# 第二型糖尿病患之白袍效應與相關因子
## Correlates of White-Coat Effect in Patients with Type II Diabetes.

## 中文摘要

本研究目的旨在探討第二型糖尿病患之白袍效應與相關因子，及心率變異性測量對於第二型糖尿病患發生白袍效應的預測能力。於北台灣北部某一門診收案，受試者包括 34 位（23 到 70 歲）規律服用降血糖藥物且未接受過高血壓藥物治療的第二型糖尿病個案。研究變項包括飯前血糖、糖化血色素、總膽固醇、三酸甘油酯數值及體位測量，並在晨間安排心率變異性、三項心血管自主神經功能測試與握力壓力測試值；透過動態血壓測量儀（SpaceLabs 90207, Redmond, WA）取得臨床血壓與居家血壓值，以 BioPacMP100 訊號擷取系統分析心跳間距與心率變異頻譜，由連續性血壓測量儀（Finometer, TNO Biomedical Instrumentation, Amsterdam, Netherlands）取得心血管參數，所有資料以 SPSS 11.0 套裝統計軟體進行分析。以臨床收縮壓值減去 ABPM 日間收縮壓差值分為三組，大於等於 5 mmHg 為白袍效應組，小於 5 mmHg 但大於-5 mmHg 為無白袍效應組，小於等於 -5 mmHg 為反向白袍效應組。

依據本研究對白袍效應之定義，白袍效應組佔 38.2 %，無白袍效應組佔 32.4 %，反向白袍效應組佔 29.4 %。三組間在人口社會學及生化因子之比較以 ANOVA 分析並以 LSD 作事後比較，結果顯示：白袍效應組之糖尿病史顯著較他組長；反向白袍效應組比白袍效應組之三酸甘油酯顯著較高；臨床收縮壓值以白袍效應組較反向白袍效應組高；而日夜間血壓差值則以反向白袍效應組較白袍效應組高；無白袍效應組在心率變異性高頻功率與總功率項皆比其他兩顯較高。經線性迴歸檢定臨床收縮壓值、日夜間血壓差值及心率變異性總功率可獨立預測第二型糖尿病患之白袍效應，三者對於白袍效應之變異量的解釋力為 39.7 % （p = .001）。本研究確認了第二型糖尿病患發生白袍效應的相關因素，且證實心率變異性對於第二型糖尿病患發生白袍效應是具有預測性的。


## 英文摘要

The purpose of this study was to examine (1) the correlates of white-coat effect in patients with type II diabetes mellitus and (2) the predictive power of heart rate variability (HRV) in predicting the size of the white coat-effect in type II diabetics.

Thirty-four male and female type II diabetics, aged 20 to 70, who had never been treated with antihypertensive medications, were recruited from the Outpatient Department of a hospital located in northern Taiwan. The biochemical variables included fasting blood sugar, HbA1C, cholesterol, and triglyceride. Resting HRV, tests of cardiovascular autonomic neuropathy, and handgrip stress test were employed in a morning session. Clinic blood pressure (BP) was measured by an automatic BP

recorder (SpaceLabs 90207, Redmond, WA). Ambulatory BP monitoring (APBM) was carried out using the SpaceLabs BP monitor during two 24-hour periods in a day representing the participant's typical day of the week. White coat effect (WCE) was calculated by subtracting the ABPM daytime systolic BP (SBP) from the clinic SBP. Participants were grouped according to the size of their WCE. Those who showed a WCE of 5mmHg and above were assigned to the WCE group; those who showed a WCE of between -5 and 5 mmHg were assigned to the no white coat effect (NWCE) group; those who exhibited a WCE of -5mmHg and lower were assigned to the reverse white coat effect (RWCE) group.

Based on the grouping criteria, 38.2 % of the participants were categorized as WCE, 32.4 % as NWCE and 29.4 % as RWCE. A comparison of socio-demographic and biological variables among three groups with ANOVA and post hoc LSD revealed that: the WCE group had significantly longer DM history than other groups; the RWCE group had a significantly higher triglyceride level than the WCE group; the WCE had significantly higher clinic BP than the RWCE group; the NWCE group had higher day-night SBP difference than the WCE group; the NWCE group had significantly higher HRV in high frequency and total power than other groups. The linear regression model showed that clinic SBP, day-night SBP difference, and HRV TP independently predict the size of the WCE in type II diabetics ($R^2$ = 39.7 %, p = .001).

This study identified correlates of the WCE and demonstrated that HRV is useful in predicting the size of the WCE in type II diabetics.