

中文題目：在一項大型台灣族群研究探討肝功能指數和新發生糖尿病的性別差異

英文題目：Sex difference in the associations among liver function parameters with incident diabetes mellitus in a large Taiwanese population follow-up study

作者：陳逸剛¹，陳思嘉^{2,3}，張哲銘³

服務單位：¹高雄醫學大學附設醫院內科部，²高雄市立小港醫院內科，³高雄醫學大學附設醫院腎臟內科

Background: The prevalence of diabetes mellitus (DM) in Taiwan between 2017 to 2020 was 11.05% which is high than the global prevalence (10.5%). Previous studies had showed that liver enzymes were high with DM patients than who do not have DM. However, few studies have evaluated sex differences in the relationships between liver function parameters and incident DM. Therefore, this longitudinal study aimed to investigate sex differences in the correlations among liver function parameters, including glutamic-oxaloacetic transaminase (AST), glutamic-pyruvic transaminase (ALT), albumin, α -fetoprotein (AFP), total bilirubin, gamma-glutamyl transpeptidase (GGT), and incident DM in a large cohort of participants, around 27,000, in the Taiwan Biobank (TWB).

Methods: We identified 27,026 participants (male: 9552; female: 17,474) in the TWB with follow-up data for a median of 4 years, and excluded those with no follow-up data on DM or serum fasting glucose and HbA1c ($n = 43$), and those with baseline DM ($n = 2637$). The remaining 24,346 participants (male: 8334; female: 16,012) were enrolled, and the mean age was 50.5 ± 10.4 year-old. Participants with no past history of DM (self-reported) with a fasting glucose less than 126 mg/dL and glycosylated hemoglobin A1c (HbA1c) less than 6.5% were defined as not having DM. Those who developed DM (self-reported, fasting glucose ≥ 126 mg/dL or HbA1c $\geq 6.5\%$) during follow-up were defined as having incident DM.

Results: The participants were divided into two groups according to without incident DM ($n = 23,237$; 95.4%) or with incident DM ($n = 1109$; 4.6%). In the male participants ($n = 8334$), after multivariable analysis, high AST ($p < 0.001$), high ALT ($p < 0.001$), high albumin ($p = 0.003$), high AFP ($p = 0.019$), and high GGT ($p = 0.001$) were significantly associated with incident DM. In the female participants ($n = 16,012$), high AST ($p = 0.010$), high ALT ($p < 0.001$), high albumin ($p = 0.001$), low total bilirubin ($p = 0.001$), and high GGT ($p < 0.001$) were significantly associated with incident DM. There were significant interactions between total bilirubin and sex ($p = 0.031$), and GGT and sex ($p = 0.011$) on incident DM.

Conclusions: In conclusion, liver function parameters were significantly associated with incident DM. Further, there were differences in the associations between the male and female participants.