

## **Effects of Diabetes on Motor Recovery after Cerebral Infarct: A Diffusion Tensor Imaging Study.**

Dong Gyu Kwak<sup>1,1\*†</sup>, Min cheol Chang<sup>1,1†</sup>, Dong Gyu Lee<sup>1,1†</sup>

Department of Physical Medicine and Rehabilitation, College of Medicine, Yeungnam University<sup>1</sup>

### **Objective**

Little is known about the effects of diabetes on motor recovery after cerebral infarct. In order to obtain an accurate evaluation, we adjusted for critical factors determining motor outcomes, including lesion location and the integrity of motor-related neural tracts. We only included patients with a corona radiata infarct, and evaluated motor outcome by classifying the included patients according to the integrity of the corticospinal tract (CST) on diffusion tensor tractography (DTT).

### **Research Design and Methods**

One hundred patients were recruited, and the DTT was obtained within 7-30 days of infarct onset. Based on the DTT findings (DTT+: CST was preserved around the infarct, DTT-: CST was interrupted by the infarct) and the presence or absence of diabetes (DM+: presence of diabetes, DM-: absence of diabetes), patients were divided into DTT+/DM+ (19 patients), DTT+/DM- (36 patients), DTT-/DM+ (13 patients), and DTT-/DM- (32 patients) groups. Six months after cerebral infarct, motor function on the affected side was evaluated for each patient using the upper Motricity Index (MI), lower MI, modified Brunnstrom classification (MBC), and the functional ambulation category (FAC).

### **Results**

In the patients with a DTT+ finding, comparing the DTT+/DM+ and DTT+/DM- groups, at the six-month evaluation, no motor function scores were significantly different between the two groups. However, with respect to the patients with a DTT- finding, all motor function scores at the six-month evaluation were significantly higher in the DTT-/DM- group, compared with those in the DTT-/DM+ group.

### **Conclusion**

When the CST was interrupted by a corona radiata infarct, the presence of diabetes is a decisive factor in the patient's recovery of motor function

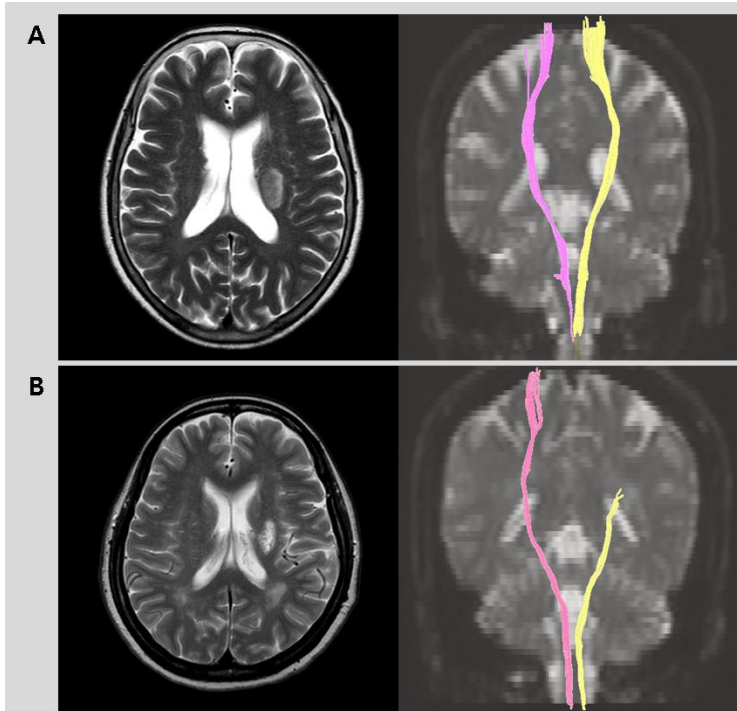


Figure 1. Classification according to the Results of diffusion tensor tractography (DTT) of the corticospinal tract. Axial T2-weighted magnetic resonance images (left) and coronal diffusion tensor tractography images (right). (A) DTT+: the corticospinal tract was preserved around the infarct. (B) DTT-: the corticospinal tract was interrupted by the infarct.