

Thyroid function test derangements and mortality in chronic kidney disease and end-stage renal disease patients: A systematic review and meta-analysis

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OBJECTIVES

Various studies have associated thyroid functional disorders with increased risk of death in individuals with chronic kidney disease (CKD) and end-stage renal disease (ESRD). We here evaluate the consistency of these associations by means of a systematic review and meta-analysis

METHODS

We searched PubMed, Web of Science, Science Citation index, Cochrane library, and EMBASE databases (inception through October 2015) to identify studies that described the association between thyroid hormones and mortality in patients with CKD or ESRD. Two independent reviewers identified studies, extracted data, and assessed the risk of bias. Data were summarized using the random effects model, and heterogeneity was explored using subgroup analyses. Results were pooled by a meta-analysis, and reported as hazard ratios (HRs) and 95% confidence intervals (CIs).

RESULTS

Thirteen studies involving 14,977 participants (4,497 deaths) were identified. Of those, seven studies provided data on cardiovascular mortality (2,983 participants with 350 cardiovascular deaths). Among thirteen studies, two studies provided data on more than one definition of exposure, one on triiodothyronine (T3) and thyroxine (T4) associated-risk and the other on T3 and thyrotropin (TSH). In total, ten studies provided data on T3 associated-risk, two on T4 and three on TSH. Overall, confidence in the available evidence was moderate. The pooled adjusted HRs for all-cause mortality associated to thyroid function test derangements were: 1.97 (95% CI 1.37–2.84) for low T3 levels; 2.40 (1.47–3.93) for low T4 levels; and 1.24 (1.14–1.34) for hypothyroidism (TSH > reference range). The pooled adjusted HRs for cardiovascular mortality were: 2.26 (1.38–3.69) for low T3 and 3.06 (1.29–7.24) for low T4 levels.

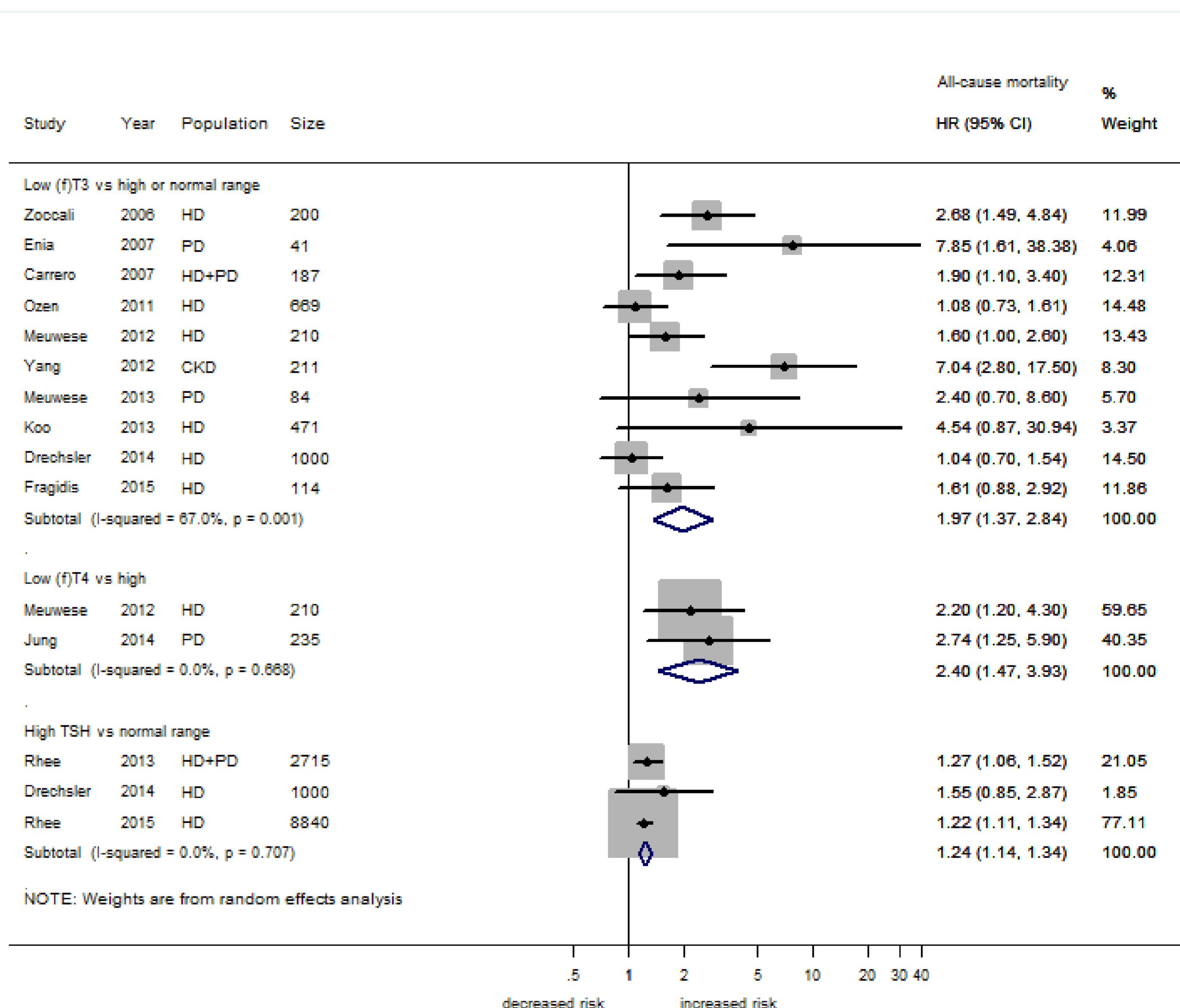


Figure 1. Forest plot depicting the meta-association between various forms of thyroid function test derangements and the risk of all-cause mortality, using the Dersimonian and Laird random effects model. All hazard ratios are based on the most fully-adjusted reported model.

CONCLUSIONS

Mortality is consistently higher in CKD or ESRD patients with thyroid function test derangements

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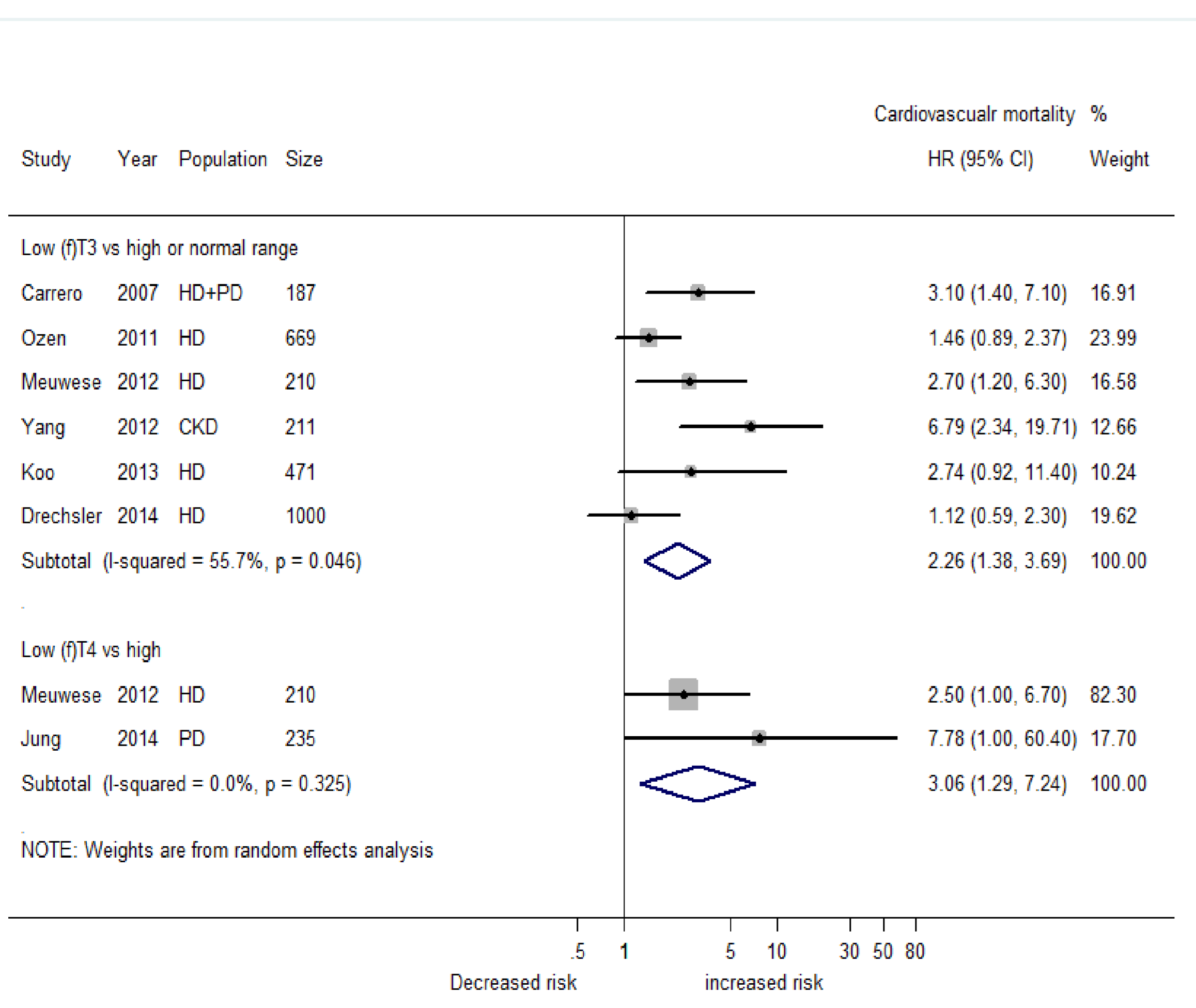


Figure 2. Forest plot depicting the meta-association between various forms of thyroid function test derangements and the risk of cardiovascular mortality, using the Dersimonian and Laird random effects model. All hazard ratios are based on the most fully-adjusted reported model.