

“The increasing use of vancomycin means that new guidelines are required to avoid phlebitis. If peripheral intravenous therapy is used to reduce infusion time, along with intermittent infusion, vein irritation and localized phlebitis may be reduced.” Drouet et al

Reference:

Drouet, M., Chai, F., Barthélémy, C., Lebuffe, G., Debaene, B., Décaudin, B. and Odou, P. (2014) Influence of vancomycin infusion methods on endothelial cell toxicity. Antimicrobial Agents and Chemotherapy. November 24th. .

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Abstract:

Peripheral Intravenous (PIV) therapy is frequently used in routine hospital practice and, due to various factors, its most common side-effect is phlebitis. The infusion of vancomycin is particularly associated with phlebitis despite its widespread use. French guidelines recommend central IV infusion for high concentrations of vancomycin, but PIV is often preferred in intensive care units. Methods of vancomycin infusion are either intermittent infusion or continuous infusion. A comparison of these methods in in-vitro conditions simulating clinical use could result in better infusion efficacy. Human Umbilical Vein Endothelial Cells (HUVEC) cells were therefore challenged with clinical doses of vancomycin over a 24h to 72h period and with the above infusion methods. Cell death was measured with the AlamarBlue® test. Concentration-dependent and time-dependent vancomycin toxicity on HUVEC cells was noted with a Lethal Dose 50 at 5 mg/ml after 24h, reaching 2.5 mg/ml after 72h infusion, simulating long-term infusion. This toxicity does not seem to be induced by acidic pH. Comparing infusion methods, we observed that continuous infusion induced greater cell toxicity than intermittent infusion at doses higher than 1 g/day. The increasing use of vancomycin means that new guidelines are required to avoid phlebitis. If peripheral intravenous therapy is used to reduce infusion time, along with intermittent infusion, vein irritation and localized phlebitis may be reduced. Further studies have to be carried out to explore the causes of vancomycin endothelial toxicity.

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