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Therapeutic Plasma Exchange Reveals a Color-Coordinated Response to Cyclosporine-Induced Microangiopathic Hemolytic Anemia and Rifampin Following Stem Cell Transplant

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A 39 year old woman with T/NK-cell lymphoma developed microangiopathic hemolytic anemia (MAHA) associated with cyclosporine A (CSA) toxicity 15 days after allogeneic peripheral blood stem cell transplantation. Her serum creatinine level increased from 0.4 mg/dL pre-transplant to 1.0 and 2.9 mg/dL on days 9 and 15 post-transplant, respectively, leading to cessation of CSA therapy. Peripheral blood smears revealed a dramatic increase in schistocytes (4 per high-power field) on day 14. LDH levels rose from 708 to 4103 U/L on post-transplant days 1 and 15, respectively. Declining hemoglobin concentration and platelet count were attributed initially to the transplant rather than to evolving MAHA. Because of her critical condition, a 5-day course of daily therapeutic plasma exchange (TPE) was initiated as an extreme measure.

Plasma removed during the 1st TPE (Figure 1) illustrates the classic tea-color associated with MAHA. During the first 3 days of TPE, CSA levels were 113, 95, and 106 mcg/L. Rifampin, a potent inducer of cytochrome 450 3A4, was administered on days 18 and 19 to promote clearance of CSA. Rifampin stains body fluids a characteristic orange-red color, noted in the plasma removed during the 4th TPE (Figure 2). Plasma color returned to clear yellow by the final day of TPE (Figure 3). Creatinine levels peaked at 4.6 mg/dL on day 19. CSA and creatinine levels declined to 48 mcg/L and 3.4 mg/dL, respectively, the day following completion of TPE and rifampin administration, and further decreased to 34 mcg/L and 1.6 mg/dL 2 days later.

Figure 1.
Plasma removed during first TPE demonstrating classic tea-colored plasma associated with MAHA.

Figure 2.
Orange-red plasma removed during fourth TPE after administration of rifampin to promote clearance of CSA.

Figure 3.
Clear yellow plasma removed during fifth and final TPE procedure.