

Klinisch wichtige Interaktionen von Antimykotika

Wolfgang Kämmerer, Wiesbaden

Arzneimitteltherapie 2005;23:72–80.

- Bates DW, Tony Yu D. Clinical impact of drug-drug interactions with systemic azole antifungals. *Drugs Today* 2003;39:801–13.
- Drug information for professionals (www.drugs.com).
- DrugDex Datenbank (CD-ROM), Micromedex Inc., 2004.
- DrugInfo (über: www.medscape.com).
- DrugReax Datenbank (CD-ROM), Micromedex Inc., 2004.
- Fachinformationen: www.fachinfo.de
- Blum RA, D'Andrea DT, Florentino BM, et al. Increased gastric pH and the bioavailability of fluconazole and ketoconazole. *Ann Intern Med* 1991;114:755–7.
- Barone JA, Koh JG, Bierman RH, et al. Food interaction and steady-state pharmacokinetics of itraconazole capsules in healthy male volunteers. *Antimicrob Agents Chemother* 1993;37:778–84.
- May DB, Drew RH, Yedinak KC, et al. Effect of simultaneous didanosine administration on itraconazole absorption in healthy volunteers. *Pharmacotherapy* 1994;14:509–13.
- Van Peer A, Woestenborghs R, Heykants J, et al. The effects of food and dose on the oral systemic availability of itraconazole in healthy subjects. *Eur J Clin Pharmacol* 1989;36:423–6.
- Carlson JA, Mann HJ, Canafax DM. Effect of pH on disintegration and dissolution of ketoconazole tablets. *Am J Hosp Pharm* 1983;40:1334–6.
- Lelawongs P, Barone JA, Colaizzi JL, et al. Effect of food and gastric acidity on absorption of orally administered ketoconazole. *Clin Pharm* 1988;7:228–35.
- Van der Meer JWM, Keuning JJ, Scheijgrond HW, et al. The influence of gastric acidity on the bioavailability of ketoconazole. *J Antimicrob Chemother* 1980;6:552–4.
- Cytochrom-P450-System (<http://medicine.iupui.edu/flockhart>).
- Ahonen J, Olkkola KT, Takala A, et al. Interaction between fluconazole and midazolam in intensive care patients. *Acta Anaesthesiol Scand* 1999;43:509–14.
- Apseloff G, Hilligoss DM, Gardner MJ, et al. Induction of fluconazole metabolism by rifampin: in vivo study in humans. *J Clin Pharmacol* 1991;31:358–61.
- Baciewicz AM, Menke JJ, Bokar JA, et al. Fluconazole-warfarin interaction (letter). *Ann Pharmacother* 1994;28:1111.
- Cadle RM, Zenon GJ III, Rodriguez-Barradas MC, et al. Fluconazole-induced symptomatic phenytoin toxicity. *Ann Pharmacother* 1994;28:191–5.
- Canafax DM, Graves NM, Hilligoss DM, et al. Increased cyclosporine levels as a result of simultaneous fluconazole and cyclosporine therapy in renal transplant recipients: a double-blind, randomized pharmacokinetic and safety study. *Transplant Proc* 1991;23:1041–2.
- Coker RJ, Tomlinson DR, Parkin J, et al. Interaction between fluconazole and rifampicin. *Br Med J* 1990;301:818.
- Dorsey ST, Biblo LA. Prolonged QT interval and torsades de pointes caused by the combination of fluconazole and amitriptyline (letter). *Am J Emerg Med* 2000;18:227–9.
- Ellis KW, Smith EA, Baddour LM. Immediate potentiation of the hypoprothrombinemic response of warfarin by fluconazole. *Infect Dis Clin Prac* 1999;8:351–4.
- Greenblatt DJ, von Moltke LL, Harmatz JS, et al. Kinetic and dynamic interaction study of zolpidem with ketoconazole, itraconazole, and fluconazole. *Clin Pharmacol Ther* 1998;64:661–71.
- Kantola T, Backman J, Niemi M, et al. Effect of fluconazole on plasma fluvastatin and pravastatin concentrations. *Eur J Clin Pharmacol* 2000;56:225–9.
- Kerr H. Case report: potentiation of warfarin by fluconazole. *Am J Med Sci* 1993;305:164–5.
- Konishi H, Morita K, Yamaji A. Effect of fluconazole on theophylline disposition in humans. *Eur J Clin Pharmacol* 1994;46:309–12.
- Lazar JD, Wilner KD. Drug interactions with fluconazole. *Rev Infect Dis* 1990;12(suppl. 3):S327–33.
- Nair DR, Morris HH. Potential fluconazole-induced carbamazepine toxicity. *Ann Pharmacother* 1999;33:790–2.
- Robinson R, Nahata M, Olshefski R. Syncope associated with concurrent amitriptyline and fluconazole therapy. *Ann Pharmacother* 2000;34:1406–9.
- Shaukat A, Benekli M, Vladutiu G, et al. Simvastatin-fluconazole causing rhabdomyolysis. *Ann Pharmacother* 2003;37:1032–5.
- Auclair B, Berning SE, Huit GA, et al. Potential interaction between itraconazole and clarithromycin. *Pharmacotherapy* 1999;19:1439–44.
- Backman J, Kivisto K, Olkkola K, et al. The area under the plasma concentration-time curve for oral midazolam is 400-fold larger during treatment with itraconazole than with rifampicin. *Eur J Clin Pharmacol* 1998;54:53–8.
- Billaud EM, Guillemain R, Tacco F, et al. Evidence for a pharmacokinetic interaction between itraconazole and tacrolimus in organ transplant patients (letter). *Br J Clin Pharmacol* 1998;46:271–4.
- Bohme A, Ganser A, Hoelzer D. Aggravation of vincristine-induced neurotoxicity by itraconazole in the treatment of adult ALL. *Ann Hematol* 1995;71:311–2.
- Bonay M, Jonville-Bera AP, Diot P, et al. Possible interaction between phenobarbital, carbamazepine and itraconazole. *Drug Saf* 1993;9:309–11.
- Bosque E. Possible drug interaction between itraconazole and vinorelbine tartrate leading to death after one dose of chemotherapy. *Ann Intern Med* 2001;134:427.
- Buggia I, Zecca M, Alessandrino EP, et al. Itraconazole can increase systemic exposure to busulfan in patients given bone marrow transplantation. *Anticancer Res* 1996;16:2083–8.
- Capone D, Gentile A, Imperatore P, et al. Effects of itraconazole on tacrolimus blood concentrations in a renal transplant recipient (letter). *Ann Pharmacother* 1999;33:1124–5.
- Drayton J, Dickinson G, Rinaldi MG. Co-administration of rifampin and itraconazole leads to undetectable levels of serum itraconazole. *Clin Infect Dis* 1994;18:266.
- Ducharme MP, Slaughter RL, Warbasse LH, et al. Itraconazole and hydroxyitraconazole serum concentrations are reduced more than tenfold by phenytoin. *Clin Pharmacol Ther* 1995;58:617–24.
- Gillies J, Hung KA, Fitzsimons E, et al. Severe vincristine toxicity in combination with itraconazole. *Clin Lab Haematol* 1998;20:123–4.
- Horn M. Co-administration of itraconazole with hypolipidemic agents may induce rhabdomyolysis in healthy individuals. *Arch Dermatol* 1996;132:1254.
- Jalava K, Olkkola KT, Neuvonen PJ. Itraconazole greatly increases plasma concentrations and effects of felodipine. *Clin Pharmacol Ther* 1997;61:410–5.
- Kantola T, Kivisto KT, Neuvonen PJ. Effect of itraconazole on the pharmacokinetics of atorvastatin. *Clin Pharmacol Ther* 1998;64:58–65.

Dr. Wolfgang Kämmerer, Apotheke der Dr.-Horst-Schmidt-Kliniken GmbH, Ludwig-Erhard-Straße 100, 65199 Wiesbaden

45. Kaukonen KM, Olkkola KT, Neuvonen PJ. Itraconazole increases plasma concentrations of quinidine. *Clin Pharmacol Ther* 1997;62:510–7.
46. Kivisto KT, Lamberg TS, Kantola T, et al. Plasma buspirone concentrations are greatly increased by erythromycin and itraconazole. *Clin Pharmacol Ther* 1997;62:348–54.
47. Kwan JTC, Foxall PJD, Davidson DGC, et al. Interaction of cyclosporine and itraconazole. *Lancet* 1987;2:282.
48. Lees RS, Lees AM. Rhabdomyolysis from the coadministration of lovastatin and the antifungal agent itraconazole (letter). *N Engl J Med* 1995;333:664–5.
49. MacKenzie-Wood AR, Whitfield MJ, Ray JE. Itraconazole and HIV protease inhibitors: an important interaction (letter). *Med J Aust* 1999;170:46–7.
50. Neuvonen PJ, Jalava KM. Itraconazole drastically increases plasma concentrations of lovastatin and lovastatin acid. *Clin Pharmacol Ther* 1996;60:54–61.
51. Neuvonen PJ, Suhonen R. Itraconazole interacts with felodipine. *J Am Acad Dermatol* 1995;33:134–5.
52. Olkkola KT, Ahonen J, Neuvonen PJ. The effect of the systemic antimycotics, itraconazole and fluconazole, on the pharmacokinetics and pharmacodynamics of intravenous and oral midazolam. *Anesth Analg* 1996;82:511–6.
53. Raaska K, Niemi M, Neuvonen M, et al. Plasma concentrations of inhaled budesonide and its effects on plasma cortisol are increased by the cytochrome P4503A4 inhibitor itraconazole. *Clin Pharmacol Ther* 2002;72:362–9.
54. Varis T, Kaukonen KM, Kivisto KT, et al. Plasma concentrations and effects of oral methylprednisolone are considerably increased by itraconazole. *Clin Pharmacol Ther* 1998;64:363–8.
55. Varis T, Kivisto K, Backman J, et al. The cytochrome P4503A4 inhibitor itraconazole markedly increases the plasma concentrations of dexamethasone and enhances its adrenal-suppressant effect. *Clin Pharmacol Ther* 2000;68:487–94.
56. Yasui N, Kondo T, Otani K, et al. Effect of itraconazole on the single oral dose pharmacokinetics and pharmacodynamics of alprazolam. *Psychopharmacology* 1998;139:269–73.
57. Yeh J, Soo SC, Summerton C, et al. Potentiation of action of warfarin by itraconazole (letter). *Br Med J* 1990;301:669.
58. Brown MW, Maldonado AL, Meredith CG, et al. Effect of ketoconazole on hepatic oxidative drug metabolism. *Clin Pharmacol Ther* 1985;37:290–7.
59. Doble N, Shaw R, Rowland-Hill C, et al. Pharmacokinetic study of the interaction between rifampicin and ketoconazole. *J Antimicrob Chemother* 1988;21:633–5.
60. Fleishaker J, Herman B, Carel B, et al. Interaction between ketoconazole and almotriptan in healthy volunteers. *J Clin Pharmacol* 2003;43:423–7.
61. Floren LC, Bekersky I, Benet LZ, et al. Tacrolimus oral bioavailability doubles with coadministration of ketoconazole. *Clin Pharmacol Ther* 1997;62:41–9.
62. Gilad R, Lampl Y. Rhabdomyolysis induced by simvastatin and ketoconazole treatment. *Clin Neuropharmacol* 1999;22:295–7.
63. Glynn AM, Slaughter RL, Brass C, et al. Effects of ketoconazole on methylprednisolone pharmacokinetics and cortisol secretion. *Clin Pharmacol Ther* 1986;39:654–9.
64. Greenblatt DJ, Von Moltke LL, Harmatz JS, et al. Interaction of triazolam and ketoconazole (letter). *Lancet* 1995;345:191.
65. Heinig R, Adelmann HG, Ahr G. The effect of ketoconazole on the pharmacokinetics, pharmacodynamics and safety of nisoldipine. *Eur J Clin Pharmacol* 1999;55:57–60.
66. Kehrer D, Mathijssen R, Verwei J, et al. Modulation of irinotecan metabolism by ketoconazole. *J Clin Oncol* 2002;20:3122–9.
67. Keogh A, Spratt P, McCosker C, et al. Ketoconazole to reduce the need for cyclosporine after cardiac transplantation. *N Engl J Med* 1995;333:628–33.
68. Khaliq Y, Gallicano K, Venance S, et al. Effect of ketoconazole on ritonavir and saquinavir concentrations in plasma and cerebrospinal fluid from patients infected with human immunodeficiency virus. *Clin Pharmacol Ther* 2000;68:637–46.
69. Krishnaiah YSR, Satyanarayana S, Visweswaram D. Interaction between tolbutamide and ketoconazole in healthy subjects. *Br J Clin Pharmacol* 1994;37:205–7.
70. Magnasco AJ, Magnasco LD. Interaction of ketoconazole and ethanol. *Clin Pharm* 1986;5:522–3.
71. McNulty RM, Lazor JA, Sketch M. Transient increase in plasma quinidine concentrations during ketoconazole-quinidine therapy. *Clin Pharm* 1989;8:222–5.
72. Piscitelli SC, Goss TF, Wilton JH, et al. Effects of ranitidine and sucralfate on ketoconazole bioavailability. *Antimicrob Agents Chemother* 1991;35:1765–71.
73. Polk RE, Crouch MA, Israel DS, et al. Pharmacokinetic interaction between ketoconazole and amprenavir after single doses in healthy men. *Pharmacotherapy* 1999;19:1378–84.
74. Seidegard J. Reduction of the inhibitory effect of ketoconazole on budesonide pharmacokinetics by separation of their time of administration. *Clin Pharmacol Ther* 2000;67:13–7.
75. Smith AG. Potentiation of oral anticoagulants by ketoconazole. *Br Med J* 1984;288:188–9.
76. Purkins L, Wood N, Kleinermans D, Nichols D. Voriconazole potentiates warfarin-induced prothrombin time prolongation. *Br J Clin Pharmacol*. 2003;56(Suppl. 1):24–9.
77. Romero A, Le Pogamp P, Nilsson L, et al. Effect of voriconazole on the pharmacokinetics of cyclosporine in renal transplant patients. *Clin Pharmacol Ther* 2002;71:226–34.
78. Wood N, Tan K, Purkins L, Layton G, et al. Effect of omeprazole on the steady-state pharmacokinetics of voriconazole. *Br J Clin Pharmacol*. 2003;56(Suppl. 1):56–61.
79. Venkataraman R, et al. Voriconazole inhibition of the metabolism of tacrolimus in a liver transplant recipient and in human liver microsomes. *Antimicrob Agents Chemother* 2002;46:3091–3.
80. Alderman CP, Jersmann HPA. Digoxin-itraconazole interaction. *Med J Aust* 1993;159:838–9.
81. Jalava KM, Partanen J, Neuvonen PJ. Itraconazole decreases renal clearance of digoxin. *Ther Drug Monit* 1997;19:609–13.
82. Mathis S, Friedman G. Coadministration of digoxin with itraconazole in renal transplant recipients. *Am J Kidney Dis* 2001;37:1–8.
83. Sachs MK, Blanchard LM, Green PJ. Interaction of itraconazole and digoxin. *Clin Infect Dis* 1993;16:400–3.