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Liver enzymes, fatty liver and type 2 diabetes mellitus in Jinchang Cohort

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Background: High levels of serum liver enzymes and fatty liver have been associated with increased risk of type 2 diabetes mellitus (T2DM) in some studies. It is unclear whether liver enzymes is the predictors of T2DM, which is independent for fatty liver.

Methods: A total of 48,001 subjects aged 19 to 90 participated in a baseline examination from 2011 to 2013 in Jinchang cohort. Among the subjects, 33,355 underwent follow-up examination from 2014 to 2015, for average follow-up period of 2.2 years. Cox proportional hazard models were used to examine the adjusted associations of ALT, AST and GGT with T2DM.

Results: The cumulative incidence of T2DM were 8.05% to 9.02% for fatty liver (FL) and 2.25% to 4.10% for Non-Fatty Liver (NFL), both giving a statistically significant difference. Compared with the normal liver enzyme level in FL group, the adjusted incident hazard ratios of T2DM were ALT 1.23 (95% CI: 1.10–1.50), AST 1.30 (95% CI: 1.07–1.59) and GGT 1.34 (95% CI: 1.08–1.65) in FL group. In addition, the adjusted hazard ratio of T2DM in the abnormal GGT rise of NFL group was significantly higher than that of the GGT normal of NFL group (HR=1.53, 95%CI: 1.19–1.98) by adjusting confounding factors and compared with normal ALT and AST in NFL group, the adjusted hazard ratios of T2DM were 1.27 (95% CI: 1.02–1.59) and 1.33 (95% CI: 1.02–1.59) respectively. There are significant interaction of T2DM hazard ratios between GGT and AST, GGT and AST (Pinteraction<0.05) in addition to ALT and AST.

Conclusions: The incidence of diabetes in the fatty liver group is significantly higher than that in the normal population and the serum AST, GGT and ALT levels rise are independent risk factors for fatty liver in the development of T2DM.

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