# 水着の形状が水泳中の体温調節反応に及ぼす影響

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# Influence of the Long Type Swimsuits on the Thermal Responses During Swimming

by

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**ABSTRACT**

The purpose of this study was to clarify the thermal effect of wearing the long type swimsuits (bodysuits) during prolonged swimming. The subjects were 12 male college competitive swimmers aged 20.2 ± 1.3 yr, height 174.0 ± 6.4 cm, body weight 69.1 ± 7.7 kg, %Fat 17.7 ± 3.1 %. All the subjects trained regularly for 2-3 hours a day, 5-7 times in a week. They were informed of the aims, risks, and benefits of this investigation both verbally and in writing prior to signing an informed consent document. The subjects swam 1500 m in front crawl stroke with two type of competitive swimsuits (6 subjects : regular swimsuit group, 6 subjects : bodysuit group). The temperature logger ( 3650, HIOKI, Japan) were attached on the swimmer's calf, thigh, abdomen, chest, and forearm. Those skin temperatures were

measured throughout the swimming at minute intervals. Body temperature (oral:Tb), rating of perceived exertion (RPE), and perceived thermal sensation of head (TSH) and body (TSB) were measured on completion of the swimming. Mean skin temperature during swimming for BODYSUIT group and REGULAR group were 33.0 ± 0.38 and 32.6 ± 0.35, respectively ($p<0.05$). There were significant differences in TSB(6.5 ± 0.8, 5.6 ± 0.2) and TSH(7.1 ± 0.3, 5.9 ± 0.6) for BODYSUIT group and REGULAR group, respectively ($p<0.05$). These results suggested that this small temperature logger makes it possible to measure skin temperature during swimming. The thermal responses to swimming wearing the long swimsuits were significantly higher than wearing the regular swimsuits. Therefore, swimmers might be required to pay attention to wear the long swimsuits during prolonged/high intensity swimming in the environment of warm water.

## 要　旨

本研究では，水着の形状が水泳中の体温調節反応に及ぼす影響を明らかにすることを目的とした．日頃からトレーニングを行っている大学水泳選手12名を被験者とした．被験者の年齢，身長，体重，体脂肪はそれぞれ 20.2 ± 1.37 yr, 174.0 ± 6.41 cm, 69.1 ± 7.72 kg, 17.7 ± 3.10 %であった. 実験に先立ち本実験の目的，安全性，予想される結果について書面および口頭で説明し，被験者として本実験への参加承諾を得た．皮膚温測定のための温度測定装置（温度ロガー3650；センサー部, 2040 データメモリー，電池内蔵，日置社製）を下腿部，大腿部，腹部，胸部，前腕にテープで貼り付け，水泳中１分ごとにデータを取得した．通常の水着群（RS群）6名とロングタイプ水着群（BS群）6名にクロールで1500m泳を行わせ，泳前後の体温（口腔温），水泳中の皮膚温，泳直後の心拍数，RPE，温度感覚（頭部，躯幹部）を測定した．その結果，テスト泳後半（10分後，15分後）の平均皮膚温，テスト泳後の主観的指標である頭部（TSH），躯幹部（TSB）の温度感覚において，BS群が有意に高い値を示し，水着の形状の違いによって，水泳中の体温調節反応に違いが認められた．本研究でのプール温度条件であった30℃前後の水温でのロングタイプ水着を着用した水中トレーニングでは，高体温や脱水を引き起こさないように十分な水分摂取を行う必要がある．今後，水温および泳速度による影響，さらにスイミングキャップの素材の違いが，体温調節反応および水泳パフォーマンスに及ぼす影響についての検討を行いたい．