



INFLUENCE OF LOW TRIIODOTHYRONINE SYNDROME ON THE COURSE OF HEART FAILURE IN PATIENTS WITH A HISTORY OF MYOCARDIAL INFARCTION

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Background

Progression of heart failure (HF) leads to hormonal changes, including low triiodothyronine syndrome (LT₃S). The LT₃S that accompanies HF can lead to a number of disorders, including the reduction of systolic heart function, the development of arrhythmias, increased vasoconstriction.

Purpose

To study the influence of LT₃S on the course of HF in patients with a history of myocardial infarction (MI).

Methods

354 patients with HF and history of MI were included in the 2-year follow-up study. The levels of thyroid-stimulating hormone (TSH), free triiodothyronine (T_{3f}) and free tetraiodothyronine (T_{4f}), and reversible T₃ were determined by using ELISA-kits. The echocardiography was performed. The LT₃S was diagnosed if T_{3f} was less normal level and T_{4f}, TSH were normal. The relative risk (RR) of re-hospitalization and mortality was calculated with a 95% confidence interval (CI). All statistical tests were 2-tailed and $p < 0.05$ was considered statistically significant and performed in IBM® SPSS® Statistics, 20.0 and MedCalc, 18.9.1.

Results

The frequency of LT₃S (T_{3f} <2.5 pmol/l) among patients with HF is 22.3 %.

The risk of rehospitalization of patients according to ROC-analysis increases at the intersection of the point T_{3f} ≤2.07 pmol/l ($P = 0.0017$). At T_{3f} ≤2.07 pmol/l the frequency of LT₃S is 17.8 %.

Patients with LT₃S (T_{3f} ≤2.07 pmol/l) are younger (2.5 years younger; $P = 0.039$), have larger end-diastolic size (by 4.8 %; $p = 0.010$) and volume (by 10.2 %; $P = 0.012$), end-systolic size (by 8.8 %; $P = 0.003$) and volume (by 20.1 %; $P = 0.006$), lower left ventricle (LV) ejection fraction (by 9.5 %; $P = 0.033$), than the patients without LT₃S. The relative risk of rehospitalization in patients with LT₃S (T_{3f} ≤2.07 pmol/l) is 2.224 ($P < 0.05$).

Patients with HF with concomitant LT₃S are more likely to be re-hospitalized for decompensation of heart disease within 24 months of follow-up compared with patients with HF without LT₃S (78.4%, vs. 12.5%, respectively; $RR = 45.05$ (27.37-74.14); χ^2 (Log Rank (Mantel-Cox) = 224.283; $p < 0.0001$) (Fig. 1). The mean time of development in the group with LT₃S was 10.8 ± 0.8 months, against 22.6 ± 0.3 months. among patients without LT₃S.

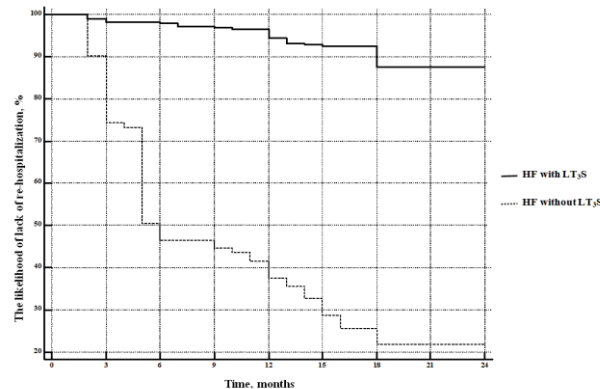


Figure1. The Kaplan-Meier survival curves of the probability of re-hospitalization in patients with HF, depending on the presence or absence of LT₃S.

Conclusions

The frequency of LT₃S (T_{3f} <2.5 pmol/l) among patients with HF is 22.3 % at level of T_{3f} ≤2.07 pmol/l – 17.8 %. The risk of rehospitalization in patients with HF increases at intersection of the point T_{3f} ≤2.07 pmol/l. Patients with LT₃S (T_{3f} ≤2.07 pmol/l) are younger, have larger LV dilatation and lower ejection fraction, higher frequency of coronary intervention and rehospitalization risk than the patients without LT₃S.

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