

MEETING ABSTRACT

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# Interactions of metabolic syndrome and thyroid hormones

Georg Brabant

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The prevalence of metabolic syndrome worldwide is high and rising (Alexander *Diabetes* 52: 1210, 2003; Cameron *Endocrinol Metab Clin North Am* 33: 351, 2004). According to all definitions visceral obesity, increased triglycerides, decreased HDL cholesterol, impaired glucose tolerance and increased blood pressure are part of the definition. Thyroid hormones impact on all these factors. In a large Chinese case control study all components of the metabolic syndrome were associated with systematically higher TSH levels (Lai *Endocr J* 58:23, 2011). Recent data on TH replacement following thyroidectomy further strengthen the close relation between TH status and body weight. Total thyroidectomy despite full replacement with T4 increases body weight by a mean of 2 kg above controls within 1 year (Jonklaas *Thyroid* 2011). When patients are treated with T3 instead of T4 to an identical 24 h mean of TSH body weight decreases by more than 2% within 1 year (Celi *JCEM* 96: 3466, 2011). The substantial effects of thyroid hormones on lipid components have been frequently reviewed (Duntas *Med Clin North Am*. 2012). Thyroid hormones are positively associated with insulin resistance not only in clinically diagnosed DM but also in subjects with a normal glucose tolerance. Indices of insulin resistance as judged by HOMA (which assesses fasting and postprandial insulin resistance) are closely linked to TH status. They modulate gluconeogenesis and peripheral glucose uptake (Duntas, Orgiazzi, Brabant *Clin Endocrinol* 2011). Finally, recent data from children and adolescents show a major impact of TH on the regulation of blood pressure. As other components of blood pressure dysregulation are less prominent at this age the small positive association of thyroid hormones with systolic and diastolic blood pressure support previous studies on the impact of TH status on blood pressure

regulation (Ittermann *JCEM* 97: 828, 2012). Thus, all components of the metabolic syndrome are altered by thyroid hormone status. Measurement of thyroid hormone status ought thus to be considered in any patient with metabolic syndrome or diabetes mellitus to rule out an easily manageable cofactor of the disease.

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Experimental and Clinical Endocrinology, MK I, University of Lübeck, Germany

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