The relationship between endogenous androgens and insulin resistance during the different stages of postmenopause

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Context  The effects of androgens on insulin resistance after menopause is very important, however the relationship is not clear now. Objective To determine the relationship between insulin resistance and endogenous androgens in early postmenopause and late postmenopause. Patients We enrolled postmenopausal women consisting of an early group (<=5 years since menopause, n=105) and an elder group (>=10 years since menopause, n=107). Each group was subdivided into normal weight (BMI <24 kg/m2), overweight and obesity (BMI>=24 kg/m2). Main Outcome Measures Fasting sex hormone-binding globulin (SHBG), testosterone(T), dehydroepiandrosterone-sulfate (DHEA-S), glucose,insulin levels were measured and then calculated free androgen index( FAI) and homeostatic model assessment of insulin resistance (HOMA-IR). The relationship between sex hormones and insulin resistance was estimated by partial correlation and multiple linear regression analyses. Results Compared to early postmenopausal women, late postmenopausal women had higher insulin and HOMA-IR but they had lower DHEA-S(all p<0.05).Both in early postmenopausal and late postmenopausal groups, overweight and obese women had higher HOMA-IR and insulin than women with normal weight(all p<0.05). In early postmenopausal group, overweight and obese women had lower SHBG and higher FAI than normal weight women(all p<0.05).In late postmenopausal group, overweight and obese women had higher DHEA-S(p<0.05). Partial correlation and multiple linear regression analyses suggested that: In early postmenopausal group, SHBG correlated negatively with insulin and HOMA-IR, DHEA-S correlated positively with glucose. In late postmenopausal group, FAI correlated positively with glucose. Conclusions The increased androgenic activities after menopause are associated with insulin resistance. These correlations are different during the different stages of postmenopause and mainly incarnate in: In early postmenopause low SHBG levels correlate with insulin resistance and high DHEA-S levels correlate with high blood glucose; in late postmenopause high FAI correlate with high blood glucose.

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