (AD) whereas Citrasate contains citric acid with known anticoagulant properties. The Aim of the study was to determine whether the use of citrate dialysate (CD) would permit a 30% reduction in heparin dose without increasing the risk of clotting of the dialyzer and dialysis set up and a decrease in the dialysis dose.

METHODS: Twenty chronic HD patients (11 females) from Fresenius Medical Care Santa Fe Dialysis Center, Santa Fe, NM, USA were identified to have excessive bleeding problems. These patients took more than 15 minutes to stop bleeding after the needles were removed and two patients also developed sub-conjunctival hemorrhage in addition to prolonged bleeding. They were switched from AD to CD and their heparin dose was reduced by an average of 30%. The AD contained either 4 mEq/l acetate (19 patients) or 8 mEq/l acetate (1 patient). CD contains 2.4 mEq/l citrate and 0.3 mEq/l acetate. The clotting assessed by the examination of the dialyzer and the set up. The dialyzer clotting was further measured by the urea reduction during the treatment and is expressed as Kt/V_{urea}. The data for two months on AD is compared with data for two months on CD.

RESULTS: The reduction in the heparin dose averaged 30% from 4275 ± 1758 (mean \pm SD) during AD to 2970 ± 1322 units/treatment during CD. No clotting of dialysis set up was noted on reduced heparin and CD treatments. The Kt/V for the two months on AD and usual heparin were $1.61 \pm .15$ and $1.62 \pm .15$, this remained unchanged during the two months on 30% less heparin on CD, $1.62 \pm .19$ and $1.59 \pm .17$, all p values ns. With a 30% reduction in the heparin dose bleeding episodes decreased.

CONCLUSIONS: The use of CD permitted a significant reduction in heparin without any increase in clotting during the treatment, and without any decrease in the dose of dialysis as determined by Kt/V_{urea}. Based on these results a larger reduction in heparin dose will be studied.

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