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# EFFECT OF MOUTH WASH ON COLOUR STABILITY ON COMPOSITE RESINS

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**Abstract:**
Introduction: Tooth colored restorations are used widely to meet the esthetic demands of the patients. There are various types of composited manufactured by different companies. These composites have different physical properties in which one of the main factor is color stability. Oral cavity in addition to several factors mayaid in the change of the color stability in which one of the factor is mouth wash. Mouthwash is a liquid which is held in the mouth passively or swilled around the mouth. Nowadays mouth wash use have been increased widely among urban culture. However some mouth washes have a disadvantage of discolouring the composites. Mouthwash can be used either for treatment purpose or for maintenance purpose.
Aim: To study the role of mouth wash in maintaining the color stability of composites.
Materials and methods: A direct composite resin- Nanoceram bright flow of A1 shade was used for the study. Totally eighteen cylindrical test samples were made.(10mm*2mm in dimension) for the study. Samples were build by placing smaller increments and was cured with LED curing light for 20 seconds for each increments.. The specimens are stored in saline to maintain its moisture content for 24 hours. The study was conducted for 7 days. The specimens were randomly divided into three groups. Distilled water-control, mouthwash 1-chlorohexidine and mouthwash-2 Listerine were used for the study. Each day the specimens were immersed in the experimenting solution for 2 minutes and the calorimeter value was taken. The statistical analysis was done in SPSS software.
Results: All samples displayed color changes after immersion, and there was a statistically significant difference among mouth rinses, however the change was not visually perceptible. Distilled water>mouth wash 2> mouth wash 1 descending change of the optical density.
Conclusion: This study concludes that there is a change in the color of composite resin which depends on the mouth wash used with respect to the optical density.

**Key Words:** Mouth Rinse, Comosite, Colour Stability & Optical Density

## Introduction:

Tooth colour restorations have increased with rise in the era which gives importance to the aesthetic appearance. It have become very common nowadays. Tooth-colour restorative materials have beencontinuously evolved to meet patients aesthetic demands in dental practice[1].Different types of composites have been introduced with different physical properties based on size, composition, colour and fillers.One desirable property of composite resin is color stability. Discoloration of tooth-colour, resin-based materials may be caused by two factors- intrinsic and extrinsic. Intrinsic factors involve the discoloration of the resin material itself, such as alteration of the resin matrix and changes in the interface of matrix and fillers. Extrinsic factors include staining by adsorption or absorption of colorants from exogenous sources such as coffee, tea, nicotine, beverages, and mouth rinses.

Oral hygiene plays an important role in achieving the long-term targets of comfort, good function, treatment predictability and longevity of the fixed and removable prosthesis. Mouth washisan chemical solution which is most often used as deodorant and has refreshing and anti-septic property for control of plaque which enables to maintain oral hygiene. Different types of mouth rinses are available commercially like listerine ,chlorohexidine, triclosan, hydrogen peroxide etc.. It can be used either for treatment purpose or for maintenance purpose.

## Aim of the Study:

The aim of this research is to study role of mouth wash in maintaining color stability of composites and to compare the role of various mouth washes on the color stability of composite.

## Methods and Materials:

A direct composite resin-Nanoceram bright flow of A1 shade was used for the study. Totallyeighteen cylindrical test samples were made.(10mm*2mm in dimension) for the study. Samples were made by smaller increments and was cured with LED curing light for 20 seconds. The specimens are stored in saline to maintain its moisture content. The study was conducted for 7 days. The specimens were randomly divided into three groups. Distilled water-control, mouthwash 1- chlorohexidine and mouthwash-2 Listerine are used for the study.

Each day the specimens are immersed in the experimenting solution for 2 minutes and the calorimeter value was taken. The statistical analysis was done in SPSS software.

**Statistical Analysis:**

For each sample, data obtained were subjected to one-way ANOVA and the measurements were compared by the Kruskal-Wallis test, Wilcoxon Signed Ranks Test and NPar test.

**Results:**

Table1 shows the mean value and the standard deviation for distilled water, mouth wash1 and mouth wash 2. The mean optical density of the distilled water is almost consistent when compared to control and all the 7 days. The mean optical density of the mouth wash 1 decreases from control till day 3 and from day 3 to day 7 is consistent. The mean optical density of the mouth wash 2 increases when compared to control and the sampled composite specimens for 7 days. When the mean optical density is compared with each sample-distilled water>mouth wash 2>mouth wash1.

Table 1: shows the statistics in one way – mean value and the standard deviation

| | | N | Mean | Std. Deviation | Std. error | 95% confidence interval for mean | | minimum | maximum |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lower bound | Upper bound | | |
| Control | distilled water | 6 | .1333 | .02887 | .01667 | .0616 | .2050 | .10 | .15 |
| | Mouth wash 1 | 6 | .1400 | .01732 | .01000 | .0970 | .1830 | .12 | .15 |
| | Mouth wash 2 | 6 | .1067 | .01155 | .00667 | .0780 | .1354 | .10 | .12 |
| | total | 18 | .1267 | .02345 | .00782 | .1086 | .1447 | .10 | .15 |
| Day 1 | distilled water | 6 | .0767 | .00577 | .00333 | .0623 | .0910 | .07 | .08 |
| | Mouth wash 1 | 6 | .0567 | .01155 | .00667 | .0280 | .0854 | .05 | .07 |
| | Mouth wash 2 | 6 | .0467 | .01155 | .00667 | .0180 | .0754 | .04 | .06 |
| | total | 18 | .0600 | .01581 | .00527 | .0478 | .0722 | .04 | .08 |
| Day2 | distilled water | 6 | .0833 | .00577 | .00333 | .0690 | .0977 | .08 | .09 |
| | Mouth wash 1 | 6 | .0500 | .00000 | .00000 | .0500 | .0500 | .05 | .05 |
| | Mouth wash 2 | 6 | .0433 | .00577 | .00333 | .0290 | .0577 | .04 | .05 |
| | total | 18 | .0586 | .01900 | .00633 | .0443 | .0735 | .04 | .09 |
| Day3 | distilled water | 6 | .1133 | .03215 | .01856 | .0335 | .1932 | .09 | .15 |
| | Mouth wash 1 | 6 | .0600 | .01000 | .00577 | .0352 | .0848 | .05 | .07 |
| | Mouth wash 2 | 6 | .0667 | .01155 | .00667 | .0380 | .0954 | .06 | .08 |
| | total | 18 | .0800 | .03082 | .01027 | .0563 | .1037 | .05 | .15 |
| Day4 | distilled water | 6 | .1067 | .01155 | .00667 | .0780 | .1354 | .10 | .12 |
| | Mouth wash 1 | 6 | .0733 | .00577 | .00333 | .0590 | .0877 | .07 | .08 |
| | Mouth wash 2 | 6 | .1067 | .01155 | .00667 | .0780 | .1354 | .10 | .12 |
| | total | 18 | .0956 | .01878 | .00626 | .0811 | .1100 | .07 | .12 |
| Day5 | distilled water | 6 | .1067 | .01155 | .00667 | .0780 | .1354 | .10 | .12 |
| | Mouth wash 1 | 6 | .0700 | .01000 | .00577 | .0452 | .0948 | .06 | .08 |
| | Mouth wash 2 | 6 | .1067 | .01155 | .00667 | .0780 | .1354 | .10 | .12 |
| | Total | 18 | .0944 | .02068 | .00689 | .0785 | .1103 | .06 | .12 |
| Day6 | distilled water | 6 | .1133 | .01155 | .00667 | .0846 | .1420 | .10 | .12 |
| | Mouth wash 1 | 6 | .0767 | .01155 | .00667 | .0480 | .1054 | .07 | .09 |
| | Mouth wash 2 | 6 | .1133 | .01155 | .00667 | .0846 | .1420 | .10 | .12 |
| | Total | 18 | .1011 | .02088 | .00696 | .0851 | .1172 | .07 | .12 |
| Day7 | distilled water | 6 | .1233 | .02517 | .01453 | .0608 | .1858 | .10 | .15 |
| | Mouth wash 1 | 6 | .0800 | .01732 | .01000 | .0370 | .1230 | .07 | .10 |
| | Mouth wash 2 | 6 | .1133 | .01155 | .00667 | .0846 | .1420 | .10 | .12 |
| | total | 18 | .1056 | .02555 | .00852 | .0859 | .1252 | .07 | .15 |

Table 2: Shows ANOVA type of statistics

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| control | Between Groups | .002 | 2 | .001 | 2.211 | .191 |
| | Within Groups | .003 | 6 | .000 | | |
| | Total | .004 | 8 | | | |
| day1 | Between Groups | .001 | 2 | .001 | 7.000 | .027 |
| | Within Groups | .001 | 6 | .000 | | |
| | Total | .002 | 8 | | | |
| day2 | Between Groups | .003 | 2 | .001 | 62.000 | .000 |
| | Within Groups | .000 | 6 | .000 | | |
| | Total | .003 | 8 | | | |
| day3 | Between Groups | .005 | 2 | .003 | 6.000 | .037 |
| | Within Groups | .003 | 6 | .000 | | |
| | Total | .008 | 8 | | | |
| day4 | Between Groups | .002 | 2 | .001 | 11.111 | .010 |
| | Within Groups | .001 | 6 | .000 | | |
| | Total | .003 | 8 | | | |
| day5 | Between Groups | .003 | 2 | .001 | 11.000 | .010 |
| | Within Groups | .001 | 6 | .000 | | |
| | Total | .003 | 8 | | | |
| day6 | Between Groups | .003 | 2 | .001 | 10.083 | .012 |
| | Within Groups | .001 | 6 | .000 | | |
| | Total | .003 | 8 | | | |
| day7 | Between Groups | .003 | 2 | .002 | 4.344 | .068 |
| | Within Groups | .002 | 6 | .000 | | |
| | Total | .005 | 8 | | | |

**Discussion:**

Composite resins are restorative material that are mainly used for esthetic purposes which has the advantage of binding with the tooth structure.one critical issue concerned about this material is its color stability. Composite are prone to color change due to intrinsic and extrinsic factors. This colour change is may depend on either the composite material itself or the some extrinsic materials like mouth wash, tea, coffee, beverages etc.. Mouthwash has ben used up by many people nowadays to maintain oral hygiene.mouthwashes are even recommended by doctors for periodontal problems for certain period of time. Many studies have shown the colour change of the composite resin based on usage of different medium like mouth washes, beverages etcc. According to Nairn Wilsonet al ,2014 mouth wasg should be used atleast for 30 seconds twice daily [3].

The present study is evaluated the effects of two commercially available mouth wash on the color stability of commercially available composite. According to the results of the current study use of mouth wash daily increased the staining ability of composite but the color change is not perceivable. In recent years the use of composite resin is used due to the given importance to the esthetic appearances.

A study done by *Cigdem et al* 2008 shows that, effects of the mouth wash on the color change of the materials were not different from that of control solution. All resin restorative materials showed color difference after immersion in tested solutions but these differences were not visually perceptible [1]. The study done by

*Marília Salomão Campos Cabrini FESTUCCIA et al* 2012 stated that color stability actually depends on the composite instead of the mouth wash [2]. *Lee YK et al 2008* studied that after the immersion of composite for 7 days in mouth rinses does not change the color of the composite other than the distilled water [4]. *P. GÜRDAL et al 2002* stated that there is not interaction between the composite material and the mouth rinses with respect to color change that is because of the absence so many properties that are present in the in vivo but difficult to get in in vitro conditions [5]. *FulyaToksoyTopcu et al* 2009 studied the change in coloure stability of the composite resin based on different drinks and the study concluded saying that the red wine used showed major discoloration of the resin and a particular nanosized composite resin used also shoed the least discoloration. This study concludes that the change in the colour stability of a material always depends on both

resin and the material used [6]. *Frank Falkensammer et al 2013* concluded by his stdy that the colourstabilirty of the composite resin totally depend on the different stored soloutionbs as he used red wine, black tea, chlorohexidine, sodium fluoride, tea tree oil, or distilled water for 4 weeks at 37°C. Chlorohexidine mouth wash discolored the materials to a lesser extent with clinically acceptable values [7].

**Conclusion:**

The result of the study concludes that there is a change in the color of composite resin which depends on the mouth wash used with respect to the optical density. Each mouth rinses shows different colour changeable values in the same composite. Many manufacturers should manufacture composite with good color stability.

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