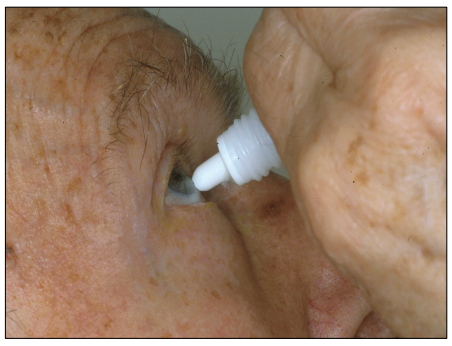
EFFECT OF A NEW AUDIBLE AND VISUAL REMINDER SYSTEM ON ADHERENCE WITH TOPICAL OCULAR THERAPY



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PURPOSE & METHODS

Purpose:
Non-compliance is a crucial factor associated with failure of topical therapy in glaucoma. Forgetfulness is a major barrier to adherence that might be avoided by electronic reminder systems. We here aimed to study the impact of a visual and audible reminder system on adherence to topical ocular therapy.

Methods:
Commercially available eye drops containing artificial tear fluid (Hylo-Comod®, Ursapharm Arzneimittel GmbH, Germany) were equipped with electronic adherence monitoring and reminder devices adapted to pump based multidose containers. After written informed consent 18 healthy volunteers applied one drop to one eye 5x daily at 8,11,14,17, 20 hours for 2 weeks. During the first week the devices were programmed to record adherence without emission of any signal. During the second week the treatment schedule was enforced by audible and visual signals emitted from the eye drop containers in case of non-adherence at designated hours. Electronic dosing information was analyzed for mean rates of adherence, mean dosing interval and number of missed doses, defined as lack of dosing events at designated hours ± 2h. The effect of the reminder signals was assed by comparisons of means using Student's t-test, paired t-test or the Wilcoxon signed rank test where applicable.

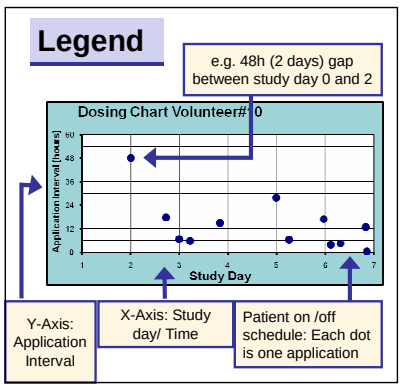

Figure 1

Figure 2

RESULTS

Mean dose adherence with activated audible and visual reminder signals was 87,6 ±17 % (range 35-100%) and thus significantly higher than without reminder signals (mean 71,1 ±21 %, range 48-100%, p=0,004). The mean number of missed doses was reduced by 56 % when the signals were active (16,9 ±9 versus 7,4 ±6, p=0,002). Mean dosing intervals were also reduced from 7,9 ±3 h to 6.2 ±2 h (p=0,04) when signals were turned on. Dose adherence was improved by more than 20 % in 7 out of 18 volunteers. These seven individuals had a significantly lower mean dose adherence (57,7 ±13 %) without active reminder system when compared to rest (82,7 ±22 %, p=0,02).

References:

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RESULTS

Table 1	No Signal Mean ±SD	Reminder Signal Mean ±SD	p=
Dose Adherence **DA %**	**71.06 ±21.03 %**	**87.58 ±16.79 %**	0.004
Missed Doses **N**	**16.89 ±8.55 %**	**7.38 ±5.97 %**	0.021

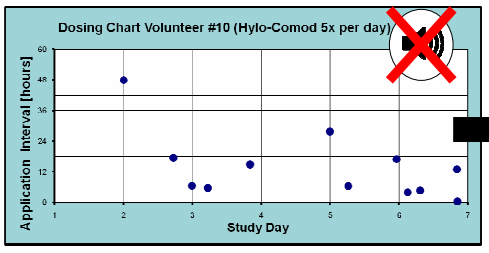
Table 2	**High Responders** (Patients gaining >20% with reminder signal, n=7)	**Low Responders** (Patients gaining <20% with reminder signal)	p=
Improvement of DA Mean ±SD [range]	**32.4 ±12.1 %** [21 to 54%]	**2.6 ±9.4 %** [-9.2 to 13%]	0.0001
DA **without** reminder Mean ±SD [range]	**57.8 ±13.4 %** [38 to 77%]	**82.7 ±22.4 %** [35 to 103%]	0.021
DA **with** reminder Mean ±SD [range]	**90.2 ±8.3 %** [81 to 106%]	**85.3 ± 22.2%** [47 to 108%]	0.779

CONCLUSIONS

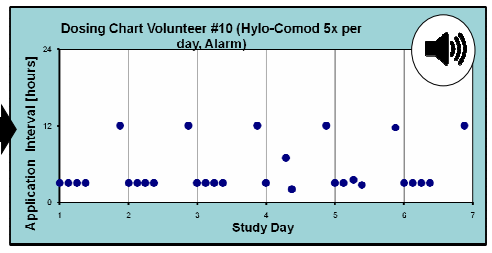
Audible and visual reminder signals specifically improved adherence to short-term therapy with eye drops in individuals with low dose adherence. The observed reduction of missed doses by more than half could be helpful in glaucoma therapy. Still, the long-term effect of this reminder system on adherence with topical glaucoma therapy remains to be studied.

INDIVIDUAL RESULTS

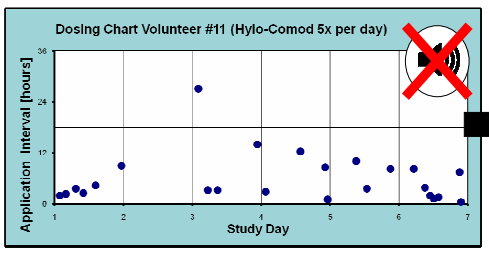
Without Signal | **With Reminder Signal**



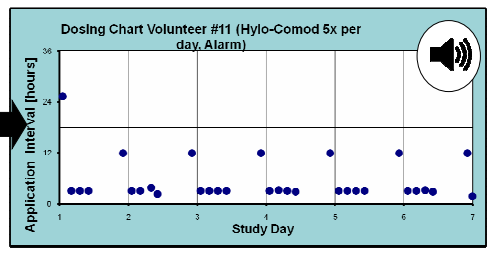
Volunteer 1: Dosing chart without signal showing frequent treatment gaps of up to 48h. No regular application schedule visible.



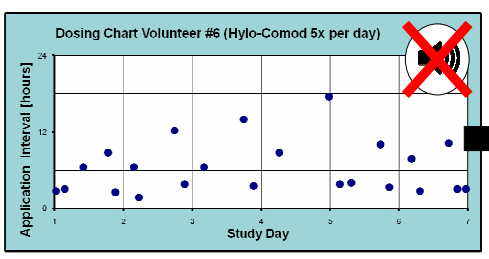
Volunteer 1: Dosing chart with active reminder signal and improved dosing schedule.



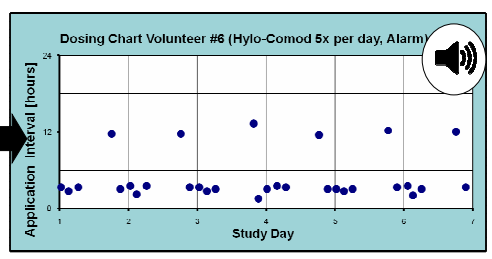
Volunteer 2: Dosing chart without signal showing treatment gaps of up to 26h. No regular application schedule visible.



Volunteer 2: Dosing chart with reminder system showing regular applications.



Volunteer 3: Dosing chart without signal showing frequent treatment Gaps of up to 18h.



Volunteer 3: Dosing chart with active reminder system showing an improved dosing schedule.