

A new mixture ratio of heparin for the cell salvage device

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Adequate cell salvage for extracorporeal circulation requires anticoagulants such as heparin. The guideline of the American Association of Blood Banks recommends that 1 L of 0.9% saline containing 30,000 units of heparin should be mixed with aspirated blood at a ratio of 15 ml per 100 ml of collected blood [1]. If we maintain the ratio of heparinized saline to blood at 15 : 100, we need 2 vials of the Korean heparin product because its maximum amount of heparin in a vial is 25,000 units [2]. Therefore, we developed an alternative method of anticoagulation using only 1 vial of heparin.

For extracorporeal circulation, the dose of heparin, which maintains an ACT of longer than 400–450 seconds, is 300–400 U/kg body weight [3]. To simplify calculation, we assume blood volume to be 70 ml/kg because the average blood volume of men is 75 ml/kg and that of women is 65 ml/kg. Since 70 ml of blood requires 300 units of heparin, 100 ml of blood requires 428 units of heparin. According to the guideline, 15 ml of heparinized saline contains 450 units of heparin because 1 L of heparinized saline contains 30,000 units of heparin. If we mix 25,000 units of heparin with 1 L of 0.9% saline, we need 18 ml

of heparinized saline to maintain the same amount of heparin because the new concentration of heparin is 25 units/ml. If we apply this method to a continuous autotransfusion system (CATS[®]), we should set the infusion rate at 234 drops per minute because 13 drops make 1 ml in the CATS.

In summary, we can use 1 vial of heparin (25,000 units) to prevent coagulation in the cell salvage device using our mixture ratio.

References

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