

野球選手の着衣条件からみた熱中症予防に関する研究 (アンダーシャツ素材を中心に)

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The Study of Clothing in Baseball Players with Particular Reference to Underwear for Prevention of Heat Accumulation

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ABSTRACT

To clarify the effects of the polyester underwear for prevention of heat accumulation under the heat environment in baseball, two series of exercise experiments were carried out at an ambient temperature of 35 °C, and 60% of relative humidity. In the first experiment, the thermoregulatory responses under three clothing conditions were compared: nude, 81% polyester baseball undershirt with tight clothing (PE), and 81% cotton baseball undershirt with loose clothing (CT) on the upper body and with common swimming pants, on the lower body. In the second experiment, the thermoregulatory responses under the corresponding three clothing conditions with baseball uniform and socks on the lower body were compared: nude on the upper body, the 81% polyester undershirt with layered wearing of baseball uniform (PE uniform), and the 81% cotton undershirt with layered wearing of baseball uniform (CT uniform) on the upper body. Heart rate (HR), rectal temperatures (Tre), skin temperatures, total sweat volume (TSV), effective sweat volume (ESV) and subject votes (thermal, comfort, skin humid sensations) were measured in each

experimental condition.

In Experiment 1, the Tre rose most in the CT condition than the other two conditions. This was due mainly to increased effective sweat rate (ESV/TSV) in the PE condition. On the other hand, in Experiment 2, the rise of Tre was not different between PE uniform and CT uniform conditions. Above results showed that the polyester undershirt with clothing pressure was effective in reducing the thermal load than the conventional cotton undershirt, but the effect disappeared with layered wearing. The layered wearing in baseball activity for prevention of the heat accumulation remained to be studied.

要 旨

スポーツ活動時の熱中症発生率の最も高い野球のアンダーシャツに焦点をあて、近年開発されているポリエステルアンダーシャツの熱中症予防に関する有効性を体温調節反応から解明することを目的として暑熱環境下における運動負荷実験を行った。実験1では着衣条件を上半身裸体、ポリエステル素材のアンダーTシャツ (PE)、従来の綿素材のアンダーTシャツ (CT) (ともに下半身は競泳パンツ) の比較を行った。その結果、CTは裸体条件と比較して体温がより上昇したが、PEでは体温上昇の抑制効果が示された。これは主に総発汗量が裸体<PE=CTであったが、発汗効率がとくにCTにおいて低下し、PEではその低下を軽減する効果が認められたことによるものであった。実験2では着衣条件をよりスポーツ活動現場に近い設定として、下半身はユニフォーム、上半身は裸体、ポリエステルアンダーシャツにTシャツ重ね着、綿アンダーシャツにTシャツ重ね着の3条件の比較を行った。その結果、実験1で示されたようなポリエステルアンダーシャツの体温上昇抑制効果は消失した。この結果は、アンダーシャツにユニフォームを重ね着していることが主原因であり、今後この重ね着について検討することが熱中症の予防に必要であると考えられた。