

## 脊髄損傷者の車椅子テニス実施時における 体温調節反応に関する研究

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### Body Temperature Regulation During Playing Wheelchair Tennis in Persons with Spinal Cord Injury

by

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#### ABSTRACT

The purpose of this study was to clarify the relationship between body temperature and the level of injury in persons with spinal cord injury (PSCI) during wheelchair tennis. Eleven male PSCI with lesions located between C8 and L2 participated in this study. The PSCI performed wheelchair tennis for 90min including warming up (10min), stroking (20min), volleying (10min), receiving (10min), serving (10min) and game (30min). The experiment was carried out on fine days from the end of June to the beginning of July. The ambient temperature and relative humidity were 31.7 to 34.2 °C and 43 to 67 %, respectively. The tympanic membrane temperature (Tt), skin temperatures (Tsk) at four points, and heart rate (HR) were continuously measured throughout the experiment. The PSCI at C8 complained of a headache at the beginning of the experiment because of the heat. For this reason, he stopped playing wheelchair tennis. The PSCI were divided into two groups according to the responses of body

temperature; one of them included the PSCI above Th7, 8 and the other below T11. The PSCI with lesions above Th7, 8 showed not only higher Tt and Tsk but higher HR in comparison with those with lesions below T11. The higher Tt and Tsk are attributable to a reduced skin vasomotor response in the paralyzed area and the small sweating area in the PSCI with lesions above Th7, 8.

## 要 旨

本研究の目的は車椅子テニスを実施している脊髄損傷者（脊損者）の体温変動を観察し、脊髄損傷（脊損）レベルと体温変動の関係を明らかにすることである。被験者は頸髄損傷者（C8）1名、胸髄損傷者8名（Th4-Th12）、および腰髄損傷者2名（L1, L2）の合計11名であった。測定は6月下旬から7月上旬にかけ、晴天の日を選んで実施した。測定期間中、環境温度は31.7から34.2℃および相対湿度は43から67%の範囲であった。車椅子テニスは準備運動を含めて90分間実施した。運動中、鼓膜温、皮膚温（胸部、上腕部、大腿前面部および下腿前面部）、車椅子走行距離、速度および心拍数を記録した。被験者C8は暑さのために準備段階において頭痛を訴えたために、その後の車椅子テニスを断念せざるを得なかった。脊損レベルがTh7, 8より上位の脊損者では、脊損レベルがTh11以下の被験者と比較して、鼓膜温および皮膚温とも高い値を示した。Th7, 8より高位の脊損者では麻痺部が上半身にもおよぶことから発汗部位が狭く、さらに麻痺部の皮膚血管拡張が起こらないために、鼓膜温および皮膚温の上昇が著しかったものと考えられた。