Compensatory rehabilitation limits motor recovery after stroke

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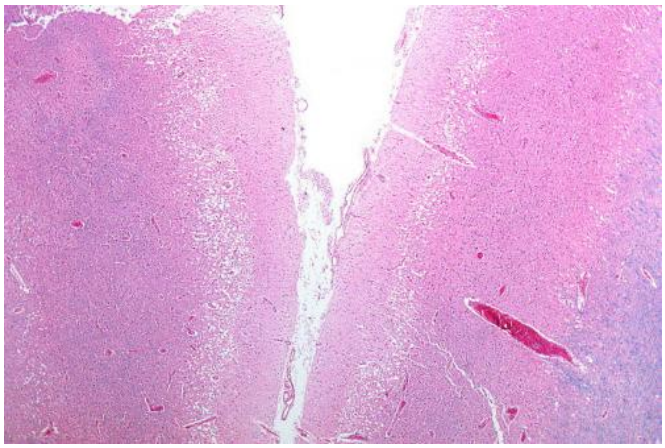

Micrograph showing cortical pseudolaminar necrosis, a finding seen in strokes on medical imaging and at autopsy. H&E-LFB stain. Credit: Nephron/Wikipedia

Relying on the better-functioning side of the body after a stroke can cause brain changes that hinder rehabilitation of the impaired side, according to an animal study published June 3 in the *Journal of Neuroscience*.

Strokes that occur in one brain hemisphere can result in poor motor function on the opposite side of the body, leading to heavy reliance on the "good" side. This study, led by Soo Young Kim and performed at the University of Texas at Austin and the University of California, Berkeley, found that such compensation produces structural brain changes at the site of the stroke in rats, limiting recovery of the injured side.

- Using rats, the researchers selectively damaged an area of the brain that controls the movement of the front legs. Only one side of the brain was damaged, and this led to impairment of the opposite leg.
- One group of rats was trained to use the unaffected, "good" leg to compensate for the injury, while the control group did not get this training. Both groups of rats then received rehabilitative training for the injured limb.
- The rats that were trained to use their "good" side had less brain area devoted to the control of the impaired limb. They also had more connections between neurons in this area. Rather than being helpful, however, this was linked with worse function of the impaired limb.

"Training the 'good' limb after stroke may ultimately lower the level of improvement that the 'bad' limb can achieve," said Thomas Carmichael, a neuroscientist at the Geffen School of Medicine at UCLA who was not involved in the study. While more research is needed, the study suggests that current neurorehabilitation strategies "may actually be working to reduce the overall level of recovery in stroke patients," he added.

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