Recent trend in management of Dentin Hypersensitivity

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Introduction

Dentin hypersensitivity:

- As short, sharp pain arising from exposed dentine typically in response to chemical, thermal or osmotic stimuli.

Dentine sensitivity (DS) or dentinal hypersensitivity (DH) is one of the most commonly encountered clinical problems.
Definition

Hipersensitifitas Dentin

“Nyeri pendek dan tajam pada dentin yang terbuka sebagai respon dari rangsang thermal, evaporative, tactile, osmotic atau chemical yang tidak dapat disamakan dengan bentuk kelainan atau patologis lainnya.”

What causes dentine hypersensitivity?\textsuperscript{1,2}

- **Tooth wear**
  - Abrasion, attrition, erosion

- **Exposed dentine\textsuperscript{1,2}**

- **Gingival recession**

**Who’s at risk?\textsuperscript{3}**

Causes of Dentine Hypersensitivity

- Dentine is covered by enamel and by a protective layer cementum in the tooth root.
- It contains many thousands of microscopic tubular structures.

Diameter of dentinal tubules are typically 0.5-2 microns, in containing plasma-like biological fluid that is connected to the pulp.
Etiologic factors of dentine hypersensitivity

- Incorrect tooth brushing:
  - Gingival Recession
- Dental erosion.
- Abfrasion
- Bleaching

- Parafunzional behaviours - Tooth grinding
- Over consumption acidic food and drink
- Anatomy of dentine pulp complex. (Orchardson R, Cadden SW. 2001)
GINGIVAL recession AND Dentin hypersensitivity
Loss of enamel, it’s includes:
Attrition, abrasion, erosion or afraction, gingival recession, tooth preparation for crown, excessive flossing. [Dababneh, R, 1999]
Dentin sensitivity/dentin hypersensitivity

- It is clinically described as an exaggerated response to application of a stimulus to exposed dentine.
  - Short and sharp toothache.

Pulp inflammation

- A longer duration of pain response.
- True hypersensitivity can develop due to pulpal inflammation.
- Can present the clinical features of irreversible pulpitis, i.e., severe and persistent pain.
Prevalensi

1 dari 3

Orang menderita hipersensitifitas dentin, kebanyakan penderita memiliki rentang usia 20 – 50 tahun.¹

Masih banyak pasien yang tidak tahu 52% Penderita gigi sensitif tidak bertanya kepada dokter gigi dan ≥75% belum pernah menggunakan pasta gigi sensitif karena:

- Takut menderita penyakit yang lebih serius
- Dianggap tidak penting
- Tidak ada waktu ke dokter gigi
- Banyak kepentingan lainnya.
- Membuat strategi untuk beradaptasi terhadap sensitifitas.

Teeth involved

- The canines and first premolars are the most affected teeth, followed by the incisors and second premolars.
- The molars are the teeth least affected by DS.
- The majority of hypersensitive dentine surfaces were present on the facial surface of the teeth.
Sensitifitas dapat mempengaruhi kualitas hidup

Hipersensitifitas dentin dapat memiliki pengaruh yang besar pada kualitas hidup beberapa pasien anda, dan jika didiamkan dapat terjadi perubahan perilaku:¹,²

- Tidak menghiraukan kebersihan mulut
- Tidak mengikuti instruksi kesehatan gigi dan mulut
- Menghindari kunjungan ke dokter gigi
- Mengubah pola makan

Management Of Dentin hypersensitivity

- Identification and diagnosis.
- Differential diagnosis.
- Management principles.
- Direct treatment of dentine hypersensitivity.
- The assessment of pain relief outcome.
- Home use or professional treatment.
Identification And Diagnosis

Initial history and examination include routine screening for DH.

- Careful visual examination for exposed dentine.
  - With 3 in 1 spray to give evaporative or cold air.
- With a tactile stimulus using a sharp dental probe.
- Diagnostic tests including radiographs, may also be required to exclude other conditions.
Differential diagnosis

- Definitive diagnosis of DH as the cause of dental pain may require more than one dental visit.

- There are many causes of pulpitis which are not DH.

These pathologies include:

A. Dental Caries
B. Cracked Teeth
C. Fractured Teeth
D. Post-Treatment Dental Pain
   (Some Bleaching Treatments and Composite Placements)
Reducing Dentin Hypersensitivity With a Tooth Paste - Sensitive Teeth in Cosmetic Category
• The Sensitivity Tooth Paste category to treat Dentin Hypersensitivity has been commonly used for people experiencing sensitive teeth.

• The public advocacy has created a relevance to the condition by adopting a local vernacular term for sensitive or ngilu (Indonesia)/ngilo (Philippines) in the communication.

  **Membantu Mengurangi rasa ngilu akibat gigi sensitif**

• The sensitivity tooth paste in ASEAN market is comply with ASEAN Cosmetic Documents Appendix III - ASEAN Cosmetic Claims Guidelines.
Tooth Paste for Sensitive Teeth based on ASEAN directive (Appendix III)

Membantu Mengurangi rasa ngilu akibat gigi sensitif

Identification of cosmetic product

<table>
<thead>
<tr>
<th>Decision Process to Identify Cosmetic/Allowable Claims</th>
<th>Description of the Process</th>
<th>Review for The Sensitivity Tooth Paste</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Ingredients</td>
<td>Does the product contain only ingredients permitted by the ACD and no ingredients banned by the ACD?</td>
<td>The product only contains ingredients that comply with the annexes of the ASEAN cosmetics directive and does not contain any banned ingredients (Article 4).</td>
</tr>
<tr>
<td>b) Target site of the application</td>
<td>Is the product intended for contact with the various external parts of the human body (epidermis, hair system, nails, lips and external genital organs) or with the teeth and the mucous membranes of the oral cavity?</td>
<td>The product is intended to be placed in contact with the teeth. The product will also contact the mucous membranes of the oral cavity in accordance with the ASEAN Cosmetics Directive (Article 2). -See appendix 1 for instruction for use</td>
</tr>
<tr>
<td>c) Intended main function</td>
<td>Is the product intended exclusively or mainly to clean, perfume, change the appearance and/or correct body odours and/or protect or keep the defined parts of the human body in good condition?</td>
<td>The primary function of a toothpaste is to clean teeth and help with good oral health. The claim of “ngilu-twinge of pain for dentinal sensitivity can be considered as a secondary claim</td>
</tr>
</tbody>
</table>

Membantu Mengurangi rasa ngilu akibat gigi sensitif
CLASSIFICATION OF DESENSITIZING AGENTS

On the basis of mechanism of action

Nerve desensitization

- Potassium nitrate
- Protein precipitation
- Gluteraldehyde
- Silver nitrate
- Zinc chloride
- Strontium chloride hexahydrate
Desensitising Dentifrices

- Desensitizing dentrifices widely indicated due to low cost, ease of use, home application.

- Blocking of dentinal tubules:
  - Physical obliteration
    - Calcium phosphate abrasives
  - Organic precipitation
    - Strontium Chloride
    - Nerve desensitisation
  - Potassium nitrate
Plugging dentinal tubules

- Bio active glasses (SiO₂-P₂O₅-CaO-Na₂O)
- Sodium fluoride
- Stannous fluoride
- Strontium chloride
- Potassium oxalate
- Calcium phosphate
- Calcium carbonate
Direct Treatment Of Dentine Hypersensitivity

- Nerve Desensitisation
  Potassium nitrate (5%) or chloride.

- Blocking the Tubules
  A wide variety of precipitation agents have been suggested.
The first approach is to interrupt the neural response to pain stimuli.

To occlude open tubules to block the hydrodynamic mechanism.
Tubule Blockage Systems

- Biological and logical approach to management of DH.
- The blockages can be readily formed but equally readily be lost unless they are resistant to dietary acidic challenge.
Professional use and self-applied products.

- Home care: desensitising toothpastes containing such as Novamin. (calcium sodium phosphosilicate bioactive mineral) → is a particulate bioactive glass for remineralisation of teeth. (Martin Grootveld, et all 2009)

Bioactive and biocompatible glasses which are known to induce osteogenesis in physiological systems, and occlude tubules.


NovamIn® adalah calcium sodium phosphosilicate

Gambar real time STEM dari serbuk NovamIn® murni yang terdekomposisi dalam air¹

Panah biru menunjukkan area yang menunjukkan pembentukan material baru seiringan dengan pecahnya NovamIn®.


NovaMin® di bidang kedokteran gigi

NovaMin® adalah teknologi pendistribusian ion kalsium dan fosfat.
- Membantu pembentukan lapisan serupa hidroksiapatit diatas dentin yang terbuka dan di dalam tubuli dentin.¹⁻⁵

Saat berkontak dengan saliva, NovaMin®
- Meningkatkan pH saliva⁶,⁷
- Menyediakan suplai ion kalsium dan fosfat ke dalam saliva²,⁸,⁹

The layer builds up over 5 days

Studi *in vitro* menunjukkan bahwa lapisan serupa hidroksiapatit mulai terbentuk pada hari pertama penggunaan dan terus terbentuk selama 5 hari.\(^1,2\)

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
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</table>

**Low mag**
~ x2500

**High mag**
~ x10000

Application: supersaturated Novamin solution in artificial saliva (no brushing)

Home Management with Desensitising Toothpaste is considered by many as the "first option" recommendation.

It is effective but often takes 4 to 8 weeks for pain relief.
Connective tissue graft
conclusion

- Identification of Dentin Hypersensitivity.
- Differential Diagnosis.
- Treatment Plan.
Terima kasih