Research Article

Hypokalemia in a paediatric peripheral blood stem cell donor – A case report

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Abstract

Allogenic peripheral blood stem cell transplant is indicated in the treatment of leukemia. Peripheral blood stem cells are collected by the process of apheresis using Cell separators. Complications of apheresis like hypocalcemia are common but hypokalemia has been rarely reported. We present here, a case report, wherein the donor was in the paediatric age group and developed hypokalemia subsequent to apheresis.

Key words: Apheresis, peripheral blood stem cells, citrate, potassium, hypokalemia.

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CASE REPORT

The allogenic peripheral blood stem cell (PBSC) donor in this case was an 8 year old boy weighing 27 kg. He was a 6/6 HLA match for his elder sibling aged 12 years and weighing 32 kg who was a case of acute myeloid leukemia (AML) in remission. The family including the donor was educated and counselled regarding the donation process. Informed consent was obtained after explaining the risks involved and the eligibility of the donor ascertained by carrying out necessary investigations. The donor was given a conditioning regimen with granulocyte colony stimulating factor (G-CSF) to mobilise stem cells. A blood sample from the donor was sent for CD34 estimation by flowcytometry on Day 4 of G-CSF mobilization. The CD34 count was 120 per microlitre. Donor had a catheter (8 French) inserted in the femoral vein for vascular access. The total WBC count on day 5 was 51,000 per microlitre. Serum electrolytes including potassium (K+) levels were within normal limits before the apheresis was carried out. PBSC collection was carried out on day 5. Oral calcium supplementation was given 1 hour before start of the procedure. Peripheral blood stem cell collection was carried out using the Fresenius. COMTECH cell separator. Acid Citrate Dextrose (ACD) was used as the anticoagulant. Vitals were recorded before start of the procedure and at fifteen minute intervals thereafter until completion of the procedure. Vitals were stable throughout and oral calcium supplementation (one tablet of chewable calcium) was given at half hourly intervals. Donor tolerated the procedure well and no adverse reactions were reported or observed during the procedure. Duration of the procedure was 3 hours. Two blood volumes were processed to achieve the target yield. Product volume collected was 130 ml. Samples from the collection bag were sent for culture sensitivity testing and CD34 estimation. CD34 count on the product was 1780 per microlitre which approximated to 6 x 10^6 CD34 cells per kilogram body weight of the recipient. A complete hemogram and serum electrolyte levels in the donor were tested four hours post- donation. Hematological parameters were normal. Sodium, chloride, bicarbonate and calcium levels were within normal limits. There was a drop in serum potassium level from a pre-donation level

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of 3.5 mEq/L to 3.1 mEq/L post-donation but the donor was asymptomatic. Potassium levels were corrected by giving oral potassium supplements.

DISCUSSION

Stem cell donors of paediatric age group have lesser circulating blood volume. The extracorporeal blood volume in the apheresis circuit should be taken in to consideration to avoid adverse effects like hypotension. Citrate binds calcium and magnesium. Citrate anticoagulant related adverse effects like hypocalcemia are common in apheresis donors.[1] Citrate is metobolised to bicarbonate in the liver which causes increase in blood pH leading to shift of potassium from the extracellular to the intracellular compartment.[2] Dextrose present in ACD anticoagulant solution may cause increased insulin secretion which pushes potassium in to the cells causing hypokalemia. Hypokalemia may cause cardiac arrhythmias.[3] Other complications of apheresis like catheter related infections should be given due attention while managing apheresis donors.

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