

Testing the Sprague effect with unilateral eye patching in left-hemispheric and right-hemispheric patients after small and large strokes

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An astonishing phenomenon in brain physiology is the Sprague effect, whereby visuospatial neglect in cats, artificially induced by large unilateral lesions, could be reversed by subsequent damage of the contralateral superior colliculus (SC). Monocular patching of the ipsilesional eye has been discussed as a non-invasive opportunity to imitate the Sprague effect in humans. On this background, we aimed to investigate whether monocular ipsilesional eye patching improves contralesional attention in patients with small and large left-hemispheric (LH) and right-hemispheric (RH) strokes. In study 1, 20 LH and 20 RH patients with a small MCA stroke monocularly completed the Posner cueing task. There were no eye patch-induced effects in the LH group. In contrast, in the RH group, the eye patch modified ipsilesional but not contralesional covert attention, presumably due to differences in SC activation between the two eye patch conditions. In study 2, 13 LH and 22 RH patients with a large stroke and contralesional neglect completed a monocular video-oculographic examination of horizontal smooth pursuit and reactive saccades. Whereas there were no eye patch effects in the LH group, in the RH group the eye patch modulated contralesional ocular performance. However, ipsilesional eye patching brought no therapeutic benefit but rather led to a deterioration of neglect symptomatology. I will discuss the implications of the two studies' findings regarding new therapeutic approaches for patients with visuospatial attention problems.