Corticobulbar projections from distinct motor cortical areas in intact macaque monkeys and following lesion of the primary motor cortex (M1)

Fregosi M., Hamadja A., Wyss A., Contestabile A., Roullier E.M.
University of Fribourg, Department of Medicine, Neuroscience, Fribourg Center of Cognition

INTRODUCTION

The corticobulbar projection, together with the corticospinal tract (CST), is an essential component of the motor system. It is responsible for the direct and indirect control of motor output from the CNS to the periphery, including voluntary movements.

METHODS

The tracer biotinylated dextran amine (BDA) was injected unilaterally in either PM, SMA, or a mixture of intact motor cortical and subcortical areas in PM or PM of intact macaque monkeys (Macaca fascicularis). The corticobulbar projections were visualized using the BDA immunohistochemistry technique. The sections were processed for Cresyl Violet and Nissl staining. The sections were photographed, and the contralateral sections for Cresyl Violet were obtained using the software Neurulex.

RESULTS

The greater number of corticobulbar projections was found in the PM lesioned monkeys. For the PM lesioned monkeys, the number of corticobulbar projections was significantly lower in the PM lesioned monkeys compared to the intact monkeys. The number of corticobulbar projections in the PM lesioned monkeys was also significantly lower in the lesioned areas compared to the intact areas.

CONCLUSION

The corticobulbar projections are essential for motor control and are affected by lesions in the primary motor cortex. Understanding the changes in these projections can provide insights into the mechanisms of motor control and the effects of lesioned areas on motor function.