
Abstract:

Aims and objectives – To identify differences in cyclosporine levels between blood samples collected from a peripheral venous access, catheter line used for drug infusion and catheter line not used for drug infusion in adult patients receiving allogeneic haematopoietic stem cell transplantation.

Background – Cyclosporine is an immunosuppressant that prevents graft-versus-host disease, has a narrow therapeutic window and causes nephrotoxicity. For cyclosporine infusion, a tunnelled central venous access device is used; however, because of the lipophilic properties of the drug, it can adsorb to the catheter surface and falsely raise cyclosporine concentrations in blood specimens.

Design – Prospective observational study.

Methods – The study collected 135 blood samples from 16 patients. In 13 subjects, samples were obtained from the three lines at three time points (1, 7 and 14 days after the start of cyclosporine infusion), and for three subjects, samples were only obtained at 1 and 7 days after the start of infusion. The 5-ml blood discard method was used for samples collected from the catheter. Using this procedure, the catheter line was washed with saline solution, 5 ml of blood and saline solution were aspirated from the catheter line and discarded, and then sample blood used for the test was collected. The paired t-test with the Bonferroni correction was used to analyse the differences in cyclosporine serum levels.

Results – Significant differences were observed when the drug serum levels obtained in the line used for drug infusion were compared with the levels obtained in the line not used for infusion or the peripheral venous line. No differences in drug levels were identified in blood collected from the peripheral venous line and the line not used for drug infusion.
Conclusion - Drug adsorption occurs in the line used for infusion. Therefore, the blood sample collected from the line not used for cyclosporine infusion can be considered reliable for drug concentration determination.

Relevance to clinical practice - Nurses should standardise one line of the tunnelled central venous access device for cyclosporine infusion, which avoids the need for evasive procedures and provides patients with more comfort.