Editorial

Aging may Affect Insulin Action Independent of Adiposity in Non-Diabetic Subjects

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These findings are reasonable because elderly subjects have reduced physical activity, and they use less body energy compared with younger subjects. Moreover, several hormones that affect the quantity and quality of fat, e.g., growth hormone/insulin-like growth factor-1 and sex steroids, change with age⁴.

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Next, the authors evaluated the effects of aging on glucose tolerance parameters. Age was significantly negatively correlated with immunoreactive insulin (IRI), homeostasis model assessment of insulin resistance (HOMA-IR), and β-cell function (HOMA-β). In this study, HOMA-IR demonstrated weak but significant negative correlations with VFA and VFA/SFA in both males and females; however, these relationships disappeared after adjusting for age. Although the contribution of visceral fat or BMI on insulin resistance has been controversial⁵, ⁶, we did not expect these results, wherein age may have influenced insulin action independent of fat accumulation or distribution.

Adiponectin (APN) is an adipocytokine that enhances insulin sensitivity, and a reduced plasma level of this protein in subjects with visceral obesity reduces their insulin resistance⁷. A previous report revealed that centenarians who were more sensitive to insulin and less likely to have DM maintained higher APN plasma levels⁸. The authors measured high molecular weight (HMW)-APN, a beneficial form of APN, in a small number of participants. HMW-APN was negatively correlated with HOMA-IR and positively correlated with age. Importantly, HMW-APN demonstrated a much stronger negative correlation with HOMA-IR than with VFA. Thus, aging may be associated with higher plasma levels of HMW-APN, and this should ameliorate insulin resistance and reduce the necessary insulin amount, which is independent of VFA.

HOMA-IR or HOMA-β is an index calculated by fasting IRI and blood glucose. When fasting blood glucose does not change, as in this study, the reduction of IRI directly reflects the decrease of HOMA-IR.
their biological contribution of visceral fat may be greater. However, the current report by Hirose et al. proposed an interesting theory that aging can be an independent factor affecting IRI, HOMA-IR, and HOMA-β, despite it promoting visceral fat accumulation among healthy or health-conscious subjects (Fig. 1). This report may provide some information to understand the physiological mechanism of age-related glucose tolerance.

Conflicts of Interest
None.

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