

Dentin Hypersensitivity: The Common Cold of Dentistry

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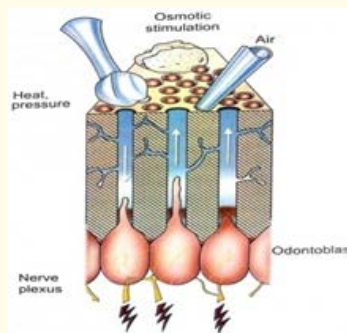
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Tooth sensitivity is a very common and peculiar clinical problem which can cause considerable concern for the patient as well to dentist. It is “an enigma” frequently encountered, not well understood and poorly treated. Management of such a condition requires a good understanding of the complexity of the problem as well as the variety of treatment modalities available. The Canadian Advisory Board in 2003 gave a valid definition of dentin hypersensitivity, as “Short, sharp pain arising from exposed dentin, in response to stimuli typically thermal, evaporative, chemical, tactile or osmotic and which cannot be ascribed to any other form of dental defect or disease.” Myelinated A fiber seems to be responsible for dentin sensitivity. The problem of dentin hypersensitivity occurs in wide range of population from 4-74%. The teeth most commonly affected are canines and premolars.

The hypersensitivity of dentin according to Brännström’s hydrodynamic theory states that stimuli create a pressure change or disturbance within the fluid that fills the dentinal tubules. The movement of the fluid in the open tubules is then transmitted to the A-delta nerve fibres. Heat, cold, air, and pressure can cause this rapid movement of fluid in open dentin tubules. Cold stimuli will cause the fluid in the tubules to contract while heat stimuli will expand the fluid, both of which will cause a notable pressure change within the tubules thereby giving a short, sharp pain sensation.



Dentinal hypersensitivity can have multiple etiologies. It is important that the patient’s medical and social history, lifestyle, medications and supplements being taken, diet and food habits, and oral hygiene be thoroughly reviewed. Before making a diagnosis of dentinal hypersensitivity, other oral conditions, including occlusal trauma, caries, defective restorations, fractured or cracked teeth, potential reversible or irreversible pulpal pathology, or gingival conditions must be ruled out.

The clinical presentation of dentin hypersensitivity is much variable. The pain arising from sensitivity is extremely variable in character, intensity ranging from mild discomfort to extreme severity; the degree of pain varies in different teeth and in different persons. It may

emanate from one tooth or several teeth and it is sometimes felt in all quadrants of the jaws. Most patients describe the pain arising from dentinal hypersensitivity as being rapid in onset, sharp in character and of short duration. The pain is intensified by thermal changes, sweet, sour, scratching the dentin.

Recommended actions for preventing dentin hypersensitivity given by Drisko include:

- Suggestions for patients are avoid using large amounts of dentifrice or reapplying it during brushing, avoid medium- or hard-bristle toothbrushes, avoid brushing teeth immediately after ingesting acidic foods, avoid brushing teeth with excessive pressure or for an extended period of time, avoid excessive flossing or improper use of other interproximal cleaning devices, avoid “picking” or scratching at the gumline or using toothpicks inappropriately.
- Suggestions for dental professionals are, avoid over-instrumenting the root surfaces during scaling and root planning particularly in the cervical area of the tooth, avoid over-polishing exposed dentine during stain removal, avoid violating the biological width during restoration placement, as this may cause recession, avoid burning the gingival tissues during in-office bleaching, and advise patients to be careful when using home bleaching products.

Many modalities have been suggested to treat dentin hypersensitivity depending on the degree of sensitivity. Generally, they can be divided into:

1. ‘In-office’ i.e. intended to be applied by a dentist or dental therapist.
2. ‘At home’ treatments i.e. available over-the-counter or by prescription.
3. Over-the-counter (OTC) treatments for sensitive teeth can be the most cost-effective means to relieve sensitivity, and many people make the decision to self-medicate with desensitizing toothpastes. The most popular desensitizing ingredient in toothpastes is 5% potassium nitrate (Sensodyne®, GlaxoSmithKline; Colgate® Sensitive and Colgate® Sensitive Enamel Protect™, Colgate-Palmolive; Crest® Sensitivity, Procter & Gamble). Now days the use of ‘bioglass’ in management of hypersensitivity has been shown by some products such as NovaMin (NovaMin Technology Inc., FL, USA). This product crystallizes to build a new hydroxyapatite layer over the exposed dentin and within the tubules.



In office treatment may include application of dental sealants, which includes resin-based materials. 05% sodium fluoride varnish (Duraphat®, Colgate-Palmolive, New York, NY) painted over exposed root surfaces has been shown to be an effective treatment for dentinal hypersensitivity. An aqueous solution of glutaraldehyde and hydroxyethylmethacrylate (HEMA) (Gluma Desensitizer, Heraeus-Kulzer; Calm-It™, Dentsply-Caulk) has been reported to be an effective desensitizing agent for up to nine months. The mechanism for tubule occlusion appears to be due to the glutaraldehyde. The use of oxalates has also been shown to be effective, with the oxalate precipitating and occluding the open dentinal tubules. Recently, a novel oxalate strip has been introduced as a targeted treatment that provides immediate and durable relief. (Crest Sensi-Stop Strips, P&G).



Biodentine is a calcium-silicate based material that has drawn attention in recent years and has been advocated to be used in various clinical applications, such as root perforations, apexification, resorptions, retrograde fillings, pulp capping procedures, and dentine replacement. Biodentine has been recently used to seal the dentinal tubules which prevent sensitivity in many patients.

A more recent approach to the management of dentinal hypersensitivity is Tooth Mousse, which is a unique combination containing amorphous calcium phosphate (ACP) and casein phosphopeptide (CPP) obtained from milk casein. These are Simple to apply by just rubbing it lightly over the teeth with finger or soft brush. They are applied for 2-3 mins. Apply in the evening after cleaning the teeth or before going to bed has proven more effective.

Fluoride iontophoresis reported to provide long-term relief from hypersensitive dentin. Iontophoretic fluoride desensitization occurred by two mechanisms: The intratubular micro precipitation of CaF_2 affecting dentine permeability and an effect of fluoride on the neural transduction mechanism. Unit has a Positive electrode is placed on patients face or arm and Negative electrode is a tip placed around the tooth. It is use with 2% sodium fluoride.



The Neodymium-dopedyttrium aluminum garnet (Nd: YAG) has been used successfully to treat dentin hypersensitivity. The advantages of this treatment are - Quick response with few side effects, simple and fast to administer, consistent and reproducible effect, less traumatic procedure and well accepted by patients and high success rate.



Surgical correction of gingival recession leading to root coverage has also shown remarkable results.

Dentin hypersensitivity is very common and complex dental problem and clinicians must take a detailed history, adapt to novel and new technology to resolve the problem. Professionals should identify the causative factors as prevention is undoubtedly the best treatment plan.

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