Relationship between the legs exercise and the walking in the rehabilitation

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Introduction

It is important to evaluate walking ability quantitatively in order to solve the problem of extended nursing dependency in the elderly community. Efficient rehabilitation can be made possible and a care worker's burden can be reduced. In this study, the movable range and speed of the legs in exercise are measured and parameters that are related to walking ability are extracted.

The targets are two movements in the experiment. They are (a) forward and backward movement of the legs which involves stretching and flexion of the knee joint, plantar flexion and dorsiflexion of the ankle joint in a seated position and (b) movement which repeats plantar flexion and dorsiflexion of the ankle joint. Measurement items are (a) time-series data of the displacement of the feet and (b) time-series data of the angle of the ankle to the level surface.

Results

The smaller the speed of the forward and backward movement of the legs is, the lower walking ability of the subjects is as shown in Fig.2. And, the lower the speed of angular velocity of the subject is, the lower walking ability of the subjects is, in movement Fig.1(b). Moreover, in the both movements the more constant the rhythm of the movement is, the higher the capacity of walking ability is.