

Mildly elevated thyroid-stimulating hormone is associated with endothelial dysfunction and severe preeclampsia among pregnant women with insufficient iodine intake in Eastern Cape province, South Africa

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Abstract

Background

Preeclampsia and hypothyroidism are associated with endothelial dysfunction. Iodine deficiency is a risk factor for subclinical hypothyroidism in pregnancy. However, there is a paucity of data on the relationship between iodine nutrition state in pregnancy, the degree of endothelial dysfunction, and the risk of preeclampsia.

Methods

Ninety-five normotensive pregnant women, 50 women with preeclampsia with no severe features, and 50 women with severe preeclampsia were enrolled into the current study from the maternity units of Nelson Mandela Academic Hospital and Mthatha Regional Hospitals in Eastern Cape Province, South Africa.

Urinary iodine concentration (UIC), serum markers of thyroid function, aortic augmentation index, and pulse wave velocity (PWV) were compared.

Results

Median UIC was 167.5, 127.7, and 88.5 $\mu\text{g/L}$, respectively for normotensive pregnant women, those with preeclampsia and severe preeclampsia ($p = .150$). Participants with severe preeclampsia had significantly higher median thyroid-stimulating hormone (TSH) and oxidized LDL than normotensive and preeclamptic women without severe features (respectively 3.0, 2.3, and 2.3 IU/L; 1.2, 1.0, and 1.0 IU/L, $p < .05$). The median Aortic augmentation index was 7.5, 19.0, and 21.0 ($p < .001$), and the pulse wave velocity 5.1, 5.7, and 6.3, respectively for normotensive, preeclampsia, and severe preeclampsia participants (both $p < .001$). In linear regressions, TSH, age, and hypertensive disease were independent predictors of elevated PWV.

Conclusion

Upper normal-range TSH levels in women with severe preeclampsia were associated with markers of endothelial dysfunction. The low UIC and trend towards the elevation of thyroglobulin suggest that inadequate iodine intake may have increased TSH levels and indirectly caused endothelial dysfunction.

Keywords:

[Preeclampsia](#), [Iodine deficiency](#), [Elevated thyroid-stimulating hormone](#),
[Pulse wave velocity](#), [Endothelial dysfunction](#)

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