Aim: Decreased insulin sensitivity (SI) is important in the pathogenesis of type 2 diabetes (T2DM). Caumo et al. have developed an equation to calculate SI from 300 mins-75 g oral glucose tolerance test (OGTT300). The aim of the study was to assess the accuracy of SI estimation by using Caumo's equation in OGTT120 and 180. Methods: Fifty subjects were enrolled (17 normal glucose tolerance, 14 pre-diabetes and 19 T2DM). They underwent both frequently sampled intravenous glucose tolerance test (FSIGT) as a standard for SI and OGTT120 and 180. In Caumo's original hypothesis, the plasma glucose and insulin at 300 min (G300 and I300) should all return to the basal state (Gb, Ib). In the meanwhile, G120 and 180 and I120 and 180 would be either higher or lower than Gb and Ib. Dependent on whether to add or minus the estimation area under curve (AUC) at basal state, four methods were investigated: 1. Method 1: add estimation AUC higher than basal and minus estimation AUC lower than basal; 2. Method 2: add estimation AUC higher than basal only; 3. Method 3: minus estimation AUC lower than basal only; 4. Method 4: neither add estimation AUC higher than basal nor minus estimation AUC lower than basal. Results: Both SI180 and SI120 were only significantly correlated with SI of FSIGT by method 3 (r = 0.623, p < 0.001 and r = 0.559, p < 0.001, respectively). Other methods were unable to estimate the SI correctly. Conclusions: Our results showed that SI could be accurately calculated in subjects with a varying degree of glycemia by using modified Caumo's equation.