

is a recognized clinical subtype of dermatophytosis and no new classification schedule is being introduced herein. Candidal onychomycosis has three recognized clinical variants and chronic paronychia is one of them. Candida is a known primary pathogen of the nail plate and not a secondary invader as suggested by the respondent. In addition, presence of nail dystrophy is not essential in this condition; only erosion of the distal nail plate is, which was present in our cases. In any case, candidal onychomycosis must never be confused with chronic mucocutaneous candidiasis (CMC), which is a syndrome consisting of persistent candidal infection of the skin, the nail and the mouth. Only a few of these cases, when associated with systemic infections, may represent a manifestation of primary defect of the immune system. As already mentioned, patients with systemic diseases were excluded from the study; and so did not include any cases of CMC.

REFERENCES

1. English MP. Nails and fungi. *Br J Dermatol* 1976;94:697-701.
2. Gupta AK, Ryder JE, Summerbell C. The diagnosis of non-dermatophyte mold onychomycosis. *Int J Dermatol* 2003;42:272-3.
3. Tosti A, Piraccini BM, Lorenzi S. Onychomycosis caused by non-dermatophyte moulds: Clinical features and response to treatment of 59 cases. *J Am Acad Dermatol* 2000;42:217-24.
4. Hay RJ, Moore M. Mycology (Superficial and cutaneous mycosis). In: Champion RH, Burton JL, Burns DA, Breathnach SM, editors. *Textbook of dermatology*. 6th ed. Oxford: Blackwell Science; 1998. p. 1281-350.

Sanjiv Grover

Department of Dermatology, Air Force Hospital, Agram PO, Bangalore - 560007. India.

Grapefruit juice vs. grape juice

Sir,

While reading the article 'Drugs in dermatological practice: Relationship to food'¹ I saw that it is advised not to take cyclosporin with grape juice. I would like to point out that it is grapefruit juice and not grape juice which produces elevated serum concentrations of cyclosporin.² In fact many western hospitals have removed grapefruit juice from their inpatient menus to avoid the risk of drug interactions.

Grapefruit (*Citrus X paradisi*) is a citrus fruit which inhibits the CYP3A4 pathway in the small intestinal wall when either fresh or frozen grapefruit is eaten or grapefruit juice is drunk.³ This inhibition may be due to Bergamottin, a furocoumarin compound or due to other flavonoids present in it. This results in elevation of serum concentrations of all drugs which are metabolized via the CYP3A4 pathway including cyclosporine, felodipine, nifedipine, saquinavir, midazolam, triazolam, terazosin, ethinyloestradiol, 17-beta oestradiol, prednisone, lovastatin, simvastatin etc. Absence of 6,7-Dihydrobergamottin in orange juice probably accounts for the absence of CYP inhibitory effects.⁴ Pronounced elevation of the maximal plasma concentrations are seen with drugs that have high first pass metabolism (metabolism of a drug during its passage from the site of absorption into the systemic circulation- at the small intestinal wall and in the liver in case of orally administered drugs). In fact, this inhibitory effect of grapefruit juice on the metabolism of cyclosporin may be used to achieve therapeutic plasma concentrations of the drug at lower dosage levels than usual, but this is not recommended as the effect varies with different batches of grapefruit.

REFERENCES

1. Smitha Prabhu, SD Sheno. Drugs in dermatological practice: Relationship to food. *Indian J Dermatol Venereol Leprol* 2003;69:305-6
2. Shapiro LE, Shear NH. Drug Interactions. In: Wolverson SE, editor. *Comprehensive Dermatological Drug Therapy*. WB Saunders; 2001. p. 848-71.
3. Roller L. Drugs and grapefruit juice (letter). *Clin Pharmacol Ther* 1998;1:87.
4. Hollander AA, van der Woude FJ, Cohen AF. Effect of grapefruit juice on blood cyclosporin concentration (letter). *Lancet* 1995;346:123.

M. J. Cyriac

Department of Dermatology and Venereology, Medical College, Kottayam, India. E-mail: drmjcyriac@hotmail.com

Response by the authors

Sir,

We wish to thank Dr M. J. Cyriac for spotting the error and enlightening the readers about the interaction of cyclosporin with grapefruit and not grape juice. We



are happy that our article has been thoroughly scrutinized.

A point to be noted is that although sweet orange juice is safe, a variety of sour oranges used in marmalades called Seville oranges contain 6,7 dihydroxybergamottin, the furanocoumarin compound found in grapefruit. However a recent study¹ has not found interaction of Seville orange juice with cyclosporine.

REFERENCE

1. Edwards DJ, Fitzsimmons ME, Schuetz EG et al. 6, 7 dihydroxybergamottin in grapefruit juice and Seville orange juice: effects on cyclosporine disposition, enterocyte CYP3A4 and P-glycoprotein. Clin Pharmacol Ther 1999;65: 237-44.

Smita Prabhu, S. D. Shenoi

Department of Skin & STD, Kasturba Medical College & Hospital, Manipal, India.

