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Sommario/riassunto

Since the latter half of the twentieth century an enormous amount of knowledge about mammalian motoneuron pools has been collected. This progress was enabled mostly by the development of the precise techniques of intracellular recordings in acute animal experiments, many of which were conducted under deep anaesthesia. Recently obtained evidence indicates that anaesthetics used at that times changed certain properties of the cell membrane, which might affect firing of the neuron. Experiments on normal humans gets around this problem, which lets one compare MN firing characteristics in humans and reduced preparations. Firing pattern of human motoneurons is obtained indirectly by recording from a few muscle fibres of a motor unit. Since there is one-to-one relationship between motor unit and motoneuron firing, the statistical analysis of motor unit firing is equivalent to the analysis of motoneuron firing. This analysis, based on the essential knowledge about motoneuron physiology, gained from the direct measurements in animal experiments and verified by computer simulations, allows one to draw conclusions about the physiological properties of human motoneurons. For obvious reasons, the deductions made on properties of human motoneuron from these analyses should be accepted with caution. On the other hand, human experiments provide the unique opportunity to study intact motoneurons during normal physiological behavior. Thus, combining information obtained from animal and human experiments, and

computer simulations, gives insight into underexplored problems of motor control. This E-book contains a collection of articles with range of exciting findings on the physiology and pathology of human motoneurons. The collection covers such important issues concerning firing of healthy motoneurons as recruitment and rate coding as well as motoneuron excitability, discusses intrinsic motoneuron properties disclosed by studying double discharges, and provides information on broad spectrum of motoneuron pathology. It is our hope that this collection promotes further expansion of knowledge on human motoneurons.