



## THYROID AND THE HEART

# High levels of some clotting factors may explain the association between high free T<sub>4</sub> and cardiovascular disease

### BACKGROUND

Thyroid hormone has major effects on the heart. It is well known that changes in thyroid hormone levels affect heart rate, heart muscle contractions and heart rhythms. Previous studies have shown that high and high-normal thyroid hormone levels are independently associated with increased risk of heart disease and death in middle-aged and older adults. However, the mechanisms by which this occurs are complex and not completely understood. This study examined whether certain clotting factors, such as von Willenbrand factor, ADAMTS13 and fibrinogen, play a role in the association of thyroid function with heart events and death.

### THE FULL ARTICLE TITLE

Bano A et al 2019 Thyroid function and cardiovascular disease: the mediating role of coagulation factors. *J Clin Endocrinol Metab* 104:3203–3212. PMID: 30938758.

### SUMMARY OF THE STUDY

The study included 5,918 adults aged 55 years and older selected from the Rotterdam Study, a population-based study in the Netherlands. Eligible participants included those with serum thyroid function measurements, coagulation data, and complete information on prevalent

cardiovascular events and death. Cardiovascular events included heart attack, other heart disease, stroke and death.

The average age of the participants was 69.1 years and 56.7% were women. Higher free T<sub>4</sub> levels were associated with higher von Willenbrand factor levels, lower ADAMTS13 activity and higher fibrinogen levels, indicating a higher likelihood of clotting. These associations occurred independent of traditional heart risk factors, such as high blood pressure and smoking. Additionally, the study showed that von Willenbrand factor and fibrinogen could explain up to 10% of the association between the higher free T<sub>4</sub> levels and heart events.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study is important as it highlights possible new mechanisms that explain thyroid hormone action on the heart. Physicians should be aware of the possible relationship between thyroid hormones and the coagulation system, even though it remains unclear how to use these findings in the real-world setting. In the future, these results may be useful in determining the overall risk profile for patients' risk of heart disease.

— Maria Papaleontiou, MD

### ATA THYROID BROCHURE LINKS

Thyroid Function Tests: <https://www.thyroid.org/thyroid-function-tests/>

### ABBREVIATIONS & DEFINITIONS

Clotting factors: proteins in the blood that control bleeding. Von Willenbrand factor, fibrinogen and ADAMTS13 activity are examples of clotting factors.

Thyroxine (T<sub>4</sub>): the major hormone produced by the thyroid gland. T<sub>4</sub> gets converted to the active hormone T<sub>3</sub> in various tissues in the body.

Coagulation system: composed of cells, proteins and processes that regulate blood clotting.

