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The Effect of Citrate Dialysate on Intradialytic Heparin Consumption for Heparin-dependent Haemodialysis Patients: A Paired Pilot Study

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Case Study : Introduction Unfractionated heparin is commonly use in haemodialysis (HD). However, its use is associated with potential side effects. Citrate dialysate (CD) impaired the clotting process within the dialyzer and hence has the potential to reduce the anticoagulation requirement during haemodialysis. This study is to evaluate the possibility of reducing Heparin requirement in HD patients using CD and their dialysis treatment outcomes. Methodology HD patients using high dose heparin for anticoagulation were recruited. Each patient would receive 10 HD sessions using conventional bicarbonate dialysate followed by 10 sessions using CD (SelectBag Citrate, citrate level of 3mEq/L). Dosage of heparin would be adjusted under study protocol based on a standardized 0-4 visual clotting scale. Total heparin consumption (THC) and HD parameters: Transmembrane Pressure (TMP), Target Therapeutic Fluid Volume Eliminated (TVFE), Blood Flow Rate (BFR) and KT/V measured by Diascan (OCM) and pre, post-dialysis serum biochemistry of each HD session would be collected. Hemodynamic stability, time to achieve haemostasis and HD bleeding event would be monitored. Primary outcome is the change in THC with CD. Secondary outcome is the effect of CD to dialysis treatment outcome. Results Five patients were recruited, of whom 3(60%) were male and 2(40%) were female. Their ages ranged from 50 to 68 (mean 62.8 ± 7.25). The treatments were well tolerated by all 5 patients. Data were available from 98 successful HD sessions. There was a statistically significant reduction in total heparin consumption using CD (mean difference: -779.28 IU, $p = 0.012$). There were no significant within-subject differences in TMP (-6.75mmHg, $p = 0.170$), BFR (+11.34ml/min, $p = 0.37$), %TVFE (+1.45%, $p = 4.84$), and OCM (-0.102, $p = 0.194$). Conclusion Use of CD was well tolerated and could effectively reduce THC. There was no significant change in dialyzer function and patient's HD adequacy. CD could be an alternative for HD patients to reduce their anticoagulant usage during HD.