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Taste disturbances linked to drug use

Change in drug therapy may resolve symptoms

MEDICATIONS ARE OFTEN RESPONSIBLE FOR TASTE DISTURBANCES — in one report, drugs were found to be the cause in roughly 22% to 28% of cases.[1] The majority of these patients were taking the medications for an extended period of time and, in most cases, a combination of two or three agents were implicated.

There are four categories of drug-induced taste disturbance:

1. **Ageusia**, the complete loss of at least one of the four taste sensations (salt, sweet, sour, and bitter), occurs rarely.
2. **Hypogeusia** involves an increase in the taste threshold, leading to a decrease in taste perception.
3. **Dysgeusia** occurs as an altered perception of taste (i.e., markedly sweet, bitter, salty, or metallic taste).
4. **Parageusia** is an abnormal or bad taste in the mouth; it may be mistaken for dysgeusia.[2]

Taste buds, derived from epithelial cells, are found on the dorsal and lateral surfaces of the tongue and soft palate. Via saliva and mucus transport, stimuli arrive to interact with taste cells and initiate the taste impulse. These cells are innervated by afferent neurons, with involvement of the facial, glossopharyngeal, and vagus nerves. The taste afferent nerves synapse (connect) in the medulla, and the signal then travels to the thalamus and primary gustatory complex. The sense of smell (i.e., olfaction) is integral to the perception of taste, and patients frequently mistake an alteration in olfaction for a taste disturbance.[3] Certain medical conditions, such as allergic rhinitis, diabetes, and upper respiratory tract infection, and drugs (Table 1) may lead to disturbances in the sense of smell.[1,2,4]

Drugs may alter taste by a number of potential mechanisms. They may be tasted in the mouth upon initial ingestion or when re-secreted in saliva. In drug-induced xerostomia (dryness of the mouth, sometimes caused by antidepressants and other drugs with anticholinergic effects), less saliva is available to transport tastants to the taste buds. In addition, drugs can pass from the blood to taste cells or may affect the turnover of these cells. Drugs causing a negative effect on calcium channels may affect the taste impulse.[3] Zinc deficiency is linked to taste disturbances, and many drugs chelate zinc in the body.[1,2] One report estimated that roughly half of patients presenting with drug-induced taste disturbances had reduced zinc levels.[1]

Table 1 lists drugs implicated in taste disturbances. The incidence rate is provided when possible, but for many drugs only case reports are available.[1,2,4-6] In general, taste disturbances have a gradual onset, are dose-related, and resolve upon discontinuation of therapy. However, in certain cases, the disturbance will persist for weeks to months after the drug is discontinued.[4] In the case of ACE inhibitors, the effect may be permanent.[2] Disturbances in taste can also be related to advanced age (i.e., hypogeusia) and certain medical conditions (e.g., viral infections, cancer, diabetic neuropathy).[2,3]

Treatment of drug-induced taste disturbances depends on the cause and type of disturbance. Xerostomia may be managed with the use of artificial saliva preparations and oral pilocarpine (i.e., 10 mg to 15 mg), where appropriate. Masking techniques, such as breath mints, sugarless gum, and lozenges, may be tried for xerostomia as well as for dysgeusia. Lozenges containing local anesthetics may be tried for dysgeusia.

Zinc supplementation (25 mg to 100 mg of elemental zinc per day) may be effective for treating taste disturbances caused by a deficiency. Several weeks of treatment are required before an effect is achieved.[7] Nonetheless, one report found that 94% of patients with chemosensory disturbances treated with zinc had no response. Drug-induced taste disturbances may respond to a reduction in dose or by substitution with another drug in the same class, for example, switching from captopril to enalapril.[2]

Drugs are a common cause of taste disturbances. Patients presenting with such complaints should have non-drug-related causes ruled out before the interventions discussed above are attempted.

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This article was written by Mirella Giudice, BScPharm, ACPR, and was reviewed by Dina MacLeod, BScPharm, ACPR, and Norma Lynn Pearson, BScPharm, all of whom are drug information pharmacists with the Ottawa Valley Regional Drug Information Service.

TABLE 1 Drugs causing taste disturbances[1,2,4-6†]

Taste disturbance	Drugs
Ageusia/ hypogeusia	ACE inhibitors* (1%-5%, see separate listing for captopril), acetaminophen* (<1%), amphetamines, amiloride (<1%), amphotericin B, ampicillin (5%), aspirin* (1%), azathioprine, baclofen (<1%), benzodiazepines (0.1%-1%), bleomycin (10%), bretylium, candesartan, captopril* (1%-20%), carbamazepine (<1%), carboplatin, cephalosporins (<1%), chlorhexidine, cholestyramine (1%), clarithromycin (0.1%-1%), cimetidine, cisplatin,* clopidogrel, colchicine, corticosteroids* (<1%), cyclobenzaprine (1%-3%), cytarabine, diazoxide* (<1%), dicyclomine, didanosine (1%-10%), diltiazem* (1%), doxorubicin,* ethacrynic acid (<1%), ethambutol,* etidronate (<1%), furosemide,* glycopyrrolate, gold salts,* hydralazine,* hydrochlorothiazide,* hydroxychloroquine, hyoscyamine, inhaled corticosteroids (<1%), insulin, interferon-alpha, interleukin-2 (5%-6%), isotretinoin, levodopa*(20%-40%), lincomycin,* local anesthetics, losartan, lovastatin, metformin* (3%), methimazole* (6%-38%), MTX (0.5%-3%), methyldopa,* metoclopramide,* metronidazole (12%), NSAIDs* (<1%), nifedipine (9%), nitroglycerin (<1%), opioids, penicillamine* (12%-35%), pentamidine (<1%), phenytoin, piperacillin (<1%), procaine penicillin (15%), promethazine (<1%), PTU,* propranolol, rifabutin, scopolamine, spironolactone,* streptomycin, sucralfate,* sulfasalazine, terbinafine, triamterene* (<1%), TCAs (<1%), trihexyphenidyl (<1%), venlafaxine (0.1%-1%), vincristine (<1%)
Dysgeusia	
Bitter	Acetazolamide, amphetamines, aspirin* (1%), carbamazepine (<1%), clarithromycin, 5-fluorouracil (1%-2%), isosorbide nitrates (<1%), lamotrigine, levodopa* (20%-40%), metolazone (<2%), procainamide (3%-4%), risperidone (<1%), sulindac* (<1%)
Metallic	Allopurinol, amphotericin B, beta-lactam antibiotics, botulinum toxin, bupivacaine, captopril* (9%), ceftriaxone, disulfiram* (metallic or garlic taste, 0.1%-1%), eprosartan, ergocalciferol (<1%), ethambutol,* flurazepam, gold salts,* interferon-gamma, iodine, levofloxacin, lithium (<1%), losartan, metformin* (3%), methocarbamol (<5%), methyldopa,* metronidazole (12%), nifedipine (6%), penicillamine,* pentamidine (32%-72%), procaine penicillin, propafenone, sulfasalazine, sulindac* (<1%), terbinafine, tetracycline,* vitamin D, zopiclone
Salty	Captopril* (4.5%), dipyridamole, lamotrigine, lithium (<1%), nifedipine (3%), sulfisoxazole
Sour	Benzocaine
Sweet	Acetazolamide, captopril* (2%), 5-fluorouracil,* furosemide,* nifedipine (2%), sulfasalazine
Nonspecified	Aspirin (1%), ACE inhibitors* (1%-5%, see above for captopril), amlodipine (0.1%-1%), amphetamines (1%-2%), acetazolamide (12%-100%), azathioprine* (<1%), baclofen (<1%), benzodiazepines (>0.1%-1%), bupropion (3%), butorphanol (3%-9%), cephalosporins (<1%), chlorhexidine, chlorthalidone, cimetidine, cisplatin, cocaine (1%-10%), cyclobenzaprine (1%-3%), dantrolene, dexamphetamine (1%-2%), diazoxide, didanosine (1%-10%), diltiazem, doxazosin (0.5%-1%), famotidine (<1%), flecainide (<1%), fluphenazine (<1%), foscarnet (1%-5%), gold salts* (12%), granisetron (2%), idoxuridine (6%), interferon-alpha (1%-13%), labetalol (1%), lincomycin, lomustine, loratadine (<2%), losartan, methimazole* (20%-38%), misoprostol* (<1%), NSAIDs* (<1%), nicotine polacrilex (1%), nitroglycerin, omeprazole, paroxetine (2.4%), penicillamine* (12%-35%), pergolide (1%-2%), pravastatin (<1%), pseudoephedrine (1%), PTU, selegiline, sertraline (1.2%), tetracyclines (<1%), trazodone (1%-2%), TCAs (>0.1%-9%), trifluoperazine, venlafaxine (0.1%-1%), zidovudine (5%)
Parageusia	Dipyridamole
Nonspecified	Alcohol, amiodarone (1%-3%), chlorpheniramine, chlorpromazine, clindamycin, danazol, haloperidol, ipratropium, isoniazid,* loperamide, mexiletine (0.5%), ofloxacin (1%), oxybutynin, phenytoin, ranitidine, sumatriptan (<1%), sulfamethoxazole/trimethoprim, tolbutamide (<1%)
Olfactory disturbance	ACE inhibitors, amiodarone, amoxicillin, amphetamines, beta-blockers, bromocriptine, calcium channel blockers, chlorhexidine, cholestyramine, cimetidine, cocaine, corticosteroids, decongestants, doxycycline, flurbiprofen, gemfibrozil, gentamicin, inhaled corticosteroids, interferon-alpha, interleukin-2, isotretinoin, levodopa, methimazole, MTX, pentamidine, promethazine, PTU, quinolones, scopolamine, statins, streptomycin, sumatriptan, terbinafine, tobacco.

†Incidences are given in parentheses, and should be interpreted with caution since they are sometimes reported as taste/smell disturbances or a combination of various taste disturbances; * related or possibly related to zinc deficiency; ACE = angiotensin-converting enzyme; MTX = methotrexate; NSAIDs = nonsteroidal anti-inflammatory drugs; PTU = propylthiouracil; TCAs = tricyclic antidepressants.

References

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