THIMEROSAL vs. BENZALKONIUM CHLORIDE
A STUDY OF HGP WETTING SOLUTIONS

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My investigation was a side-by-side comparison study of a thimerosal and a benzalkonium chloride preserved hard gas permiable contact lens wetting solutions. My objective was to find if there was any significant difference between the two solutions.

The patients were five Optometry Students who were successful HGP wearers. Each had worn his lenses for three months or longer and could comfortably wear his lenses ten hours a day or longer. Each was satisified with his lenses and had no intention of changing to a different lens material or going to full time spectacle wear.

Two readily available solutions were selected Soaclens with thimerosal and Wet-N-Soak with benzalkonium chloride. The solutions were put in bottles marked A and B. Each patient was instructed to use solution A for his right eye and solution B for his left eye. Three of the A bottles were Wet-N-Soak and two were Soaclens; each of the B bottles had the complimentary solution.

Each patient was scheduled for four examinations at approximately one week intervals. Visual acuities were taken at near and distance during each examination. Corneal health was evaluated using fluorescein at each examination. Lens fit and surface quality were evaluated on the first and and last examination. During the first examination each patient was asked if he had any allergies to any contact lens solution. A series of six questions comparing the two solutions were asked and the responses were recorded during each examination. Only questions 3,5 and 6 were asked during the first examination since the others didn't apply.

The following tables are provided to make an assessment and comparison of Data more convenient.

None of the five patients had any history of contact lens solution allergies.

The following abbreviations are used in the tables which follow to simplify analysis: Y:Yes N:No N/S:No Show D:Discontinued using one solution E:Equal Ex:Examination A:Solution A B:Solution B Vc:Visual Acuity at distance Vc':Visual Acuity at near Ptn:Patient

TABLE # 1 Visual Acuities

	1st Ex	2nd Ex	3rd Ex	4th Ex
Ptn #1	OD:20/15 Vc: OS:20/15 OD:20/15 Vc':OS:20/20	OD:20/15 Vc: OS:20/15 OD:20/20+ Vc': OS:20/20+	OD:20/15- Vc: OS:20/15 OD:20/20+ Vc': OS:20/15-	OD:20/15 Vc: OS:20/15 OD:20/20+ Vc': OS:20/20+
Ptn #2	OD:20/15 Vc: OS:20/15 OD:20/20 Vc':OS:20/20	OD:20/15 Vc: OS:20/15 OD:20/20 Vc': OS:20/20	OD:20/15 Vc: OS:20/15 OD:20/20 Vc': OS:20/20	OD:20/15 Vc: OS:20/15 OD:20/20 Vc': OS:20/20
Ptn #3	OD:20/20+ Vc: OS:20/20+ OD:20/20+ Vc':OS:20/20	OD:20/20+ Vc: OS:20/20+ OD:20/20 Vc': OS:20/20	OD:20/20+ Vc: OS:20/20+ OD:20/20 Vc': OS:20/20+	Discontinued
Ptn #4	OD:20/15 Vc: OS:20/15 OD:20/20+ Vc':OS:20/20+	OD:20/15 Vc: OS:20/15 OD:20/20+ Vc': OS:20/20+	N/S	OD:20/15 Vc: OS:20/15 OD:20/20+ Vc': OS:20/20+
Ptn #5	OD:20/20+ Vc: OS:20/20 OD:20/20 Vc':OS:20/20	OD:20/20 Vc: OS:20/20 OD:20/20 Vc': OS:20/20	N/S	OD:20/40 Vc: OS:20/20 OD:20/20 Vc': OS:20/20

The only significant change in Visual Acuity was that of Ptn #5 during his fourth examination. Ptn #5 lost his right contact lens and was wearing a lens which was over-plused by +1.00D.

TABLE # 2 Wearing Time h:hours m:months y:years

	1st Ex	2nd Ex	3rd Ex	4th Ex
Ptn #1	10h/17h/3m	9h/15h	5h/15h	8h/15h
Ptn #2	11h/16h/5y	11h/16h	10h/16h	11h/16h
Ptn #3	1h/11h/9m	8h/10h	10h/10h	Discontinued
Ptn #4	2h/15h/1.5y	2.5h/15h	N/S	2h/15h
Ptn #5	1.5h/10h/3y	8h/12h	N/S	10h/8h

TABLE # 3 Examination Dates

	1st Ex	2nd Ex	3rd Ex	4th Ex
Ptn #1	2/12/86	2/21/86	3/12/86	3/21/86
Ptn #2	2/12/86	2/20/86	3/12/86	3/19/86
Ptn #3	2/12/86	2/20/86	3/12/86	discontinued
Ptn #4	2/18/86	2/25/86	N/S	3/16/86
Ptn #5	2/18/86	2/26/86	N/S	3/20/86

TABLE # 4 Corneal Health as evaluated by biomicroscopy with fluorescein

	1st Ex	2nd Ex	3rd Ex	4th Ex
Ptn #1	OD: 1+ 3-9 stain 1+ sm. papillae	OD: same	OD: same	OD: same
	OS: same	OS: same	OD: same	OS: same
Ptn #2	OD: 1+ 3-9 stain coalesced stain at 3&9 scar at 12	OD: same	OD: same only no coalesced stain at 3&9	OD: same as Ex3
	OS: 1+ 3-9 stain	OS: same	OS: same	OS: same
Ptn #3	OD: Clear 1+ sm. papillae	OD: 1+ 3-9 stain 1+ sm. papillae	OD: 1+ 3-9 stain 1+ sm. papillae	discontinued
	OS: same	OS: same	OS: same	
Ptn #4	OD: Clear	OD: 1+ diffuse stippling of entire cornea	N/S	OD: 1+ 3-9 stain
	OS: same	OS: same		OS: same
Ptn #5	OD: Clear	OD: 1+ 3-9 stain	N/S	OD: 1+ 3-9 stain
	OS: same	OS: same		OS: same

No difference was noted between the right and left eyes in examinations 2, 3 and 4 that were not noted during the initial examination.

TABLE # 5 Contact Lens Fit

	1st Ex	4th Ex
Ptn #1	OD: "on K" good centration and movement good upper lid coverage	OD: same
	OS: same	OS: same

TABLE # 5 continued

Ptn #2	OD: +0.50D steep good movement centers low intrapalpebral fit	OD: same
	OS: same	OS: same
Ptn #3	OD: "on K" centers down and and out good movement	OD: same
	OS: same	OS: same
Ptn #4	OD: +0.50D steep rides up & in good movement	OD: same
	OS: same	OS: same
Ptn #5	OD: "on K" intrapalpebral fit rides low good movement	OD: same
	OS: same	OS: same

No change in fit was noted between the first and final examination. All five patients had essentially the same fit on each eye.

TABLE # 6 Case History each patient was asked the following question as applicable to the examination:

1. Are you using both solutions?
2. Is there any activity that you are involved in where one lens is definately more comfortable?
3. Does either eye sting when you initially insert the lens?
4. Does either eye sting after you have worn the lenses for a few hours.
5. Is one lens more comfortable?
6. Does one eye feel drier than the other?

		Ptn #1	Ptn #2	Ptn #3	Ptn #4	Ptn #5
Question #1	2nd Ex	Y	Y	Y	Y	Y
	3rd Ex	Y	Y	N	N/S	N/S
	4th Ex	Y	Y	D	Y	Y
Question #2	2nd Ex	N	N	N	N	N
	3rd Ex	N	N	D	N/S	N/S
	4th Ex	N	N	D	N	N
Question #3	1st Ex	N	N	N	N	N
	2nd Ex	N	N	N	N	N
	3rd Ex	N	N	D	N/S	N/S
	4th Ex	N	N	D	N	N
Question #4	2nd Ex	N	N	N	N	N
	3rd Ex	N	N	D	N/S	N/S
	4th Ex	N	N	D	N	N

TABLE # 6 continued

		Ptn #1	Ptn #2	Ptn #3	Ptn #4	Ptn #5
Question #5	1st Ex	N	N	N	N	N
	2nd Ex	N	N	N	Wet-N-Soak	N
	3rd Ex	N	N	D	N/S	N/S
	4th Ex	N	N	D	Wet-N-Soak	Soaclens
Question #6	1st Ex	N	N	N	N	N
	2nd Ex	N	N	N	N	N
	3rd Ex	N	N	D	N/S	N/S
	4th Ex	N	N	D	N	N
Solution Prefered	4th Ex	Equal	Equal	Wet-N-Soak	Wet-N-Soak	Soaclens

Patients #1 and #2 felt that there was not an appreciable difference between the two solutions. Patient #3 developed a red eye and discontinued using Soaclens. Patient #3 was told by a clinical instructor that he felt he might be developing a thimerosal sensitivity. Patient #4 prefered Wet-N-Soak because it was less viscous and his vision cleared up faster after he inserted the lens. Patient #5 prefered Soaclens because it was more viscous and he liked the cushioning effect it had upon insertion.

There was essentially little difference between the two solutions as long a thimerosal sensitivity didn't develop. If my sample was representative and one of five could develop a sensitivity then I feel the risk involved in using thimerosal preserved solutions is definately not worth it.