

## 音楽が超最大運動での performance および 血中物質におよぼす影響

国立長寿医療 山本 貴子  
研究センター  
(共同研究者) 名古屋大学 佐藤 祐造

### **Effects of Listening to Slow- and Fast-Rhythm Music prior to Supramaximal Cycle Exercise on Performance and Blood Parameters**

by

Takako Yamamoto  
*National Institute for Longevity Sciences*  
Yuzo Sato,  
*Research Center of Health, Physical Fitness, and Sports*  
*Nagoya University*

#### **ABSTRACT**

We examined the effect of listening to two different types of music ( slow- and fast-rhythm ) prior to supramaximal cycle exercise on performance, heart rate, the concentration of lactate and ammonia in blood, and the concentration of catecholamines and cortisol in plasma. Six male swimmers, aged  $24.0 \pm 4.0$  ( Mean  $\pm$  SD ) years voluntarily participated in this study. After listening to slow-rhythm or fast-rhythm music for 20-minutes, the participants performed supramaximal exercise for 45 seconds using a cycle ergometer. The mean power output was measured during the exercise, while the blood lactate and ammonia concentrations and the plasma adrenaline, noradrenaline, and cortisol concentrations were measured before, immediately before the end of, and immediately after listening to the music, and 2.5, 5.0, 7.5, and 10 min after the exercise. The mean power output was  $527.3 \pm 33.4$  watts when the music type was slow rhythm and  $527.5 \pm 33.6$  watts when it was fast-rhythm. The type of music thus had virtually no impact on power output during the exercise.

The plasma noradrenaline concentration immediately before the end of listening to slow-rhythm music was significantly lower than before listening to the music ( $p < 0.05$ ). The plasma adrenaline concentration immediately before the end listening to fast-rhythm music was significantly higher than before listening to the music ( $p < 0.05$ ). The type of music had no effect on the blood lactate and ammonia concentrations, or on the plasma catecholamines and cortisol concentrations following the exercise. In conclusion, listening to slow-rhythm music prior to supramaximal exercise decreased the plasma noradrenaline level, and listening to fast-rhythm music prior to supramaximal exercise increased the plasma adrenaline level. The type of music did not affect performance.

## 要 旨

本研究は運動前に速いリズムまたは遅いリズムの音楽を聴くことが、超最大運動のパフォーマンスおよび運動後の心拍数、血中乳酸、アンモニア、カテコールアミン、コルチゾール濃度に影響をおよぼすのか検討することを目的として行った。男子大学生6名を対象に、安静状態において両タイプの音楽を20分間聴かせた後、自転車エルゴメーターにて45秒間の超最大運動を行わせた。安静状態にて遅いリズムの音楽を聴くと、音楽聴取終了直前の血漿ノルアドレナリン濃度は聴取前より有意に低下し、速いリズムの音楽を聞くと血漿アドレナリン濃度が有意に増大した。両タイプの音楽を聴いた後に超最大運動を行った結果、その平均仕事率に有意差は認められなかった。どちらの音楽を聴いても、運動後の血中乳酸、アンモニア、カテコールアミン、コルチゾール濃度は有意に増加したが、音楽の違いによる差は認められなかった。

これらの結果から、遅いリズム音楽を聴くと血漿ノルアドレナリン濃度は減少し、速いリズム音楽を聴くとアドレナリン濃度は増大するが、異なったリズム音楽の聴取は超最大運動での仕事率に影響を与えなかった。