

Dentinal Hypersensitivity: An Overview, Pathogenesis and Management of Dentinal Hypersensitivity

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ABSTRACT

Dentinal hypersensitivity might be one of the most common dental complaints encountered in our day to day practice. Although being so prevalent and a discomforting dental issue which affects the patient's well being physically, mentally and in dietary choices, there are no said guidelines and treatment procedures especially designed for treating dentinal hypersensitivity. There are a few theories trying to explain the pathophysiology of the dentinal pain or dentinal hypersensitivity, although the hydrodynamic theory is the most accepted one.

There have been a number of desensitizing agents, desensitizing toothpastes and mouthwashes, which can relieve sensitivity to an extent but cant be prescribed as a long term treatment planning in cases of extreme hypersensitivity. In this review article I will try to bundle up the pathogenesis, causes, treatment and management of dentinal hypersensitivity.

Keywords: dentinal hypersensitivity, management, etiology, desensitizing agents

INTRODUCTION

Dentinal hypersensitivity is a condition mainly caused due to the exposed dentinal tubules^{1,2,3,6}. It presents as sharp acute pain when the tooth or the affected area is exposed to external stimuli like extreme hot, cold or sweets⁴. Depending upon the site of dentin loss it can be referred to as dentinal hypersensitivity/ dental hypersensitivity/ root hypersensitivity/ cervical sensitivity. However, these terms are used interchangeably^{3,6}.

Etiology and pathophysiology of dentinal hypersensitivity:

Although the exact reason behind hypersensitivity is yet to be explained, the most accepted theory for dentinal hypersensitivity is the fluid movements in hydrodynamic theory^{1,6}. According to studies, a total number of 30,000 living cells are damaged per 1mm² of dentin exposure. According to the hydrodynamic theory of pain transmission by the odontoblasts, there are fluid movements either inwards due to cold stimuli or outwards due to drying of exposed dentinal tubules, which in turn causes mechanical disturbances of the nerves closely associated with the odontoblasts and its processes².

Clinically presenting cases of Hypersensitivity shows:

1. Dental caries¹.
2. Reduced enamel thickness¹.
3. Hypomineralisation developmental defects like dentinogenesis imperfecta/ amelogenesis imperfecta.⁸
4. Fluorosis.^{9,10}

5. Iatrogenic dental sensitivity post scaling or root planing.¹¹
6. Tooth surface loss due of abrasion, abfraction, attrition or erosion.^{1,3}

The most common prevalent factors associated with dentinal hypersensitivity can be faulty tooth brushing techniques, tooth positions, faulty occlusion, underlying periodontal issues, dietary choices like increased acidic food and drinks intake.^{16,1,3,18} Saliva also plays a crucial role in developing dentinal hypersensitivity.¹⁷

MANAGEMENT

Management of dental hypersensitivity differs from patient to patient, cases to cases depending upon the etiology.

The strategies for management can be simply classified as

- Behavioral changes
- Restorative treatment
- Non invasive management
- Oral hygiene instructions as preventive measures¹

In cases of dentin exposure in dental caries and cases of abrasion and abfraction restoration with the suitable dental material is sufficient to treat dental hypersensitivity.¹

In cases of moderate and severe erosion, attrition and some cases of developmental anomalies of dentinogenesis imperfecta or amelogenesis imperfecta, providing with dental crowns and onlays depending upon the cases can be beneficial and can relieve the patient from discomfort and improve their quality of life.^{14,17}

In other cases, such as fluorosis caused by environmental factors, moderate erosions, reduced enamel thickness (generally in lingual side of lower anteriors) treating dental hypersensitivity becomes tricky and no universally accepted guidelines have been laid down in our textbooks so far. However, several studies have found that bonding agents have been of great help.^{1,17}

The most recent studies have shown the effect of occluding the exposed dentinal tubules by cyanoacrylates as the most effective management of dental hypersensitivity. First termed by Pashley et al in the 1990's, a procedure as "prehybridization/ dual bonding technique" and resin coating technique were established with the term IDS (Immediate Dentin Sealing). Immediate dentin sealing is basically done post crown preparations, to avoid post-op sensitivity. Also, this procedure can be done as a post-op procedure in patients with already existing sensitivity to avoid further discomfort.^{19,20}

There are studies which have shown cow milk as a desensitizing agent. Instructing patient to rinse with milk post periodontal therapy has shown to reduce dentin hypersensitivity to a great extent by day 10th or 15th.¹² In fact it is seen that milk is not only as effective as 3% KNO₃ desensitizing agent, but also it is an easier and cheaper alternative to postoperative hypersensitivity.^{12,13,15}

The other management of dental hypersensitivity includes use of Nd-YAG Lasers. Laser therapy was first introduced for the treatment of dental hypersensitivity in the year of 1985.²¹

CONCLUSION

Depending upon the cases, time management and the cost effectiveness there are several treatment procedures for the management of dentinal hypersensitivity. The self-management includes behavioral alterations, correct brushing techniques, elimination of acidic foods and beverages and in office management includes restorative treatments, surgical and non-surgical hard tissue and soft tissue

corrections,¹ occluding the exposed dentinal tubules by dentin bonding agents and lasers.

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