Effect of a new electronic reminder system on adherence with topical ocular therapy

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Purpose: Non-adherence is a critical factor associated with failure of topical therapy in glaucoma. Forgetfulness is a major barrier to compliance 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 assessed by comparisons of means using Student’s t-test, paired t-test or the Wilcoxon signed rank test where applicable.

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).

Conclusion: 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.