A Standardized Triglyceride and Carbohydrate Challenge
The oral triglyceride tolerance test

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OBJECTIVE—A standardized method of assessing postprandial triglyceride changes is not available. We evaluated an oral triglyceride tolerance test (OTTT) designed for routine clinical and research use.

RESEARCH DESIGN AND METHODS—A 200-ml strawberry-flavored test drink (50 g fat, 50 g carbohydrate) was administered twice to 30 diabetic and 20 nondiabetic subjects. Venous plasma triglyceride and glucose levels were measured when fasting and every 2 h for 8 h after the drink. Fingerprick plasma triglyceride levels were measured when fasting and at 6 and 8 h after the drink.

RESULTS—The drink was consumed within 3 min and well tolerated by all subjects. The median triglyceride rise at 6 h was similar in diabetic and nondiabetic subjects (0.23 vs. 0.42 mmol/l, NS) and correlated with glucose increase at 2 h ($r = 0.429$, $P = 0.018$ and $r = 0.509$, $P = 0.026$; respectively). Diabetic subjects had higher 6-h geometric mean (1 SD range) triglyceride levels (1.82 [1.87 to 3.23] vs. 1.11 [0.66 to 1.11 mmol/l], $P < 0.003$) but a similar coefficient of variation (17.5 vs. 17.0%, NS) and a similar median (interquartile range) time to achieve maximal concentration (Tmax) (6.0 [4.0 to 6.0] vs. 5.0 [4.0 to 6.0] h, NS). Capillary triglyceride values were equivalent to simultaneous venous samples but consistently 10% greater.

CONCLUSIONS—The OTTT permits simple evaluation of postchallenge triglyceride levels, is acceptable to subjects, and can be performed with capillary sampling. It could be used to monitor triglyceride-lowering therapies and to provide additional information concerning cardiovascular disease risk, particularly in diabetic subjects.

Abbreviations: apo, apolipoprotein • AUC, area under the curve • CHD, coronary heart disease • IAUC, incremental AUC • IQR, interquartile range • OTTT, oral triglyceride tolerance test