

necessary to determine national trends in both the implementation of the Department of Health's guidelines and surgeons' awareness of them.

Contributors: SED wrote the questionnaire, collected and analysed the data, and wrote the paper. CKMW had the original idea for the study, advised on the questionnaire design, and helped to write the paper. REM advised on the questionnaire design and helped to write the paper. SED will act as guarantor for the paper.

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- Henderson DK, Fahey BJ, Willy M, Schmitt JM, Carey K, Koziol DE, et al. Risk for occupational transmission of human immunodeficiency virus

type-1 (HIV-1) associated with clinical exposures. A prospective evaluation. *Ann Intern Med* 1990;113:740-6.

- Tokars JI, Marcus R, Culver DH, Schable CA, McKibben PS, Bandea CI, et al. Surveillance of HIV infection and zidovudine use among health care workers after occupational exposure to HIV-infected blood. *Ann Intern Med* 1993;118:913-9.
- Gerberding JL. Incidence and prevalence of human immunodeficiency virus, hepatitis B virus, hepatitis C virus, and cytomegalovirus among health care personnel at risk for blood exposure: final report from a longitudinal study. *J Infect Dis* 1994;170:1410-7.
- Cardo DM, Culver DH, Ciesielski CA, Srivastava PU, Marcus R, Abiteboul D. Case-control study of HIV seroconversion in health care workers after percutaneous exposure. *N Engl J Med* 1997;337:1485-90.
- Department of Health. *Guidelines on post-exposure prophylaxis for health care workers occupationally exposed to HIV* London: DoH, 1997.

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Drug points

Possible interaction between clindamycin and cyclosporin

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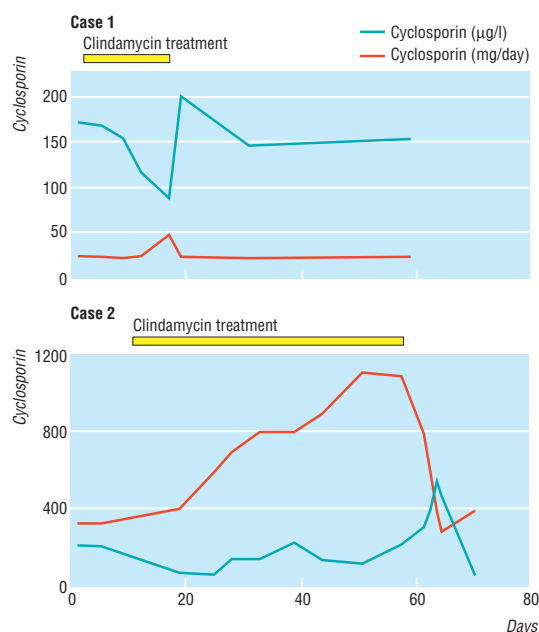
We report two cases of a suspected interaction between clindamycin and cyclosporin.

Case 1 was in a 48 year old woman with α_1 -antitrypsin deficiency who had right sided single lung transplantation for end stage pulmonary emphysema. After B cell lymphoma affecting the transplanted lung was diagnosed, immunosuppression was reduced to a target concentration of cyclosporin of 100-150 $\mu\text{g/l}$. Owing to bronchopulmonary infection with *Staphylococcus aureus*, treatment with oral clindamycin 600 mg thrice daily was begun. Serum cyclosporin concentrations fell continuously so the daily dose was increased. After clindamycin treatment was stopped cyclosporin was reduced to the same dose as before antibiotic treatment (figure).

Case 2 was in a 39 year old woman with cystic fibrosis who developed bilateral pneumonia seven weeks after double lung transplantation. Bronchoalveolar washings showed *S aureus*. Antibiotic treatment with oral clindamycin 600 mg thrice daily was started. Over four weeks the dose of cyclosporin was continuously increased from 325 mg to 1100 mg daily to maintain serum concentrations around 200 $\mu\text{g/l}$. After clindamycin treatment was stopped the dose of cyclosporin was reduced to the same dose as before antibiotic treatment (figure).

Cyclosporin is extensively metabolised by the liver. Therefore, circulating cyclosporin concentrations may be influenced by drugs such as macrolide antibiotics which affect hepatic microsomal enzymes, particularly the cytochrome P-450 system.^{1,2} However, we did not find any reports of an effect of clindamycin on the P-450 pathway in literature databases or the manufacturer's medical event reporting system (Pharmacia Upjohn, personal communication). The oral bioavailability of cyclosporin depends on the intestinal P-glycoprotein (mdr1), which partly explains the large variation in daily dose of cyclosporin required among transplant recipients.³ Again, we found no information about the effects of clindamycin on intestinal carrier proteins.

A drug interaction is possible, and close monitoring of cyclosporin serum concentrations is warranted to avoid underdosing of immunosuppressed patients.



Cyclosporin concentrations and clindamycin treatment in cases 1 and 2

- Spicer ST, Liddle C, Chapman JR, Barclay P, Nankivel BJ, Thomas P, et al. The mechanism of cyclosporine toxicity induced by clarithromycin. *Br J Clin Pharmacol* 1997;43:194-6.
- Ferrari SL, Goffin E, Mourad M, Wallemacq P, Squifflet JP, Pirson Y. The interaction between clarithromycin and cyclosporine in kidney transplant recipients. *Transplantation* 1994;58:725-7.
- Lown KS, Mayo RR, Leitchman AB, Hsiao H, Turgeon DK, Schmiedlin-Ren P, et al. Role of intestinal P-glycoprotein (mdr1) in interpatient variation in the oral bioavailability of cyclosporine. *Clin Pharmacol Ther* 1997;62:248-60.

Correction

Reducing the risk of major elective surgery: randomised controlled trial of preoperative optimisation of oxygen delivery

An error occurred in this paper by Jonathan Wilson and colleagues (24 April, pp 1099-103). On p 1102 in the section headed "Oxygen delivery as a goal," the second sentence cited litres instead of millilitres. The sentence should have started "When oxygen delivery falls below 390 ml/min/m² [not l/min/m²]. . ."