ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES Knowledge to Innovation

Vol 6, Issue 4, 2013

ISSN - 0974-2441

Review Article

DYSGEUSIA-A REVIEW

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Received: 18 August 2013, Revised and Accepted: 11 September 2013

ABSTRACT

Dysgeusia, is distortion of the sense of taste. It is an abnormality in patient ability to detect the four standard taste stimuli (salt, sweat, sour, bitter) or electric stimuli (electrogustometry). The causes can be drugs, surgery or even idiopathic. In a majority of patients dysgeusia is considered as due to idiopathic causes. A distorted sense of taste can be risk factor for diabetes, stroke, heart disease. The loss of taste can also be sign of degenerative diseases of nervous system such as Parkinson's disease. Taste disorder can cause us to eat too much sugar or salt to make our food better which leads some change in body conditions such as high blood pressure.

Keywords: Dysgeusia, hypogeusia, taste disorder, taste quality.

INTRODUCTION

Dysgeusiadenotes alter sense of taste which can be a manifestation of peripheral or central nervous system. The disorder can present itself as hypogeusia which is loss of ability to detect various tastes. Some experiences intensification of certain taste, referred as taste phantom. Also some complains of metallic taste which is continuous. There can also be complete lack of taste sensation known as Ageusia. [1]. The taste sensation is perceived by three cranial nerves, facial nerve, glossopharyngeal nerve and vagus nerve[2]. The facial nerve perceives taste on the anterior two thirds of tongue and palate, glossopharyngeal is essential for sensation on the posterior third of tongue, oropharynx and pharyngeal mucosa and vagus for the base of the tongue and epiglottis along with general sensation of soft palate and upper pharynx. Apart from these the mandibular branch of trigeminal nerve also plays a role in general sensation in the anterior two third of tongue [2]. The submucosal plexus in the dorsum of the tongue may have sensory and gustatory anastomosis which when affected by any lesion can cause taste abnormality. Dysgeusia can also be categorized as total (to general stimuli), partial (few stimuli), specific(to a single stimuli).There are few other type of alterations in taste like, aligeusia (stimulated dysgeusia) is a distortion or perversion in the perception of taste, phantogeusia (unstimulateddysgeusia) is perception of taste in absence of any recognized taste stimuli which is otherwise known as gustatory hallucination cacogeusia which is bad taste.

ETIOLOGY[3,4,5,6,7,8]

There are numerous local and systemic factors which cause dysgeusia. The local factors can behead injury causing damage to central or peripheral nerve, surgical procedure like tonsillectomy, adenoidectomy, extraction of third mandibular tooth which causes partial or complete nerve transaction, infections like upper respiratory tract infection, maxillary sinusitis herpes zoster, HIV, direct needle trauma due to local anesthesia , neurotoxicity, smoking, radiation therapy for cancer of head and neck, poor oral hygiene and dental problem. Systemic factors include endocrine disorder like diabetes mellitus, hypothyroidism, hypoadrenalism, nutritional deficiency mainly decrease in zinc copper and nickel level, damage to central nervous system like-facial paralysis, multiple sclerosis, thalamic lesion, systemic autoimmune disease, malignancies, nasal polyp. Apart from these factors many drugs do cause a major impact on taste sensation.

Local factor

Head trauma causing damage to central or peripheral nerve can cause dysgeusia.
Surgical procedure causing partial or complete nerve transaction tonsillectomy, adenoidectomy, extraction of third mandibular molar tooth can lead to dysgeusia.
Infection like bacterial infection, viral infection (like upper respiratory tract infection, herpes zoster, HIV), fungal infection, parasitic infection.
Local anaesthesia -direct needle trauma, hemorrhage inside the epineurium, neurotoxicity.
Smoking
Radiation therapy for cancer of head and neck.
Poor oral hygiene and dental problem

Systemic factor

Endocrine disorder- diabetes mellitus, Hypothyroidism, hypoadrenalism
Nutritional deficiency-decrease zinc copper and nickel level
CNS damage-facial paralysis, multiple sclerosis, thalamic lesion,
Systemic autoimmune disease- Systemic lupus erythematos
Nasal polyp

Drug

Anti-rheumatic agents- Penicillamine, levamisole, gold, levodopa
Anti-inflammatory agents- Phenylbutazone, acetylsalicylic acid
Antithyroid agents-Carbimazole, thiouracil
Diuretics and antihypertensive agents-Captopril, diazoxide, ethacrynic acid
Antibiotics-Metronidazole, lincomycin, ethambutol
Anti protozoal drug
Local anaesthesia- lidocaine, procaine.
ACE inhibitor
Calcium-antagonist
Antineoplastic - fluorouracil

CLINICAL ASSESSMENT OF DYSGEUSIA [9,11]

The clinical assessment of a patient complaining of dysgeusia includes:

History

Evaluation of alter in taste and dietary changes, duration, site, initiating, precipitating and relieving factors, associated oral symptoms (e.g. burning sensation, oral dryness).

Medical history

Medical history and drug history are essential to rule out side effect due to drugs. Industrial metallic poisoning to metal like halogen, selenium, chromium should be noted. Other symptoms like suggestive of altered cranial nerve function like head ache, diplopia, seizure, dizziness deafness, muscle weakness, numbness may occur as a result of neoplasm or other lesion of CNS.

Clinical examination

Examinations of cranial nerves VII , IX, X , cervical lymphadenopathy, olfactory testing, testing of trigeminal nerve ,salivary gland enlargement, assessment of oral hygiene, gingival and periodontal health assessment, tonsilitis ,sinusitis and features of long-standing xerostomia, The dorsum of tongue may have coating, should check for the presence of extensive mucosal lesion for lichen planus, leukoplakia, glossitis. The side of tongue, floor of the mouth, mylohyoid area should be examined for lingual branch of nerve V and pharyngeal surface of the tongue for masses that affect the lingual branch of cranial nerve IX.

Testing the ability to taste [10]

Testing is confined to stimulation with four classically defined tastes. This can by asking patient to take sweetness of sugar, sourness of grape fruit juice, bitterness of coffee saltness of potato chips. Mouth wash are used check for whole mouth. Locally tested by applying few drops of solution on the dorsum of tongue by using cotton applicator or small filter paper disks. Tests are available which either assesses the ability to taste in the whole oral cavity (whole mouth test) or in specific regions (regional test). The tests are often carried out by presenting liquid stimuli to the front or back of the tongue.

Taste intensity measurement [12,13]

Quantitative analysis include

Detection threshold

The lowest concentration at which a substance can be distinguish from the water.

Recognition threshold

The lowest concentration at which a substance can be identified by its taste. It is always higher than detection threshold.

Continuous scaling

Presentation of a gradually increasing concentration of the stimulus.

Suprathreshold scaling

It is used to determine of the patient perceived intensity of stimulus increase correspondingly with increase in concentration.

Magnitude estimation

Patient is asked to match each taste stimulus with one of a set of non –gustatory stimuli (auditory tones) comparing the different type of stimuli to assign a range of adjective from "very strong" to "very weak" for each supra threshold stimulus. It is a sensitive indicator of taste loss.

Regional taste (spatial taste) testing [10]

- Psychophysical "Tongue mapping" and spatial distribution of localized taste response:

The four quadrant of the tongue dorsum provide a readily accessible surface for testing right and left also seventh and ninth nerve responses. Anatomical variability may show changes in the result sensitivity for sweet is at the tip, salt on front edges, sour on rear edges, bitter on the back of the tongue, is oversimplified.

- Electro-gustometry

Taste bud field are stimulated by low-voltage anodal and cathodal current applied by means of a battery or line operated hand held instrument referred as electro-gusto meter. Full range of basic tests cannot be done but anodal currents produces sour –metallic sensation and cathode current produces an indistinct bitter-sweet sensation. Tests are available which either assess the ability to taste in the whole oral cavity (whole mouth test) or in specific regions (regional test). The tests are often carried out by presenting liquid stimuli to the front or back of the tongue**.**

LABORATORY TESTING

Test indicated are,
Two hour postprandial blood glucose estimations,
Glucose tolerance test,
Serum triglycerides,
Lipoprotein electrophoresis,
Blood urea nitrogen,
Thyroid function studies.

CRANIOFACIAL IMAGING [14]

CT and MRI helps to diagnose any lesion of intracranial or extracranial along with the course of the taste pathway.

MANAGEMENT

Pharmacologic

The amino acid glutamine has also been investigated as a treatment for dysgeusia. Glutamine's are effective in reducing taste alterations because research supports the use of glutamine in improving mucositis and recovery time in patients receiving high-dose chemotherapy. Zinc gluconate (140 mg/d for 3 months) data is available on the therapeutic effectiveness in both idiopathic disgeusia and zinc deficiency groups [15, 16]. BMS, tricyclic antidepressants (amitryptyline, imipramine) appear to improve the abnormal sensation [17].

Non-pharmacologic

Many times, dysgeusia is treated by treating the cause. Comprehensive history and clinical examination helps in determining causative factors treating them will improve taste disorder.

Patient education is useful to treatment for dysgeusia. If the cause cannot be treated for example, if there is irreversible nerve damage dysgeusia cannot be treated. There is no cure for chemotherapy-induced dysgeusia, only plan to help manage the disorder. Taste alteration varies with each patient and specific suggestions for dysgeusia [18, 19]. Modification of food preparation appears to be only the effective management approach at this time. Hence should avoid the use of metallic silverware, choose more bland food, eat small meals several times a day, drink more water with meals to help with swallowing or rinse away bad taste, should chew food well before swallowing as it help to increases salivary production to further distribute the chemical[20].

CONCLUSION

No pharmacologic agents have been shown to decrease dysgeusia and no evidence-based guidelines have been developed for its management. This will not end up as a local problem but will affect the patients diet pattern , hence, would lead into various nutritional disorder. Therefore, an utmost effort should be taken to prevent complication. Sometimes this could be an indication of another systemic disease. So a wide knowledge about the causes and management is required to help the patient at the earliest.

REFERENCE

1. Samuel K. Feske and Martin A. Samuels, Office Practice of Neurology 2nd ed. (Philadelphia: Elsevier Science, 2003).
2. Netter FH.Atlas of human anatomy, professional edition. 4 ed. Philadelphia: WB Saunders; 2006.

3. Ackerman BH, Kasbekar N. Disturbances of taste and smell induced by drugs. Pharmacotherapy 1997; 17(3):482–96.
4. Scully C, Bagan JV. Adverse drug reactions in the orofacialregion.Crit Rev Oral Biol Med 2004; 15(4):221–39.
5. Spielman AI. Chemosensory function and dysfunction.Crit Rev Oral Biol Med 1998; 9(3):267–91.
6. Gülicher D , Gerlach KL. Sensory impairment of the lingual and inferior alveolar nerves following removal of impacted mandibular third molars.Int J Oral MaxillofacSurg 2001; 30(4):306–12
7. Pogrel MA, Bryan J, Regezi J. Nerve damage associated with inferior alveolar nerve blocks. J Am Dent Assoc 1995; 126(8):1150–5.
8. Queral-Godoy E, Figueiredo R, Valmaseda-Castellón E, Berini-Aytés L, Gay-Escoda C. Frequency and evolution of lingual nerve lesions following lower third molar extraction.J Oral Maxillofac Surg2006; 64(3):402–7
9. Landis BN, Leuchter I, San MillánRuíz D , Lacroix JS, Landis T. Transient hemiageusia in cerebrovascular lateral pontine lesions. J NeurolNeurosurg Psychiatry. 2006;77:680-683.
10. Gudziol H, Hummel T. Normative values for the assessment of gustatory function using liquid tastants. ActaOtolaryngol.2007; 127:658-661.
11. Malcolm A. Lynch, Vernon J. BrightmanMartin S.Geenberg. burketi Oral Medicine diagnosis and treatment.Ed.9,ch.9,p.347-378
12. Deems DA, et al. smell and taste disorder, study of 750 patient from the University of Pennsylnania smell and taste center. Arch otolaryngol head and neck surg.1991;117:519.
13. Lehman C.D., Bartoshuk L.M., Catalanotto F.C., Kveton J.F., and Lowlicht R.A. (1995) Effect of Anesthesia of the Chorda Tympani Nerve on Taste Perception in Humans. PhysiolBehav, 57 (5), 943-951.
14. Cunningham, R. S. (2004). The anorexia-cachexia syndrome.In C. Yarbro, M. Frogge, & M. Goodman (Eds.), Cancer Symptom Management (pp. 137-167). Sudbury, MA: Jones and Bartlett Publishers.
15. Savarese, D. M., Savy, G., Vahdat, L., Wischmeyer, P. E., & Corey, B. (2003). Prevention of chemotherapy and radiation toxicity with glutamine. Cancer Treatment Reviews, 29, 501-513.
16. Heckmann SM, Hujoel P, Habiger S, Friess W, Wichmann M, Heckmann JG, Hummel T. Zinc gluconate in the treatment of dysgeusia – a randomized clinical trial. J Dent Res. 2005;84:35- 38.
17. Barker KE, Batstone MD, Savage NW. Comparison of treatment modalities in burning mouth syndrome. Aust Dent J. 2009; 54:300-305.
18. Mathey M.F., Siebelink E., de Graaf C., and Van Staveren W.A. (2001) Flavor enhancement of food improves dietary intake and nutritional status of elderly nursing home residents. J Gerontol, 56, 200-205.
19. Hong, J. H., Omur-Ozbek, P., Stanek B. T., Dietrich, A. M., Duncan, S. E., Lee, Y. W., & Lesser, G. (2009).Taste and odor abnormalities in cancer patients. The Journal of Supportive Oncology, 7, 58-65.
20. Rehwaldt M., Wickman R., Purl S., Tariman J., Blendowski C., Shott S., &Lappe, M. (2009). Self-care strategies to cope with taste changes after chemotherapy. Oncology Nursing Forum, 36, E 47-56.