A Standardized Triglyceride and Carbohydrate Challenge
The oral triglyceride tolerance test

Nina Mohanlal, MBBS and Rury R. Holman, FRCP

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