Binocular Therapy for Childhood Amblyopia Improves Vision without Breaking Interocular Suppression:

Supplemental materials


Visual Outcome: Other Factors

Supplemental Figure 1 summarises how age, type and severity of initial amblyopia and treatment durations influenced outcome. Of the children who stopped after 8 weeks (N=12), 7 from Group 1 were not allowed to continue based on our protocol, while 5 from Group 2 were released due to a lack of further improvement. The mean gain in acuity after 8, 16 or 24 weeks was 0.20±0.24, 0.24±0.11 or 0.41±0.16 LogMAR respectively (see Supp. Fig. 1A). Paired comparisons did not reveal a significant influence of the duration of the treatment on the final gains in acuity (not even between 24 versus 8 weeks, whose relative mean acuity gains showed the largest reciprocal difference; p=0.07). Differences in the maximum permissible period of treatment across groups precludes detailed comparison between groups. However, dependence of treatment response on the type of amblyopia is summarised in Supplemental Figure 1B. Visual acuity improved on average by 0.26 (SD 0.28), 0.34 (SD 0.21) or 0.23 (SD 0.17) LogMAR respectively in children with anisometropic, strabismic or combined-mechanism amblyopia. A two-sample paired t-test indicated there was no statistical significance between the mean-gain achieved for each type of amblyopia (anisometropic vs strabismic, p=0.54; anisometropic vs combined, p=0.80; strabismic and combined, p=0.26). There was no significant dependence of the severity of initial amblyopia with either the final absolute improvement in vision (mean acuity gain in the AE; $R^2=0.13$, $p = 0.09$; see Supp. Fig. 1C) or the final proportion of deficit corrected ($R^2=0.0006$, $p = 0.91$).

Lower age has been associated with higher probability of a successful treatment, possibly preventing the applicability of a treatment in adults: compliance (e.g. to patching) reduces with increasing age (Wallace et al. 2013, Stewart et al., 2005, Scheiman et al., 2005) and so does cortical plasticity (Lewis et al., 2005). Using regression analysis (least-squares fitting) we found that the age of participants did not differentially influence the change in acuity in the AE ($R^2= 0.001$, $p_{(F=0.03)} =0.87$; see Supp. Fig. 1D). Accordingly, there was no dependence of age for children in Group 1 (mean age 9.46±1.93 yrs) or Group 2 (mean age
5.12±1.97 yrs), on the final gain in acuity in the AE (two-sample t-test: p=0.86). Within Group 1, we did however find an effect of age on stereoacuity measurements (Wilcoxon-paired, p=0.02 at α=0.05), though this was not measureable in Group 2. Finally, we considered the possibility that suppression changed with age by taking the individual suppression index averaged over the daily measures, for the duration of BBV treatment. Here we found no significant dependence of age on suppression ($R^2 = 0.14$, $p (F=3.21) =0.09$).

**Supplemental Figure 1** Other factors that may have influenced treatment outcome (A,B: mean improvement or C, D: individual gain). A: Longer treatments led to greater but not significantly different gains in visual acuity. B: Relations between the type of amblyopia and the improvement in VA (none were significant). The dashed lines (in A and B) show the mean test-retest reliability for acuity tests in children. Error bars show one standard error of uncertainty. C: Severity of amblyopia (initial VA in the AE) showed moderate influence on acuity gain in the AE, though this was not significant ($R^2 = 0.134$, $p=0.09$). D: Age (yrs) was not significantly correlated ($R^2 = 0.001$, $p=0.87$) with acuity gain in the AE.