Analysis of the Factors Influencing the Hopping Height During Two-legged Hopping in the Place in Healthy Subjects: With Special Reference to the Posture and Movement of the Trunk and Lower Limb

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**Purpose:** The purpose of this study was to reveal correlations between the posture and movement of the trunk and lower limbs and the hopping height in the ground contact phase of two-legged hopping in the place and to clarify factors influencing the hopping height.

**Methods:** The subjects were 19 healthy males. The hopping at 130 of motion pitch per minute was measured by using a three-dimensional motion analysis system and a force plate. The ground contact phase was divided into the first-half and latter-half phases on the basis of a point of the time when the hip reached its lowest level in a vertical direction (point of lowest hip joint level), then correlations between the following parameters and the hopping height were analyzed: Postures at the ground contact point, point of lowest hip joint level, and takeoff point; motion range in the first-half and latter-half phases; and timing of motion direction change-over (motion change-over time).

**Results:** There were correlations of the hopping height with the heights of the hip at point of lowest hip joint level, the motion range of the thorax and hip joint in the first-half phase, the moving range of the hip joint in the first-half and latter-half phases, and with motion change-over time for the thorax and the knee joint. Two parameters, i.e., motion change-over times for the knee joint and the moving range of the hip joint in the latter-half phase, were extracted as predictive factors for the hopping height.

**Conclusion:** The factors of determination of the hopping height were revealed to be only the parameters involved with lower limb, though movement of the thorax and lower limb was correlated with the hopping height.