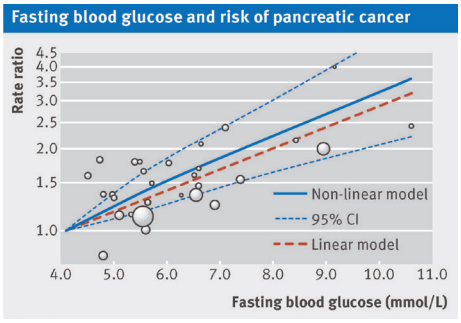
Fasting blood sugar and risk of pancreatic cancer

Elevated fasting blood sugar is associated with an increased risk of pancreatic cancer even in the prediabetic range

The incidence rate of the highly lethal cancer pancreatic adenocarcinoma is increasing. Epidemiological studies have linked type 2 diabetes to pancreatic adenocarcinoma, but the link between blood glucose and pancreatic cancer remains controversial. Dr. Wei-Chih Liao, an attending physician at National Taiwan University (NTU) hospital, has conducted a systematic review and dose-response meta-analysis of the relationship between blood glucose concentration and the risk of pancreatic cancer, which was published in BMJ on January 2, 2015. The analysis demonstrated that the incidence rate of pancreatic adenocarcinoma increases linearly with increasing fasting blood glucose in both prediabetes and diabetes. This study is part of Dr. Liao's PhD work supervised by Associate Professor Yu-Kang Tu and Professor Kuo-Liong Chien, both at the Institute of Epidemiology & Preventive Medicine, College of Public Health.



Nine observational studies with a total of 2,408 pancreatic cancer patients among 2,989,500 subjects were included in this meta-analysis. A random-effects dose-response meta-analysis was conducted to explore potential linear and nonlinear dose-response relationships between blood glucose and the incidence rate of pancreatic cancer.

There was a strong linear relationship between fasting blood glucose and the incidence rate of pancreatic in both pre-diabetes and diabetes, without a significant nonlinear association. The pooled pancreatic cancer rate ratio per 10 mg/dL increase in fasting blood glucose was 1.14 (95% confidence interval: 1.06 to 1.22; P<0.001) across the blood glucose range between 73.9 mg/dL and 191 mg/dL.

Sensitivity analysis excluding blood glucose categories in the range of diabetes yielded similar results (pooled rate ratio per 10 mg/dL increase in fasting blood glucose: 1.15; 95% confidence interval: 1.05 to 1.27; P=0.003), thus strengthening the association between pre-diabetes and pancreatic cancer. No significant heterogeneity or outlying studies were found. The results of gender-specific analyses were consistent with those of the main analyses combining both genders and also revealed a linear dose-response relationship.

In conclusion, every 10 mg/dL increase in fasting blood glucose is associated with an average increase in the incidence rate of pancreatic cancer of 14%. Pre-diabetes is also a risk factor for pancreatic cancer. Because prediabetes precedes type 2 diabetes by years and can be improved or reversed by lifestyle changes, pre-diabetes may provide an important window of opportunity for pancreatic cancer prevention.

Reference

Wei-Chih Liao, Yu-Kang Tu, Ming-Shiang Wu, Jaw-Town Lin, Hsiu-Po Wang, Kuo-Liong Chien. Blood glucose concentration and risk of pancreatic cancer: systematic review and dose-response meta-analysis BMJ 2015; 349:g7371. DOI: http://dx.doi.org/10.1136/bmj.g7371

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