Recalibration, not realignment improves visuospatial attention in patients with neglect. Results from an RCT using prism adaptation

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Prism adaptation training (PAT) is a treatment option for visuospatial neglect (VSN) and presumably involves two components: recalibration and realignment. We investigated their differential effect on VSN by systematically varying the PAT protocol. Previous studies have investigated single-step and multi-step PAT protocols with concurrent (CE) or terminal exposure (TE). CE and multi-step protocols are associated with realignment and little recalibration, whereas TE or single-step procedures lead to stronger pointing errors allowing for increased recalibration. We conducted a randomized controlled trial with PAT protocols requiring different degrees of recalibration and realignment. During five consecutive days, each of the 25 VSN patients received an initial alertness treatment without prisms, followed by four PAT protocols in random order. They included a multi-step or single-step procedure with TE, a single-step procedure with CE, and sham PAT. Per protocol, 250 pointing movements within 34° of spatial extent were conducted. The primary outcome parameter was Posner's covert shift of attention task. Both the TE, but not the CE protocol produced significant aftereffects (compared to the sham PAT). The single-step PAT protocol with TE also resulted in significantly shorter response times (RTs) to left-sided targets (i.e., ameliorated VSN). whereas no difference inRTs to left- and right-sided targets was observed in any other protocol. We conclude that aftereffects may form a necessary but not a sufficient condition for the effect of PAT on VSN. Moreover, only forcing VSN patients to recalibrate with a constant 10° shift and late visual awareness of the arm position has a beneficial effect on non-motor leftwards visuospatial attention. Therefore, the experience of pointing errors (allowing for recalibration) appears to play a more important role for the leftward orientation of attention and for treating VSN.