Objective: To evaluate an appropriate cutoff level of single plasma glucose value of a normal 100-gram oral glucose tolerance test (OGTT) in early pregnancy (within 20 weeks), which can predict gestational diabetes mellitus (GDM) diagnosed from the second OGTT in late gestation (28-32 weeks). Methods: Blood tests of high-risk pregnancies for GDM, who had had normal OGTTs in early pregnancy and who underwent a second test in late gestation were studied. Each plasma glucose level among the four values from the first OGTT was determined for sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and the receiver-operating characteristic (ROC) curve to find the optimal value to predict GDM which was subsequently diagnosed from the second OGTT. Results: From 188 pregnancies who had had normal result from their early OGTTs, 152 women still had normal second OGTTs at 28-32 weeks’ gestation while 36 were diagnosed as GDM. Among the four values of early OGTT, the plasma glucose at one hour yielded the best diagnostic performance to predict abnormal late OGTT (GDM). At the optimal cutoff level of 1-hour plasma glucose \( \geq 155 \text{ mg/dL} \) (8.6 mmol/L), the sensitivity, specificity, PPV, NPV, and area under the ROC curve were 88.9%, 64.5%, 37.2%, 96.1%, and 0.767 respectively. Conclusions: With a high NPV of 1-hour OGTT below 155 mg/dL in early pregnancy, pregnant women would have low probability to develop late-onset GDM. By application of this predictive indicator, a considerable number of high-risk women could avoid a second test during late gestation.