Objective Assessment of Terbinafine-Induced Taste Loss

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INTRODUCTION

- Terbinafine (Lamisil)
  - Oral antifungal agent
  - Treat finger and toenail fungal infections
  - Induces taste loss in 0.6% to 2.8%
  - Occurs after 4 to 6 weeks of drug use
  - Subjective recovery occur after 4 months of symptom

- Using well-validated taste and smell tests

- Quantitatively assessed chemosensory function
MATERIALS AND METHODS

Between April, 1999, and October, 2004

The Smell and Taste Center, University of Pennsylvania School of Medicine

Six (3 female and 3 male nonsmokers) patients were 44 to 83 years of age

Six age-, sex- and smoking–habit-matched subjects with no reported chemosensory deficits were given equivalent tests

tongue region (anterior left, anterior right, posterior left, posterior right) as a within-subject factor
MATERIALS AND METHODS

Taste function

15 µL of single concentrations of sucrose (0.49 M), sodium chloride (0.31 M), citric acid (0.015 M), and caffeine (0.04 M)

- equal psychologic intensity and physical viscosity (1.53 mm²/s²),
- are presented using an Eppendorf pipette

96-trial regional test that assesses sweet, sour, bitter, and salty taste perception
- 4 tastants x 6 trials x 4 tongue regions
MATERIALS AND METHODS

Smell function

- Using the 40-item University of Pennsylvania Smell Identification Test (UPSIT)
  - widely used standardized test of olfactory function

- Identify the name of the odor from a list of 4 alternatives for each of 40 microencapsulated odorants
RESULTS

- Sweet-, sour-, and bitter-tasting stimuli was significantly depressed in both the anterior and posterior lingual regions

- Sodium chloride, the decrements were confined to the posterior region

- Olfactory function was within normal limits
Fig. 1. The mean taste test scores were significantly lower in the terbinafine than in the control group for all stimuli, with sour (citric acid) and bitter (caffeine) perception being altered more severely than sweet (sucrose) and salty (NaCl) perception.
Fig. 2. A tongue region by group interaction approached significance for NaCl ($P = .07$), reflecting poorer performance on the posterior (CN IX) regions of the tongue.
DISCUSSION

The first to objectively verify the chemosensory complaints of patients.

Sweet sensation was maintained longer than sour or bitter sensation.

Mechanisms responsible for the terbinafine-induced taste loss remain unknown.
DISCUSSION

Terbinafine
- Inhibit squalene epoxidase (SE)
  - Inhibit fungal sterol synthesis pathway
  - Inhibits ergosterol biosynthesis
  - Inhibit fungal cell membrane

Terbinafine alters the cell structure or function of taste-related neurons by way of the cholesterol pathway
DISCUSSION

- Electrophysiologic studies in nonhuman primates
  - more sucrose-best and NaCl-best fibers are present in the chorda tympani nerve

- Risk factors for terbinafine-induced taste loss
  - > 65 y/o
  - BMI < 21 kg m-2
CONCLUSIONS

- Support anecdotal case reports of taste loss after terbinafine use
- Demonstrate that all four major taste qualities are affected
- Olfactory dysfunction is not involved
- Much higher prevalence of terbinafine-induced taste loss
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