

台灣優秀男子網球選手單打比賽生理負荷與

比賽時間分析之探討

2009 年 7 月

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摘要

目的：探討台灣男子網球單打比賽選手生理負荷與比賽時間分析。觀察變項包括比賽中選手心跳率、血乳酸值及 RPE 自覺量表的變化；分析比賽總時間、有效擊球時間、每一分來回時間、每一分擊球次數及運動休息時間比等。方法：邀請 98 年度全國男子網球排名前 32 之 8 名選手為受試者（年齡 20.87 ± 1.72 歲；身高 179.75 ± 4.43 公分；體重 71.37 ± 6.94 公斤）進行八強三盤二勝單淘汰制邀請賽。比賽全程受試者需配帶無線心跳錶監測整場比賽之心跳率變化，賽前測量受試者安靜時心跳率、血乳酸及 RPE 值，每一盤結束後和賽後五分鐘進行血乳酸檢測，以及賽後進行 RPE 自我檢測。賽後觀看所拍攝之比賽過程及分析所觀察之變項。結果：以單因子變異數分析比較賽前安靜值與第一盤、第二盤平均心跳率發現，第二盤平均心跳率 168.96 ± 7.82 bpm 顯著高於第一盤 164.11 ± 8.4 bpm ($p < .05$)。血乳酸部分以單因子變異數分析考驗後發現，第一盤與第二盤結束後血乳酸值分別為 3.44 ± 1.14 mmol · L⁻¹ 及 3.29 ± 1.18 mmol · L⁻¹ 均顯著高於賽前 2.26 ± 0.73 mmol · L⁻¹ ($p < .05$)；RPE 賽前平均值為 6.56 ± 1.36 ，賽後為 15.18 ± 1.72 。結論：網球比賽選手生理負荷變化不單只因運動強度有所變化，仍需考量天氣溫度變化、場地材質與選手打法不同。往後的研究能將場地材質列入比較，方能建立選手更完全的生理數據。

關鍵詞：網球、心跳率、血乳酸值、RPE

To Examine the Game Characteristics and Physiological Responses during Tennis
Competition in Man's Single Matches in Taiwan.

July, 2009

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Abstract

Purpose: The aim of this study was to examine the game characteristics and physiological (ie, blood lactate concentration and heart rate) and perceptual (ie, rating of perceived exertion, RPE) responses during tennis competition in man's single matches in Taiwan. The variables describing the game characteristics of the matches, total match time; duration of rallies (DRs) ; effective playing time (EPT) ; work-to-rest ratio; shots per rally, were recorded by video recording. Methods: Eight trained and Taiwan's ranked (Chinese Taipei Tennis Association rankings) male tennis player (age 20.87 ± 1.72 yrs; height 179.75 ± 4.43 cm; weight 71.37 ± 6.94 kg) were studied during single matches (best of three sets) played on an outdoor hard court surface during an invitational tournament. HR was measured continuously during each match. Blood lactate concentration was determined before the match, at the end of every set and after 5 minutes end of the match. RPE was determined before the match and end of the match. Results: There were significant ($p < .05$) differences as follows: 2nd Set HR 168.96 ± 7.82 bpm > 1st set HR 164.11 ± 8.4 bpm; 1st and 2nd blood lactate 3.44 ± 1.14 and 3.29 ± 1.18 mmol \cdot L⁻¹ > before the match 2.26 ± 0.73 mmol \cdot L⁻¹ ($p < .05$). RPE values were 6.56 ± 1.36 before the match and the end of match were 15.18 ± 1.72 . Conclusions: The alter of physiological responses does not only affect in exercise intensities for professional tennis players the weather, change of temperature, texture of the tennis courts and the play style of different players are also included. The further research would include the texture of the tennis courts for comparison, in order to create a suitable and balanced physiological values statement for players.

Key words: tennis, heart rate, blood lactate concentration, RPE