Applicability of homeostasis model assessment of insulin resistance to patients with hyperglycemia

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Dear Editor,

Iki and colleagues conducted a cross-sectional study if serum undercarboxylated osteocalcin levels were inversely associated with fasting plasma glucose (FPG), hemoglobin A1c, and homeostasis model assessment of insulin resistance (HOMA-IR) levels in elderly Japanese male inhabitants [1]. Regarding basic characteristics of variables they used for the analysis, I have two queries as follows.

First, in addition to three markers for bone turnover, the levels of glucose metabolism also showed log-normal distribution. In their Table 2, the levels of lipid metabolism also showed log-normal distribution. I agree the log-normal distribution of serum insulin, triglyceride, and HOMA-IR in general habitants, but other variables on glucose and lipid metabolism distribute normal form from my experience. On this point, the characteristics of their population should be explored to check validation on the representativeness of the Japanese male inhabitants.

Second, HOMA-IR has a limitation as an indicator of insulin resistance. Iki and colleagues quoted the original reference [2]. Thereafter, an advanced procedure has been distributed [3], and some problems of HOMA-IR for the reflection of insulin resistance had been reported [4, 5]. As a basic point, applicability of HOMA-IR for insulin resistance should be limited in subjects with fasting plasma glucose of 140 mg/dl or lower, which was based on the correlation analysis based on hyperinsulinemic-euglycemic clamp and the hyperglycemic clamp methods. When upper 2.5 % value

of FPG is calculated by the equation as geometric mean multiplied by the square value of geometric standard deviation, it becomes 146 mg/dl. The HOMA-IR should be handled with caution in their study.

Although they did not use HOMA-IR as a dependent variable of logistic regression analysis as a main outcome, the basic information on statistics and application of biological indicator should be clarified to keep validation of their study.

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