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## Is thyroid function associated with masked hypertension?

To the Editor,

Masked hypertension (MHT) was first defined by Pickering in 1992, and its importance is progressively increasing (1). MHT is a condition wherein blood pressure measured according to hypertension guidelines in office is normal, whereas the mean 24-h ambulatory blood pressure measurement or blood pressure measurement out of office is high (2). Studies relating to the etiology of MHT is limited, and possible etiological factors include work stress, smoking, alcohol use, male sex, and excessive physical activity (3, 4). The association between MHT and thyroid hormone, which has major effects on the cardiovascular system, is not known. This study aims to investigate the association between thyroid hormone and blood pressure in newly diagnosed MHT patients.

In total, 712 patients without a previous diagnosis of hypertension and who were admitted to the outpatient clinic with hypertensive symptoms were enrolled. Patients were categorized into three groups, MHT, primary hypertension (PHT), and normotensive, according to the blood pressures measured at home and at the hospital. The mean systolic blood pressure (SBP) measured in office was <140 mm Hg and the mean diastolic blood pressure (DBP) was <90 mm Hg, whereas the mean measurements made at home were >135 mm Hg and >85 mm Hg, respectively; with these values, a diagnosis of MHT was made (2). Thyroid stimulating hormone (TSH), free-thyroxine (fT4), and free-triiodothyronine (fT3) levels were evaluated in 73 MHT, 73 PHT, and 74 normotensive participants using electrochemiluminescence immunoassay. The measurement device (Omron-M3, Omron-Healthcare Co. Ltd., Tokyo, Japan) was given to the participants, and they were instructed to measure blood pressure for 7 days, twice a day (2).

Of the 712 participants included in study, PHT in 206 patients, MHT in 73 patients, and normotension in 433 patients were determined. The mean SBP and DBP of patients with MHT and PHT were similar, whereas the mean SBP and DBP of the normotensive group were lower than those of the hypertensive groups. The mean log (TSH) level was higher, whereas the mean fT4 level was

lower in the PHT group as compared with the MHT and normotensive groups. Log (TSH) and fT4 levels were similar in the MHT and normotensive groups. The proportion of patients with hypothyroidism was higher in the PHT group as compared with the other groups (PHT: 17.8% vs MHT: 1.4% vs normotensive: 5.4%). Stepwise multiple regression analysis showed that mean SBP and DBP are associated with log (TSH), fT4, and presence of hypothyroidism in the PHT group. Such associations were not found in MHT and normotensive groups.

No associations were determined between patients with MHT and thyroid hormone. The finding that there was no association between MHT and thyroid hormone can be interpreted in two ways. First, the risk factors effective in the pathophysiology of MHT increase blood pressure independent of the levels of thyroid hormone. This hypothesis is supported by the fact that blood pressure increases during work stress and related etiological factors and is regulated during rest in patients with MHT (4). Second, thyroid hormone dysfunction may not cause MHT pattern (out of office) of high blood pressure and instead may lead to persistent hypertension pattern of high blood pressure.

**This abstract was presented as a poster presentation in the European Society of Endocrinology Congress (Dublin, 2015).**

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DOI:10.14744/AnatolJCardiol.2016.7197

