

## Clinical Assessment Of Bonding Agent v/s Fluoride Varnish In Dentinal Hypersensitivity

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### ABSTRACT:

**Objective:** To compare the mean reduction in pain scores between Bonding agent (GLUMA® Comfort® Bond+ Desensitizer, and Fluoride varnish.

**Methodology:** The study was conducted at Operative Dentistry, Department at Altamash Institute of Dental Medicine, Karachi from July 2015 to August 2016. Total 152 patients were selected. Patients were randomly allocated into two groups A and B. Gluma comfort bond plus desensitizer® was applied to the patients in group A and Duraphet® was applied to the patients in group B. Initial assessment was done after the application of the above products and thermal test was performed. The outcomes were based on a Visual Analogue Scale (VAS). Re-Evaluation was done again after 30 days of treatment in terms of mean reduction in pain from baseline by applying thermal test on visual analogue scale.

**Results:** The average age of the patients was 37.4 ±8.38 years. After 30 days, mean Visual Analog Scale was significantly low in Group A i.e. 2.95±0.0.86 as compared to Group B i.e. 4.01±0.79(p=0.0005). Significant more reduction in mean pain score was observed in Bonding agent (Gluma desensitizer) as compared to Fluoride varnish Duraphat.

**Conclusion:** In our study we found that bonding agent ( Gluma Desensitizer) is more effective in treating Dentine Hypersensitivity compared to fluoride varnish (Duraphat desensitizer group).

**Key Words:** Dentin hypersensitivity, Pain score, Bonding agent, Fluoride varnish.

### INTRODUCTION:

Dentinal hypersensitivity is becoming more and more common these days. It can be diagnosed as short and sharp pain from exposed dentine in response to tactile, evaporative, chemical or thermal stimuli<sup>1</sup>. It is associated with condition like abrasion, attrition, erosion, abfraction, gingival recession and improper brushing habits<sup>2,3</sup>. Most common teeth are canines followed by first premolars, incisors, second premolars, and molars<sup>4,5</sup>. To explain dentinal hypersensitivity many theories has been proposed<sup>3,4,8</sup>. Most authentic theory is hydrodynamic theory of sensitivity. This theory proposed that fluid move rapidly within the dentinal tubules following stimulus application resulting in stimulation of sensory nerves in the pulp/inner dentin portion of the tooth<sup>3</sup>. According to one study, deficiency of cementum (CEJ) in 5% to 10%

of teeth also resulted in exposed dentin and may contribute to dentinal hypersensitivity<sup>6</sup>. Moreover gingival recession, improper tooth brushing or periodontal therapy can also contribute to dentinal hypersensitivity<sup>2-8</sup>. Dentinal hypersensitivity can also be the result of scaling and root planning. The rationale of this study is to identify which treatment modality (Bonding agents or Fluoride varnish) gives better outcome in treating Dentine Hypersensitivity.

### METHODOLOGY:

The study was conducted at Operative Dentistry Department at Altamash Institute of Dental Medicine, Karachi from July 2015 to August 2016. A total of 152 patients was selected by eligibility criteria.

Patient with history of dentinal hypersensitivity having cervical erosive cavities and gingival recession were included in the study. Patient should have at least 20 natural permanent teeth and at least two teeth with a VAS score of =4 to be included in the study.

Teeth with caries, defective restorations, chipped teeth, deep periodontal pockets (probing depth >4mm), periodontal surgery within the previous six months, and subjects with orthodontic appliances or bridge work that would interfere with evaluation were excluded. Presence of occlusal overload or occlusal adjustment, any gross oral pathology, eating disorders, chronic disease were also excluded from the study sample, Patients were divided into two equal sized, random groups by lottery method. Gluma comfort bond plus desensitizer® (HeraeusKulzer, Hanau, Germany) was applied to the patients in group A, while Duraphat® (Colgate Oral Pharmaceuticals, New York) was applied to the patients in

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group B. In group A. Each tooth which was sensitive was cleaned with a polishing paste, rinsed with water and air dried. The Gluma etch gel was applied for 20 seconds. Then it was rinsed, air dried and the tooth surface was moistened by pellets dampened with distilled water. Gluma comfort bond plus desensitizer® was applied using a disposable brush applicator. Another coat was applied and then it was light cured for 15 seconds.

In Group B every target sensitive tooth was cleaned with a polishing paste, rinsed with water and air dried. Disposable brush applicator was used to apply Duraphat®. A second coat was applied after 5 minutes. Patients were recalled after 30 days of the treatment and visual analogue scale was used by applying thermal test.

The data analysis was carried out using SPSS (version 19). Mean and standard deviation was calculated for age, pain score at baseline and after 30 days. Mean reduction in pain score was presented in standard deviation. Frequency and percentage was calculated by gender. T-test was applied to compare the mean reduction in pain score in both groups. Stratification with respect to age and gender was done. Post stratification t-test was applied. The p value = 0.05 was considered to be statistically significant.

**RESULTS:**

Mean age of the patients was 37.4 years. There were 53(34.9%) male and 99(65.1%) female patients (Figure1).

The mean VAS for pain was 7.26±0.57 for group A and 7.29±0.51 for group B at the baseline. Mean difference was not significant between groups at baseline. After 30 days, Mean VAS was significantly low in Group A as compared to Group B [2.95±0.0.86 vs. 4.01±0.79 p=0.0005]. Mean reduction in pain score level of gluma desensitizer was 4.32±0.94 while in duraphet group it was 3.22± 1.02. Significant more reduction in mean pain score was observed in Gluma desensitizer as compared to Duraphet as shown in table 1.

Stratification analysis was also performed and observed that mean VAS reduction was also high in group A as compared to group B for below and equal to 40 years of age patients and above 40 years of age patients as shown in table 2 and 3 respectively. Similarly reduction was also observed in group A for male and female cases as shown in table 4 and 5 respectively.

**DISCUSSION:**

Hypersensitivity of dentine is very unpleasant experience perceived by patients. It is a highly painful activity resulting in unusual habits like tongue protecting sensitive teeth, avoidance in eating from that side of the mouth and complete elimination of cold hot and drink and food. The quality of life is greatly compromised. It's difficult for the patient to describe the condition and similarly very difficult to diagnose the exact cause and subsequent management<sup>2</sup>.

The cause of dentinal hypersensitivity may be hot and cold

stimulus. Tactile sensation and evaporation can also result in increasing hypersensitivity<sup>9,10</sup>. Since 1935 –Grossmann

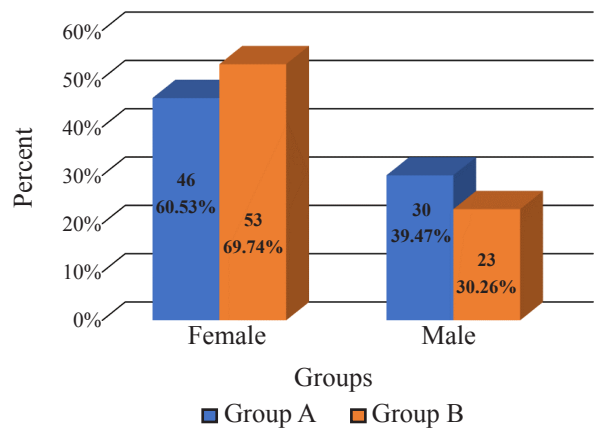


Figure 1: Gender Distribution of the Patients With Respect To Groups (n=152)

Pain Score at different time	Group A n=76	Group B n=76	P-Value
At Baseline	7.26±0.57	7.29±0.51	0.76
After 30 days	2.95±0.0.86	4.01±0.79	0.0005
Reduction in pain score	4.32±0.94	3.22±1.02	0.0005

Table 1: Comparison of Mean Pain Score between Groups Independent sample t test

Pain Score at different time	Group A n=48	Group B n=59	P-Value
At Baseline	7.29±0.62	7.27±0.48	0.84
After 30 days	2.96±0.0.96	4.02±0.0.84	0.0005
Reduction in pain score	4.33±1.07	3.22±1.08	0.0005

Table 2: Comparison of mean pain score between groups for age = 40 years of age Independent sample t test

Pain Score at different time	Group A n=28	Group B n=17	P-Value
At Baseline	7.21±0.49	7.35±0.61	0.41
After 30 days	2.93±0.66	4.00±0.61	0.0005
Reduction in pain score	4.29±0.65	3.24±0.83	0.0005

Table 3: comparison of mean pain score between groups for age above 40 years of age Independent sample t test

Pain Score at different time	Group A n=30	Group B n=23	P-Value
At Baseline	7.10±0.31	7.13±0.34	0.73
After 30 days	2.97±0.99	3.78±0.60	0.001
Reduction in pain score	4.13±1.07	3.26±0.75	0.002

Table 4: comparison of mean pain score between groups for male patients  
Independent sample t test

Pain Score at different time	Group A n=46	Group B n=53	P-Value
At Baseline	7.37±0.68	7.36±0.56	0.93
After 30 days	2.93±0.77	4.11±0.0.84	0.0005
Reduction in pain score	4.43±0.83	3.21±1.13	0.0005

Table 5: comparison of mean pain score between groups for female patients  
Independent sample t test

developed a agent to treat dentinal hypersensitivity, which is non irritant, easy to use, gives immediate result , relatively cheap with long term effect . A review by Markowitz and Pashley proposed that new desensitizing agent should treat the root causes with managing sensitivity as well<sup>11</sup>.

In this study 152 patients were divided into two groups A and B. There were 53(34.9%) male and 99(65.1%) females. Our data shows that women are more vulnerable to hypersensitivity of dentine .A hypothesis was given that female visits the dentists more often and follow hygiene instructions more often than males<sup>12,13</sup>. In our study age of the patients ranges from 20-60 years and the average was 37.4 ±8.38 years. A similar study by Cummins who demonstrated that, dentine hypersensitivity can present at any age but the majority of individuals range in age between 20 and 50 years with a peak in prevalence in the age range 30-39 years.<sup>[14]</sup>

In our study Gluma comfort bond plus desensitizer was applied to the patients in group A and Duraphat was applied to the patients in group B. The mean VAS for pain was 7.26±0.57 for group A and 7.29±0.51 for group B at the baseline. Mean difference was not significant between groups at baseline. After 30 days, mean VAS was significantly low in Group A as compared to Group B [2.95±0.86 vs. 4.01±0.79 p=0.0005]. Mean reduction in pain score level of gluma desensitizer was 4.32± 0.94 while in Duraphet group it was 3.22± 1.02. Significant more reduction in mean sensitivity score was noted in Gluma Desensitizer when we compared it to Duraphet. Gluma contains glutaraldehyde

which occludes dentinal tubules and develops coagulation inside the dentine tubules, because of precipitation of serum albumin<sup>15,16</sup>. Studies outcomes show a mark decrease in dentine hypersensitivity<sup>17,18,19</sup>, but other studies contradict these results<sup>20,21</sup>. Aranha et al.<sup>22</sup> in his study concluded that an instant effect was seen after application of Gluma Desensitizer and Seal & Protect. Fluoride compound application in higher concentration can reduce dentinal hypersensitivity which might be due to deposition of calcium fluoride globules within the dentine tubules<sup>23</sup>. Ghaffar et al concluded in their research that, professionally-applied high-fluoride products, including fluoride varnish (22,600 ppm fluoride) have been shown to greatly reduce dentine hypersensitivity following just one application<sup>24</sup>.

### CONCLUSION:

Clinician find dentinal hypersensitivity very challenging to treat effectively. Patient education regarding managing this condition is of prime importance. With newer materials better option are available to treat the patient but to identify the real cause is of utmost importance in long term success. In our study we found that group in which bonding agents were used was more effective with a mean reduction in pain score level of 4.31± 0.94 while in the group which used fluoride varnish group it was 3.22± 1.02. A good clinician should have sound knowledge of latest materials available to treat the condition of dentinal hypersensitivity.

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