INPLASY

Changes of Cardiac Function: Cardiac Adaptation in Patients with Hypothyroidism Assessed by Cardiac Magnetic Resonance-A meta-analysis

INPLASY202440114

doi: 10.37766/inplasy2024.4.0114

Received: 28 April 2024

Published: 28 April 2024

Corresponding author:
Haipeng Wang

hpwang0729@gmail.com

Author Affiliation:
Department of Radiology, Shandong Provincial Hospital Affiliated to Shandong First Medical University, Ji'nan, China.

Yang, YC; Xue, C; Zhang, LZ; Wang, YW; Ouyang, MX; Li, J; Wang, HP; Wang, CY.

ADMINISTRATIVE INFORMATION

Support - This work was supported by the Shandong Provincial Natural Science Foundation of China Grants [ZR2020QH266], the National Natural Science Foundation of China [grant number 82303031] and Bethune Public Welfare Foundation [grant number Z04JKM2022E036].

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202440114

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 April 2024 and was last updated on 28 April 2024.

INTRODUCTION

Review question / Objective The meta-analysis aimed to explore the cardiac adaptation in hypothyroidism patients compared to healthy people by cardiac magnetic resonance. Study participants included patients with overt hypothyroidism and patients with subclinical hypothyroidism. Healthy people were included in the control group. To study the effect of hypothyroidism on cardiac function based on cardiac magnetic resonance data. In addition, this meta-analysis also explored the effects of hypothyroidism treatment on cardiac function.

Condition being studied For overt hypothyroidism, criteria needed to consist of at least 1 elevated thyrotropin and 1 lowered free thyroxine measurement. Subclinical hypothyroidism was defined as a thyrotropin level above the reference range in combination with a free thyroxine level within the reference range (according to center-specific reference ranges).

METHODS

Participant or population Patients with overt hypothyroidism and subclinical hypothyroidism.

Intervention Overt hypothyroidism or subclinical hypothyroidism.

Comparator Healthy people.

Study designs to be included RCT, Case-control study, single-arm study.

Eligibility criteria Inclusion criteria are that: (1) be written in English or Chinese, (2) report CMR data

of hypothyroidism patients, (3) clinical study. And exclusion criteria was poor methodological quality.

Information sources PubMed, Cochrane Library, Embase, CNKI, and Sinomed.

Main outcome(s) Compared with healthy people, the decline of cardiac function indexes in patients with hypothyroidism, such as LVEF, LV Volume, SV, CI, LV Mass.

Quality assessment / Risk of bias analysis The quality of RCT and Case-control studies was assessed using NOS scales. Other types of studies used JBI scores.

Strategy of data synthesis Review Manager 5.4.1 and Stata 18 were used to analyze the data. For primary outcomes, prediction intervals were used to account for the heterogeneity between studies. Statistical heterogeneity, which describes the variation in results between studies. Inconsistency was assessed using the I2 statistic, with values less than 25% indicating low inconsistency and greater than 50% indicating heterogeneity. If I250%, the random effects model was used for the pooled analysis. Publication bias were assessed in funnel plots and Egger test. A sensitivity analysis omitting studies at high risk of bias was planned.

Subgroup analysis Patients were divided into overt hypothyroidism and subclinical hypothyroidism for subgroup analysis. For overt hypothyroidism, criteria needed to consist of at least 1 elevated thyrotropin and 1 lowered free thyroxine measurement. Subclinical hypothyroidism was defined as a thyrotropin level above the reference range in combination with a free thyroxine level within the reference range (according to center-specific reference ranges).

Sensitivity analysis Sensitivity analyses were conducted using Stata18. The methodology was to reflect the sensitivity of the analysis by analysing the change in the effect size after deleting one of the studies.

Country(ies) involved China.

Keywords Hypothyroidism, Levothyroxine, Cardiac function, Cardiac magnetic resonance, meta-analysis.

Contributions of each author

Author 1 - Yucheng Yang.
Author 2 - Chen Xue.
Author 3 - Laozhui Zhang.
Author 4 - Yanwei Wang.
Author 5 - Meixiang Ouyang.
Author 6 - Ju Li.
Author 7 - Haipeng Wang.
Author 8 - Cuiyan Wang.