Treating Hemodialysis Patients with Heparin-Induced Thrombocytopenia (HIT)

Heparin is used extensively in dialysis, most commonly for:

- Bolus heparin infusions pre dialysis
- Intermittent bolus during treatment
- Locking dose of heparin for catheters post treatment
- Heparinization of dialyzers and blood tubing set pre dialysis

HIT occurs in 3% of patients who receive intravenous unfractionated heparin for treatment of deep vein thrombosis or pulmonary embolism.¹ Lesser heparin exposures such as; prophylactic subcutaneous doses, flushes to maintain arterial catheter patency and even the tiny amounts of heparin that leach from coated vascular catheters, produce HIT in 0.5% of patients.

In HIT, platelet counts fall by more than 30% within 5 to 12 days after initial exposure to heparin. The degree of thrombocytopenia is highly variable. Thrombocytopenia often is moderate ($80 to 100 \times 10^3/\mu$ L) and thus easily overlooked in an ICU or postoperative patient. However, modest thrombocytopenia may be the first clue to an impending HIT-related catastrophe. In one study ², many of the patients with HIT had platelet counts at or below 20 X 10³/µL, but bleeding was rare. Thirty percent to 75% of patients with HIT experience venous or arterial thromboemboli at the same time as or following the reduction in platelet count.^(3,4)

Warkentin suggests that up to 25% of patients with heparin-induced thrombocytopenia may suffer some acute systemic reaction to heparin, such as chills, rigors, fever, hypertension, tachycardia, flushing, diaphoresis, nausea, myalgias, even transient global amnesia; these reactions are sometimes preceded by inflamed lesions at subcutaneous injection sites. ^(5, 6, 7) There have been reports of acute cardio-respiratory collapse from heparin since its introduction into clinical practice. ^(8, 9, 10, 11)

Currently, dialysis treatments use saline flushes (generally ineffective) or regional citrate anticoagulation (dangerous expensive and labor intensive) to avoid using heparin.

Citrasate, a new acid concentrate for bicarbonate dialysis, is unique because it uses citrate in the dialysate. Citrate is a well-known anticoagulant that functions by binding calcium, thereby reducing the calcium available to participate in the blood clotting mechanism. Citrasate contains 2.4 mEq/L citric acid; well below the levels employed in regional citrate anticoagulation. In this concentration citrate dialysate has been successfully used for heparin-free dialysis of patients with antibodies to heparin⁽¹²⁾.

Citrasate is a cost-effective alternative for high risk patients who tend to be more costly to treat. These patients can be impacted by blood loss plus treatment may require additional bloodlines, dialyzers and time. Citrasate is also ideal with patients who have bleeding risk factors, i.e. trauma, post-surgery, impending surgery/procedure.

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