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Effect of four disinfectants on the colour of shade tabs of two different ceramic shade guides: An *in vitro* comparative analysis

Ojasvi Nijhawan, Shreenivas Vasant Bhide and Ajay Sabane

Abstract
Shade-matching process that is consistent is the use of shade tabs from various commercially available shade guides. Shade selection is done intraorally with the help of shade tabs and thus contamination with saliva must be assumed. Therefore, shade tabs must be disinfected after each use. The procedure of subjecting the shade tabs in various disinfectants has been suggested to cause a change in the colour of individual shade tab, resulting in compromised shade matching procedures and contribute to the dissatisfaction of clinicians, technicians, and patients. Hence, this study aims at identifying the effect of four commercially available surface disinfectants: sodium hypochlorite (5.2%) and gluteraldehyde (2%), chlorhexidine gluconate (2%), isopropyl alcohol (70%).disinfectants on the colour of shade tabs of two different ceramic shade guides (Vitapan Classic and Ivoclar Chromascop).

Keywords: shade matching, shade guides, surface disinfectants, spectrophotometer

1. Introduction
Shade determination can be very difficult and complicated because of the subjective and abstract nature of colour [1]. Each tooth has a combination of hue, value, chroma and translucency that varies from the incisal edge to the gingival margin. Shade matching, whether by visual or instrumental methods, requires an understanding of color harmony and tolerance. The CIELAB- defines a color space (L*a*b*) in which L* represents lightness, a* represents the chromaticity coordinate for red-green (+a* is the red direction and −a* is the green direction), and b* represents the chromaticity coordinate for yellow-blue (+b* is the yellow direction and −b* is the blue direction). Color difference, or ΔE, is defined by the following equation:

$$\Delta E = \sqrt{(\Delta L)^2 + (\Delta a)^2 + (\Delta b)^2}.$$

Instruments designed to measure tooth shade in CIE L*a*b* values help to assess color differences using an objective approach. These instruments include spectrophotometers and colorimeters [2]. Shade selection can be accomplished through either visual assessment or instrumental color analysis. Visual shade selection is the most common method of color determination in dentistry, but color duplication via this process is plagued by unreliable and inconsistent results. Instrumental color analysis offers a potential advantage over visual color determination as instrumental readings are objective, quantifiable, and more rapidly obtainable. Generally in dental clinics the shade selection is done intraorally with the help of shade tabs and thus contamination with saliva must be assumed. Therefore, shade tabs must be disinfected after each use. The 2005 OSHA guideline classifies shade guides as semicritical items that can be disinfected with an intermediate level Environmental Protection Agency (EPA)- approved disinfectants namely-2%glutraldehyde,70%isopropyl alcohol, 5.2%sodium hypochlorite, 2% chlorhexidine gluconate et [3]. Most private practioners use shade tabs for colour matching intraorally, and use surface disinfection as the most convenient method to clean shade guides between patients. It is assumed that most private practioners have multiple shade guides and that each one would be used at least twice per day for 5 days per week and for 48 weeks per year. Therefore, each shade tab is disinfected 480 times per year. This number is used as the basis for the number of disinfection cycles per shade tab [1].
This procedure of subjecting the shade tabs of different shade guides for immersion in various disinfectants has been suggested to cause a change in the colour of individual shade tab,

resulting in compromised shade matching procedures and contribute to the dissatisfaction of clinicians, technicians, and patients [4].

Materials and method

A market search was done to find the most commonly used shade guides in dental offices and the two most commonly used were found to be –VITAPAN CLASSIC and IVOCLAR CHROMASCOP SHADE GUIDES,The most commonly used shade tabs were found to be A1,A2,A3,A3.5,B1,B2 from vitapan classic shade guide and 110,120,130,220 and 310 from ivoclar chromascop shade guides respectively. Considering OSHA guidelines, the disinfectants were selected. Each solution was contained in a plastic beaker of the same dimensions on which the name of the disinfectant and duration for which it was immersed was mentioned. (Fig 1)

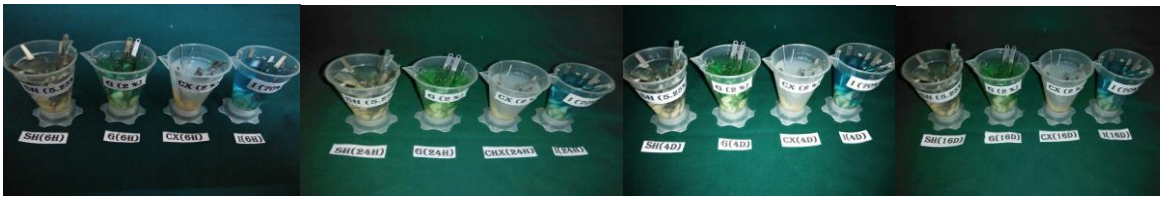


Fig 1

As solutions degrade with time, the depleted solutions were replaced with fresh solutions every day. The selected shade tabs of two different shade guides were simultaneously completely immersed into their respective beakers and were taken out of their solutions at 6 hours, 24 hours, 4 days and 16 days and were gently rinsed and dried by dabbing with a paper napkin. Since every natural tooth and shade tab is polychromatic and every spot on the same shade tab has a different hue, value and chroma; it was necessary that the same spot be measured on each shade tab. This would ensure repeatability of readings and would make possible a meaningful and valid result. For this reason an indigenous device was fabricated, which positioned every shade tab in the same relationship to the spectrophotometer. Hence, a holder made of autopolymerizing acrylic resin to encase the exact dimension of the shade tab, so that the shade tab as well as a certain portion of its handle would friction fit into this holder was fabricated. When the two parts were assembled, it was certain that each time, the sensor of the spectrophotometer would contact and read the same spot on the middle third of every shade tab (figure 2). The spectrophotometric measurements were then performed and the readings were noted.

Fig 2: Vita easy shade spectrophotometer and positioning devise for shade tab

Every reading had an L* a* and b* coordinate, in accordance with the CIE Lab (Commission Internationale de l'Eclairage) colour system. The square root of the sum of the squares of L*, a* and b* values automatically computed by the computer software (VITA Assist software) gave the reading for ΔE. To eliminate variability in the readings, three readings were taken for each shade tab, each time its colour was measured. The average of these three readings for every shade tab was chosen. The data gathered was then subjected to statistical analysis. Paired t-test and unpaired t-test was applied to the observations.

Results and Discussion

Table 1 displays the mean, median and standard deviation of three readings of ΔE for each selected shade tab from two different shade guides at every specified interval of time of immersion in a solution of sodium hypochlorite. The ΔE values at each time interval for each selected shade tab from two different ceramic shade guides were compared with their respective baseline values (before immersion) and the statistical significant differences detected were indicated with the appropriate superscript (*).

Table 1

Vitapan Classic		Delta E				
		Baseline	**6th hr**	**24th hr**	**Day 4**	**Day 16**
A1	Mean	7.67	7.40	7.50	5.70	12.20
	SD	0.06	0.20	0.17	0.20	0.20
	Median	7.70	7.40	7.60	5.70	12.20
	p-value		0.157	0.130	0.005*	0.001*
A2	Mean	6.53	8.03	7.47	6.73	16.50
	SD	0.21	0.21	0.15	0.06	0.10
	Median	6.30	6.10	7.50	6.40	11.80
	p-value		0.023*	0.037*	0.184	< 0.001*
A3	Mean	6.47	6.10	7.20	6.37	11.63
	SD	0.31	0.00	0.26	0.06	0.15

	Median	6.40	6.10	7.10	6.40	11.60
	p-value		0.173	0.148	0.622	0.002*
A3.5	Mean	5.80	6.27	7.00	6.13	11.80
	SD	0.00	0.15	0.36	0.12	0.10
	Median	5.80	6.30	6.90	6.20	11.80
	p-value		0.013*	0.025*	0.300	0.025*
B1	Mean	7.03	6.33	7.17	8.47	9.40
	SD	0.06	0.15	0.21	0.21	0.17
	Median	7.00	6.30	7.10	8.40	9.30
	p-value		0.026*	0.423	0.009*	0.003*
B2	Mean	5.00	6.60	6.83	5.17	13.00
	SD	0.10	0.20	0.51	0.29	0.10
	Median	5.00	6.60	6.70	5.00	13.00
	p-value		0.001*	0.035*	0.444	< 0.001*

IVOCLAR CHROMASCOP		**Delta E**				
		Baseline	**6th hr**	**24th hr**	**Day 4**	**Day 16**
110	Mean	5.33	5.83	9.70	6.07	13.63
	SD	0.06	0.12	0.46	0.32	0.15
	Median	5.30	5.90	9.60	6.20	13.60
	p-value		0.013*	0.004*	0.079	< 0.001*
120	Mean	5.60	7.20	7.77	5.53	15.37
	SD	0.17	0.10	0.23	0.12	0.12
	Median	5.50	7.20	7.90	5.60	15.30
	p-value		0.005*	0.003*	0.529	< 0.001*
130	Mean	5.40	7.17	8.30	4.30	13.13
	SD	0.10	0.21	0.20	0.00	0.06
	Median	5.40	7.10	8.30	4.30	13.10
	p-value		0.007*	0.004*	0.003*	< 0.001*
140	Mean	5.30	5.33	8.03	5.37	14.47
	SD	0.17	0.21	0.42	0.25	0.06
	Median	5.40	5.40	7.90	5.40	14.50
	p-value		0.423	0.015*	0.754	< 0.001*
220	Mean	7.10	6.57	9.43	6.70	12.40
	SD	0.00	0.12	0.06	0.20	0.10
	Median	7.10	6.50	9.40	6.70	12.40
	p-value		0.015*	< 0.001*	0.074	< 0.001*
310	Mean	5.20	4.87	6.33	4.67	13.63
	SD	0.10	0.21	0.06	0.21	0.15
	Median	5.20	4.80	6.30	4.60	13.60
	p-value		0.822	0.003*	0.085	< 0.001*

The American Dental Association (ADA) has set the limit of ΔE 2, as the tolerance for shade guides and ΔE 3.7 as the average color difference between teeth and matched shade tabs in the oral environment. Also Yap *et al* (1999) compared the difference in colour matching between human- eye assessment and computerized colorimetry. They reported that the human eye could detect shade changes when the ΔE value was equal to or greater than 3.00. Based on this study the time at which the colour changed enough to disallow clinical usage (when the mathematical difference between ΔE at that time interval and ΔE control scored 3.00 or above), was noted [5].

A1 showed consistently significant differences at all intervals of immersion compared to the control value with not much difference at 6th hour of immersion. A2 showed significant difference from the control value for almost all time intervals of immersion, but showed no significant difference at the 6th hour and 24th hour after immersion.A3 showed significant differences at 24th hour and 16th day intervals alternating with insignificant differences at other time intervals.A3.5 showed significant difference only at 24th hour interval with the control value.B1 showed significant differences at earlier intervals alternating with insignificant differences at 4th day interval. B2 showed consistently significant difference in ΔE value from the control value for almost all intervals of immersion time except for the 6th hour. 110 showed consistently significant difference in ΔE value from the control value for almost all intervals of immersion time, including a significant difference at the 16th day after immersion.120 and 140 did not show ΔE values that were significantly different from the control values at the 4th day interval.130, 220 and 310 showed significant differences from the 24th hour to the 16th day immersion time with insignificant change at the 6th hour.

Table 2 displays the mean, median and standard deviation of three readings of ΔE for each selected shade tab from two different shade guides at every specified interval of time of immersion in a solution of **korsolex.** The ΔE values at each time interval for each selected shade tab from two different ceramic shade guides were compared with their respective control values (before immersion) and the statistical differences detected were indicated with the appropriate superscript(*),

Table 2

Vitapan Classic		Delta E				
		Baseline	**6th hr**	**24th hr**	**Day4 th**	**Day 16**
A1	Mean	7.67	7.40	7.50	5.70	12.20
	SD	0.06	0.20	0.17	0.20	0.20
	Median	7.70	7.40	7.60	5.70	12.20
	p-value		0.157	0.130	0.005*	0.001*
A2	Mean	6.53	8.03	7.47	6.73	16.50
	SD	0.21	0.21	0.15	0.06	0.10
	Median	6.30	6.10	7.50	6.40	11.80
	p-value		0.023*	0.037*	0.184	< 0.001*
A3	Mean	6.47	6.10	7.20	6.37	11.63
	SD	0.31	0.00	0.26	0.06	0.15
	Median	6.40	6.10	7.10	6.40	11.60
	p-value		0.173	0.148	0.622	0.002*
A3.5	Mean	5.80	6.27	7.00	6.13	11.80
	SD	0.00	0.15	0.36	0.12	0.10
	Median	5.80	6.30	6.90	6.20	11.80
	p-value		0.013*	0.025*	0.300	0.025*
B1	Mean	7.03	6.33	7.17	8.47	9.40
	SD	0.06	0.15	0.21	0.21	0.17
	Median	7.00	6.30	7.10	8.40	9.30
	p-value		0.026*	0.423	0.009*	0.003*
B2	Mean	5.00	6.60	6.83	5.17	13.00
	SD	0.10	0.20	0.51	0.29	0.10
	Median	5.00	6.60	6.70	5.00	13.00
	p-value		0.001*	0.035*	0.444	< 0.001*

Ivoclar hromascop		Delta E				
		Baseline	**6th hr**	**24th hr**	**Day 4**	**Day 16**
110	Mean	5.33	5.83	9.70	6.07	13.63
	SD	0.06	0.12	0.46	0.32	0.15
	Median	5.30	5.90	9.60	6.20	13.60
	p-value		0.013*	0.004*	0.079	< 0.001*
120	Mean	5.60	7.20	7.77	5.53	15.37
	SD	0.17	0.10	0.23	0.12	0.12
	Median	5.50	7.20	7.90	5.60	15.30
	p-value		0.005*	0.003*	0.529	< 0.001*
130	Mean	5.40	7.17	8.30	4.30	13.13
	SD	0.10	0.21	0.20	0.00	0.06
	Median	5.40	7.10	8.30	4.30	13.10
	p-value		0.007*	0.004*	0.003*	< 0.001*
140	Mean	5.30	5.33	8.03	5.37	14.47
	SD	0.17	0.21	0.42	0.25	0.06
	Median	5.40	5.40	7.90	5.40	14.50
	p-value		0.423	0.015*	0.754	< 0.001*
220	Mean	7.10	6.57	9.43	6.70	12.40
	SD	0.00	0.12	0.06	0.20	0.10
	Median	7.10	6.50	9.40	6.70	12.40
	p-value		0.015*	< 0.001*	0.074	< 0.001*
310	Mean	5.20	4.87	6.33	4.67	13.63
	SD	0.10	0.21	0.06	0.21	0.15
	Median	5.20	4.80	6.30	4.60	13.60
	p-value		0.822	0.003*	0.085	< 0.001*

A1 showed significant differences at 4th day and 16th day intervals with insignificant differences at other time intervals.A2 and A3.5 and B2 showed consistently significant difference in ΔE value compared to the control value for almost all intervals of immersion time, except for the 4th day interval.A3 showed no notably significantly different values except for the values at 16th day interval. B1 showed consistently significant difference in ΔE value compared to the control value for almost all intervals of immersion time, except for the 24th hour interval. 110, 120 and 220 showed consistently significant difference in ΔE value from the control value for almost all intervals of immersion time except for 4th day interval.130 showed consistently significant difference in ΔE value from the control value for almost all intervals of immersion time, including a significant difference at the 16th day after immersion.140 showed significant differences at 24th hour and 16th day time intervals as compared to control values. 310 showed consistently significant difference in ΔE value from the control value for almost all intervals of immersion time except for 6th hour and 4th day interval.

Table 3 displays the mean, median and standard deviation of three readings of ΔE for each selected shade tab from two different shade guides at every specified interval of time of immersion in a solution of Sterillium. The ΔE values at each time interval for each selected shade tab from two different

ceramic shade guides were compared with their respective control values (before immersion) and the sta istical differences detected were indicated with the appropriate superscript(*),

Table 3

Vitapan Classic		Delta E				
		Baseline	**6th hr**	**24th hr**	**Day 4**	**Day 16**
A1	Mean	7.67	7.43	11.57	5.97	11.90
	SD	0.06	0.12	0.42	0.06	0.17
	Median	7.70	7.50	11.70	6.00	12.00
	p-value		0.118	0.005*	0.001*	< 0.001*
A2	Mean	6.53	7.43	12.13	5.97	11.30
	SD	0.21	0.29	0.06	0.21	0.10
	Median	6.30	6.20	11.40	5.90	10.50
	p-value		0.060	< 0.001*	0.014*	0.001*
A3	Mean	6.47	6.10	11.10	5.87	10.17
	SD	0.31	0.10	0.26	0.06	0.29
	Median	6.40	6.10	11.00	5.90	10.00
	p-value		0.212	0.004*	0.102	0.007*
A3.5	Mean	5.80	6.77	11.60	5.27	8.97
	SD	0.00	0.15	0.17	0.25	0.23
	Median	5.80	6.80	11.50	5.30	9.10
	p-value		0.010*	0.055	0.329	0.073
B1	Mean	7.03	7.10	8.40	5.77	12.83
	SD	0.06	0.10	0.17	0.23	0.21
	Median	7.00	7.10	8.50	5.90	12.90
	p-value		0.184	0.009*	0.009*	0.001*
B2	Mean	5.00	6.90	7.43	3.53	13.60
	SD	0.10	0.10	0.25	0.15	0.00
	Median	5.00	6.90	7.40	3.50	13.60
	p-value		0.003*	0.007*	0.001*	< 0.001*

Ivoclar Chromascop		Delta E				
		Baseline	**6th hr**	**24th hr**	**Day 4**	**Day 16**
110	Mean	5.33	6.37	11.53	4.33	13.23
	SD	0.06	0.15	0.15	0.06	0.25
	Median	5.30	6.40	11.50	4.30	13.20
	p-value		0.013*	< 0.001*	0.003*	< 0.001*
120	Mean	5.60	6.67	11.60	5.10	10.57
	SD	0.17	0.25	0.26	0.20	0.12
	Median	5.50	6.70	11.50	5.10	10.50
	p-value		0.007*	0.001*	0.138	0.001*
130	Mean	5.40	5.50	11.00	4.77	12.03
	SD	0.10	0.20	0.17	0.12	0.15
	Median	5.40	5.50	10.90	4.70	12.00
	p-value		0.225	0.001*	0.003*	< 0.001*
140	Mean	5.30	6.30	11.80	5.27	12.13
	SD	0.17	0.00	0.36	0.15	0.15
	Median	5.40	6.30	11.90	5.30	12.10
	p-value		0.010*	0.002*	0.840	0.001*
220	Mean	7.10	7.93	11.73	7.13	9.87
	SD	0.00	0.15	0.23	0.06	0.12
	Median	7.10	7.90	11.60	7.10	9.80
	p-value		0.011*	0.001*	0.423	0.001*
310	Mean	5.20	4.30	9.90	4.70	11.83
	SD	0.10	0.10	0.17	0.17	0.21
	Median	5.20	4.30	9.80	4.60	11.90
	p-value		0.758	0.001*	0.082	< 0.001*

A1, A2 and B1 showed significant difference from the control value for almost all intervals of immersion time, but showed no significant difference at the 6th hour after immersion.A3 showed no notably significantly different values except at the 24th hour and 16th day interval. A3.5 showed notably significantly different values except at the 24th hour and 4th day interval.

B2 showed consistently significant difference in ΔE value from the control value for almost all intervals of immersion time, including a significant difference at the 16th day after immersion.110 showed consistently significant difference in ΔE value from the control value for almost all intervals of immersion time, including a significant difference at the 16th day after immersion.120,140 and 220 showed consistently significant difference in ΔE value compared to the control value for almost all intervals of immersion time except for the 4th day interval.130 showed consistently significant difference in ΔE value from the control value for almost all intervals of immersion time, except for at 6th hour interval. 310 showed consistently significant difference in ΔE value from the

control value for almost all intervals of immersion time, except for the 6th hour and 4th day interval.

Table 4 displays the mean, median and standard deviation of three readings of ΔE for each selected shade tab from two different shade guides at every specified interval of time of immersion in a solution of chlorhexidine. The ΔE values at each time interval for each selected shade tab from two different ceramic shade guides were compared with their respective control values (before immersion) and the statistical differences detected were indicated with the appropriate superscript(*).

Table 4

VITAPAN CLASSIC		Delta E				
		Baseline	**6th hr**	**24th hr**	**Day 4**	**Day 16**
A1	Mean	7.67	4.83	8.80	4.17	12.43
	SD	0.06	0.15	0.26	0.06	0.15
	Median	7.70	4.80	8.70	4.20	12.40
	p-value		0.002*	0.014*	< 0.001*	< 0.001*
A2	Mean	6.53	5.47	8.03	4.47	12.57
	SD	0.21	0.21	0.25	0.06	0.06
	Median	6.30	9.50	9.40	5.20	13.30
	p-value		0.012*	0.030*	0.002*	0.001*
A3	Mean	6.47	9.47	9.57	5.20	13.33
	SD	0.31	0.06	0.21	0.10	0.06
	Median	6.40	9.50	9.50	5.20	13.30
	p-value		0.005*	0.001*	0.029*	< 0.001*
A3.5	Mean	5.80	9.07	9.10	7.20	15.33
	SD	0.00	0.06	0.10	0.17	0.15
	Median	5.80	9.10	9.10	7.30	15.30
	p-value		0.295	0.003*	0.746	0.014*
B1	Mean	7.03	4.83	8.80	4.17	12.43
	SD	0.06	0.15	0.26	0.06	0.15
	Median	7.00	4.80	8.70	4.20	12.40
	p-value		0.001*	0.010*	< 0.001*	< 0.001*
B2	Mean	5.00	8.93	8.70	8.67	14.40
	SD	0.10	0.21	0.30	0.23	0.20
	Median	5.00	9.00	8.70	8.80	14.40
	p-value		0.002*	0.004*	0.003*	< 0.001*

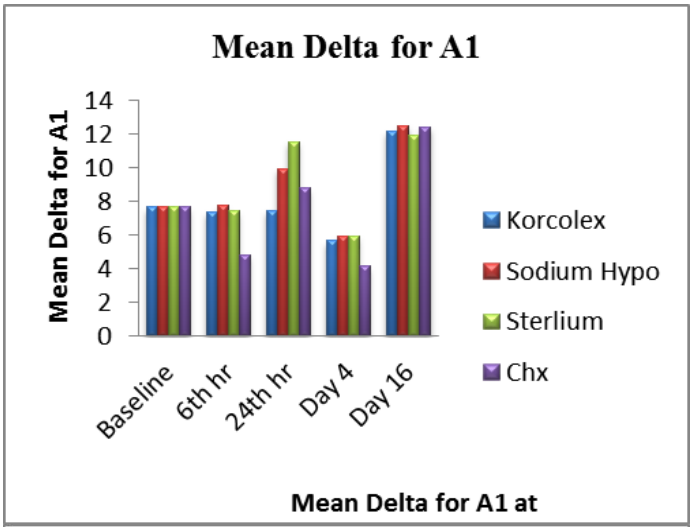
IVOCLAR CHROMASCOP		Delta E				
		Baseline	**6th hr**	**24th hr**	**Day 4**	**Day 16**
110	Mean	5.33	8.80	8.93	4.17	12.43
	SD	0.06	0.17	0.21	0.06	0.15
	Median	5.30	8.70	9.00	4.20	12.40
	p-value		0.001*	0.001*	0.001*	< 0.001*
120	Mean	5.60	8.80	9.00	4.90	11.67
	SD	0.17	0.20	0.69	0.00	0.15
	Median	5.50	8.80	8.60	4.90	11.70
	p-value		< 0.001*	0.008*	0.020*	< 0.001*
130	Mean	5.40	10.73	10.43	4.47	12.57
	SD	0.10	0.06	0.25	0.06	0.06
	Median	5.40	10.70	10.40	4.50	12.60
	p-value		< 0.001*	0.001*	0.009*	< 0.001*
140	Mean	5.30	10.60	10.40	5.30	12.50
	SD	0.17	0.20	0.35	0.10	0.10
	Median	5.40	10.60	10.20	5.30	12.50
	p-value		0.001*	0.001*	1.000	< 0.001*
220	Mean	7.10	8.67	8.63	7.07	10.83
	SD	0.00	0.06	0.12	0.15	0.21
	Median	7.10	8.70	8.70	7.10	10.90
	p-value		< 0.001*	0.002*	0.742	0.001*
310	Mean	5.20	6.07	5.77	7.30	13.80
	SD	0.10	0.12	0.15	0.20	0.26
	Median	5.20	6.00	5.80	7.30	13.90
	p-value		0.521	0.023*	0.005*	< 0.001*

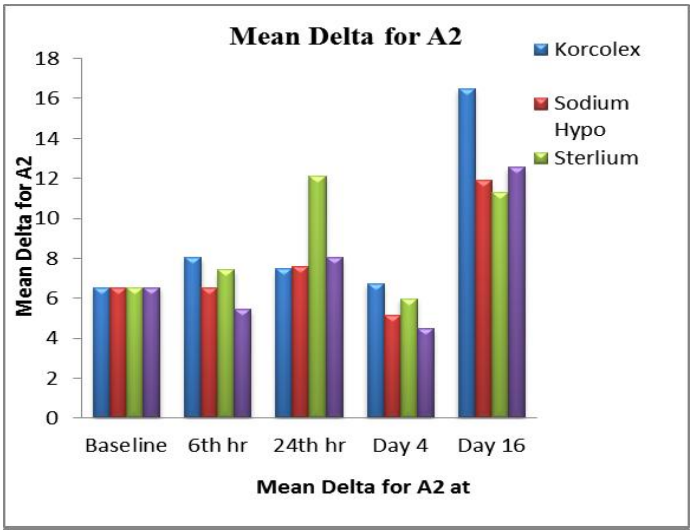
A1 and A2 showed significant difference from the control value for almost all intervals of immersion time. A3, B1 and B2 showed consistently significant difference in ΔE value from the control value for almost all intervals of immersion time, including a significant difference at the 16th day after immersion.A3.5 showed consistently significant difference in ΔE value from the control value for almost all intervals of immersion time, except at the 6th hour and 4th day intervals. 110, 120 and 130 showed consistently significant difference in ΔE value from the control value for almost all intervals of immersion time, including a significant difference at the 16th day after immersion. 140 showed consistently significant

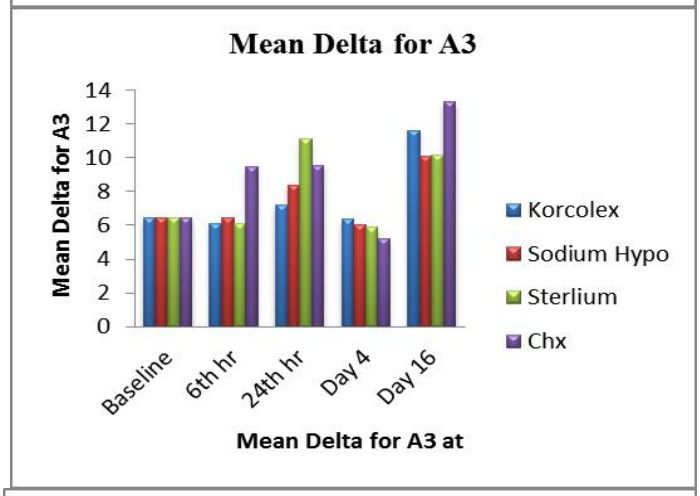
difference in ΔE value from the control value for almost all intervals of immersion time, except for at 4th day interval. 220 showed significant difference in ΔE value from the control value for almost all intervals of immersion time, except for the 4th day interval. 310 showed significant difference in ΔE value from the control value for almost all intervals of immersion time, except for the 6th hour interval.

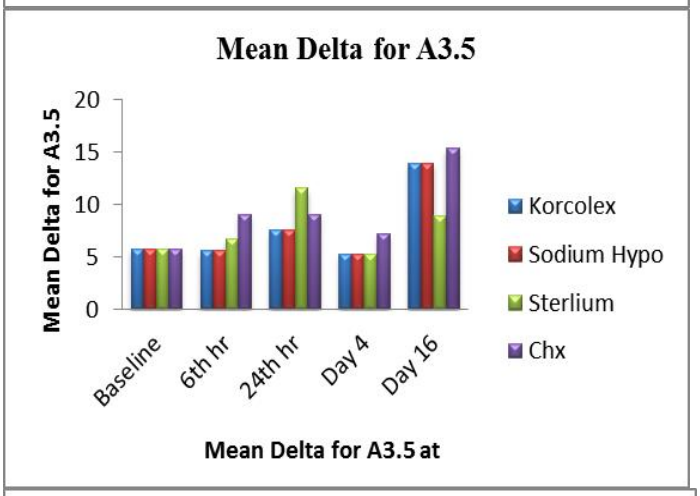
From the above observations, it may also be assumed that on giving time, with freedom from immersion into the disinfectant, the shade tabs regain colour to approach their original colour. It was noted that the shades which were preferentially affected by sodium hypochlorite and glutradehyde showed such changes at 16 day or 4 years for Vitapan Shade Guide and as early as 24 hours or 1 year and 16 days or 4 years for Ivoclar Chromascop Shade Guide. Shades which were preferentially affected by isopropyl-alcohol showed such changes at as early as 24 hours or 1 year and 16 days or 4 years for both Vitapan Classic and Ivoclar Chromascop Shade Guides. Shades which were preferentially affected by chlorhexidione gluconate showed such changes at as early as 6 hours or 3 months and 16 days or 4 years for both Vitapan Classic and Ivoclar Chromascop Shade Guides.

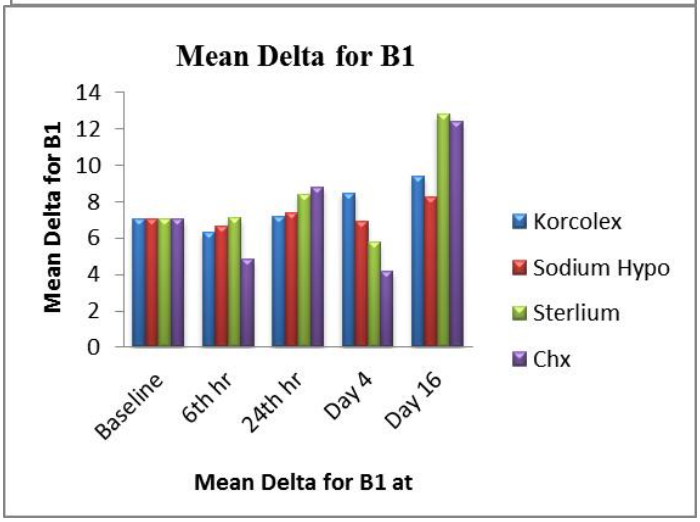
Graphical Analysis

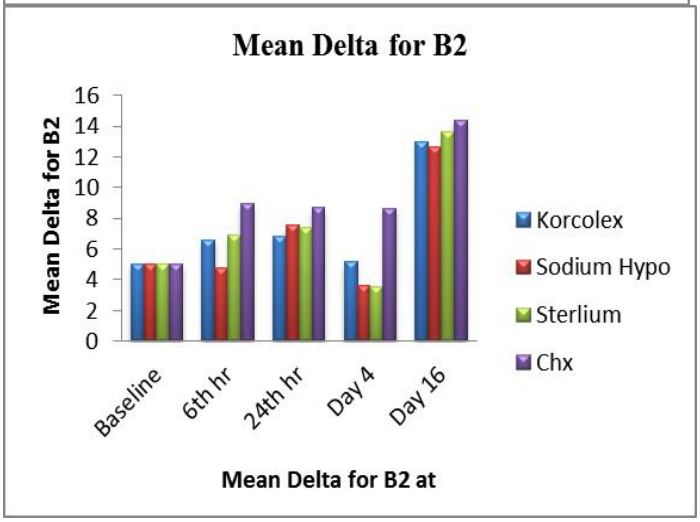


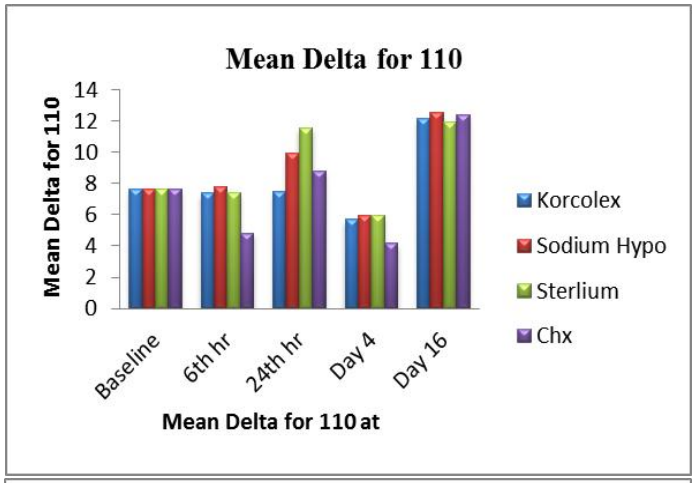


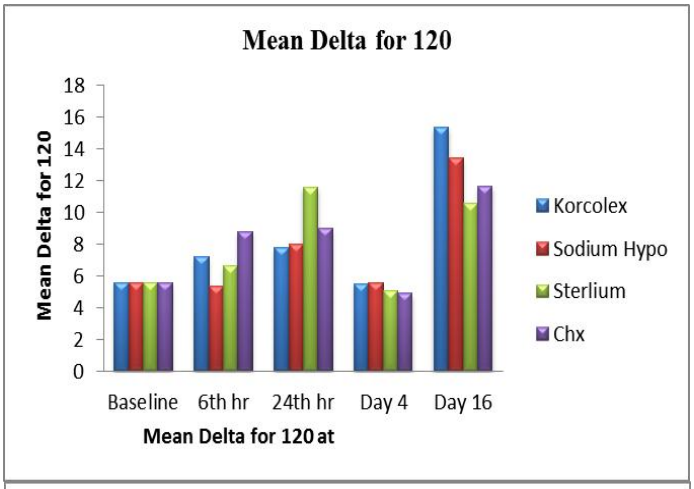


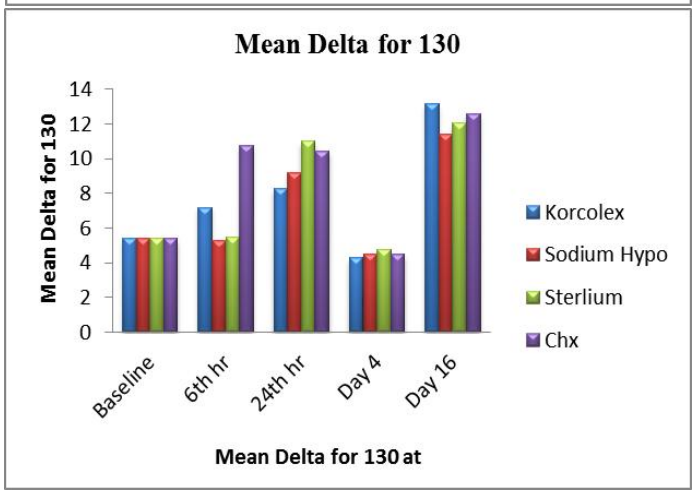


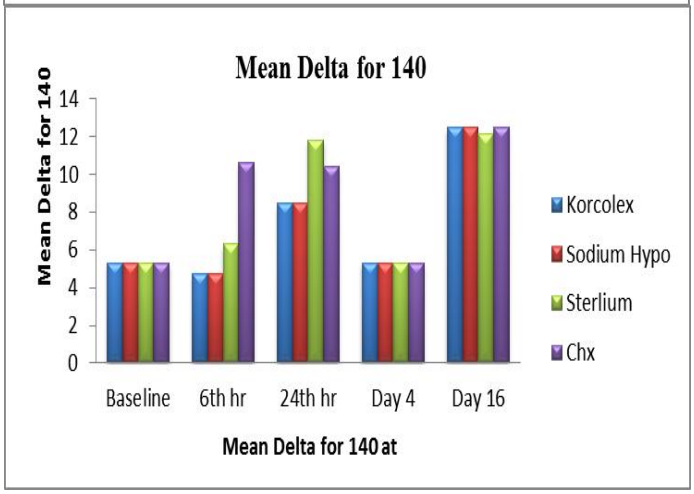












Statistical analysis of the data obtained revealed that both shade guides showed significant differences in ΔE values in a considerable number of shades at varying time intervals when compared to their control colour before immersion. This was in accordance with the results obtained by Pohjola *et al* in 2007 in which they observed a statistically significant increase in the value and chroma of the shade tabs subjected to disinfection with Cavidex (Metrex Research) after 2 and 3 years of simulated treatment.

Conclusion

Taking into consideration all the observations and limitations of the study, it can be safely deduced that-

-Sodium hypochlorite and glutraldehyde (korsolex) produce more definite and early change in colour on shade tabs from Ivoclar Chromacop shade guide than Vitapan Classic shade guide.

-Isopropyl alcohol (sterillium) produces definite change in colour on shade tabs from Ivoclar Chromacop shade guide and Vitapan Classic shade guide equally.

-Of all the disinfectants used Chlorhexidine gluconate (Asep RC) produced early change in colour (3 months) of shade tabs from Ivoclar Chromacop shade guide and Vitapan Classic shade guide and thus its use for clinical disinfectation of shade guides is not recommended.

-Also, one shade guide should be retained as a control and periodically compared with the shade guide in use to determine when the shade tabs in use should be replaced or discarded.

References

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5. Yap AU, Sim CP, Loh WL, Teo JH. Human-eye versus computerized color matching. Oper Dent. 1999; 24(6):358-63.