

How thyroid function affects stress-related heart problems

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Johannes Dietrich and Assem Aweimer (right) have examined "broken heart syndrome" more closely. Credit: M. Kalwey / Bergmannsheil

Takotsubo cardiomyopathy—also known as stress cardiomyopathy or 'broken heart syndrome'—has only been known as a clinical condition for about 30 years. It is characterized by an acute, serious functional disorder of the heart muscle, usually triggered by an extreme emotional and psychological stress situation. If detected at an early stage and treated correctly, the prognosis is generally favorable for most patients. However, the acute phase of the disease can lead to complicated and even life-threatening progressions. Researchers have long suspected that there is a close correlation between the occurrence of Takotsubo cardiomyopathy and diseases of the thyroid gland. A research group from Bochum and Mannheim has now systematically tested patients with Takotsubo syndrome for their thyroid metabolism in a large number of cases and compared them with healthy people and patients who have had a heart attack.

Using [artificial intelligence](#) and systems biology models, a strong correlation was found between

thyroid function and Takotsubo syndrome in two subforms. One form, the so-called endocrine type, is an overactive thyroid gland that promotes the risk of a [heart](#) disease. The second form, the so-called stress type, is caused by an elevated target value of thyroid regulation, which is probably directly related to the stress event. Here, no direct effect of the thyroid hormones on the heart can be proven.

How hormones influence heart sensitivity

"It has not yet been understood why stress events have very different effects on the heart," explains Dr. Assem Aweimer, senior physician at the cardiology clinic in Bergmannsheil. "The results of our study provide a new explanatory model that traces increased sensitivity of the heart muscle to stress hormones back to sensitisation by thyroid hormones." Associate professor Dr. Johannes Dietrich, senior physician at the medical hospital I in Bergmannsheil, adds: "The results of the study highlight the importance of psychoendocrine connections even in severe diseases. In the future, thyroid function could serve as a biomarker for the individual mechanism of Takotsubo syndrome and help optimize personalized drug therapy."

More information: A. Aweimer et al. Abnormal thyroid function is common in takotsubo syndrome and depends on two distinct mechanisms: results of a multicentre observational study, *Journal of Internal Medicine* (2020). [DOI: 10.1111/joim.13189](https://doi.org/10.1111/joim.13189)

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