DOI:10.29461/TGGa.202308_18(3).0002

老年患者發燒時腕溫特性：應用於穿戴裝置監測之探討

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摘要

目的：本研究旨在初探老年患者發燒症狀時腕溫的變化特性，以作爲預測發燒變化之可行性。

方法：本研究爲一觀察性試驗，以方便取樣方式收集具有發燒症狀之住院患者，分析其核心溫度（耳溫，使用百靈耳溫槍（ThermoScan® 7 IRT6520, Braun, Germany）測量）和腕溫（使用經黑體校正的 Fluke 工業紅外線溫度測量儀（62 MAX+ Infrared Thermometer, Fluke, USA）測量）於發燒時之變化。

結果：本研究共分析 23 位 (男性 13 位，女性 10 位) 老年發燒患者，平均年齡爲 69.7 歲。發燒時腕溫與耳溫大致呈相同方向變化，平均值爲耳溫 38.20℃，腕溫爲 35.67℃，但腕溫相對於耳溫有延遲或不同步的變化。模擬正常溫度時，腕溫變化率較耳溫變化爲高，然在偵測到「轉換的耳溫」溫度高於 37.5℃時，則耳溫的準確率仍優於腕溫。

結論：腕溫在穿戴裝置的應用或可作爲長時間的發燒監測，以提供住院患者得到更即時的照護，然對於接近發燒狀態時仍宜使用耳溫測量較爲準確。

(臺灣老年醫學暨老年學會雜誌 2023；18(3)：178-190)

關鍵詞：體溫監測、老年人、發燒、皮膚溫度、腕溫

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DOI:10.29461/TGGa.202308_18(3).0002

Characteristics of Wrist Temperature During Fever in Elderly Patients: An Exploration of Wearable Device Monitoring Application.

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Abstract

Objectives: The study aims to preliminarily explore the characteristics of wrist temperature changes in elderly patients during fever episodes as a feasible means for predicting fever.

Methods: This observational study used convenience sampling to collect data from hospitalized patients with fever and analyzed the changes in their core temperature (ear temperature, measured with a Braun ear thermometer (ThermoScan® 7 IRT6520, Braun, Germany)) and wrist temperature (measured with a Fluke industrial infrared thermometer (62 MAX+ Infrared Thermometer, Fluke, USA) calibrated for blackbody radiation) during fever episodes.

Results: A total of 23 elderly patients (13 males and 10 females) with fever were analyzed, with an average age of 69.7 years. Our results showed that wrist temperature generally changed in the same direction as ear temperature during fever, with average temperatures being 38.20 ℃ for ear temperature and 35.67 ℃ for wrist temperature. However, wrist temperature changes were delayed or asynchronous compared to ear temperature. Additionally, under normal temperature conditions, the rate of change in wrist temperature was higher than that of ear temperature. However, when the 'converted ear temperature' exceeds 37.5℃ , ear temperature remain more accurate than wrist temperature.

Conclusion: The application of wrist temperature in wearable devices can be used for long-term fever monitoring to provide more immediate care for hospitalized patients. However, when in fever state, ear temperature measurements are still advisable for more accurate results.

(Taiwan Geriatr Gerontol 2023; 18(3): 178-190*)*

Key words: Body temperature monitoring, Elderly, Fever, Skin temperature, Wrist temperature.

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