

# SNORING IS A STRONG AMPLIFIER OF THE RISK BY HEART FAILURE FOR ALL CAUSE AND CARDIOVASCULAR MORTALITY IN CHRONIC KIDNEY DISEASE PATIENTS ON DIALYSIS (stage 5D-CKD)

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## INTRODUCTION

Self-reported snoring, an indicator of sleep disordered breathing (SDB), may associate with all-cause and cardiovascular (CV) mortality in the general population and in high risk conditions like heart failure (HF). SDB and HF are exceedingly frequent in the stage 5D-CKD population but the hypothesis that snoring may impact upon the relationship between HF and all-cause and CV mortality in these patients has never been tested.

The issue is important because SDB has been in part attributed to reversible pharyngeal edema secondary to volume expansion in HF patients<sup>1</sup> and may therefore be a modifiable risk factor.

## METHODS

We investigated this problem in a cohort of 827 stage 5D-CKD patients, all of Caucasian descent. HF was assessed at baseline on the basis of clinical symptoms, radiological and echocardiographic examinations.

At enrolment, participants provided self-reported information about snoring and were classified as non-snorers, moderate snorers and heavy snorers. Patients were followed up for a median time of 28 months (inter-quartile range: 21-35).

## RESULTS

One hundred and thirty-two patients (16%) were affected by HF at baseline. Overall, 194 patients (24%) were classified as heavy snorers, 308 (37%) as moderate snorers and 325 patients (39%) as non-snorers (Fig.1). During the follow-up period, 233 patients died, 127 of whom of CV causes. Both on univariate ( $P < 0.001$ ) and multivariate ( $P < 0.02$ ) Cox regression analyses, HF significantly predicted the study outcomes whereas snoring did not ( $P = NS$ ). However, snoring was a strong modifier of the risk of HF for all-cause and CV death. In fully adjusted Cox models (including age, gender, smoking, diabetes, systolic BP, anti-hypertensive treatment, CV comorbidities, dialysis vintage, CRP, phosphate, cholesterol, Hb and albumin), the hazard ratios (HR) associated to HF for the study outcomes (Fig. 2 A and B) were highest in heavy snorers [all-cause death: HR: 2.5 (95% CI: 1.5-4.2,  $P < 0.001$ ); CV death: HR: 3.1 (1.8-5.3),  $P < 0.001$ ], intermediate in moderate snorers [all-cause death: HR: 1.5 (1.1-2.1,  $P = 0.01$ ); CV death: HR: 1.6 (1.1-2.3,  $P = 0.009$ )] and lowest and not significant in non-snorers [all-cause death: HR: 0.9 (0.6-1.5); CV death: HR: 0.8 (CI: 0.5-1.5)].

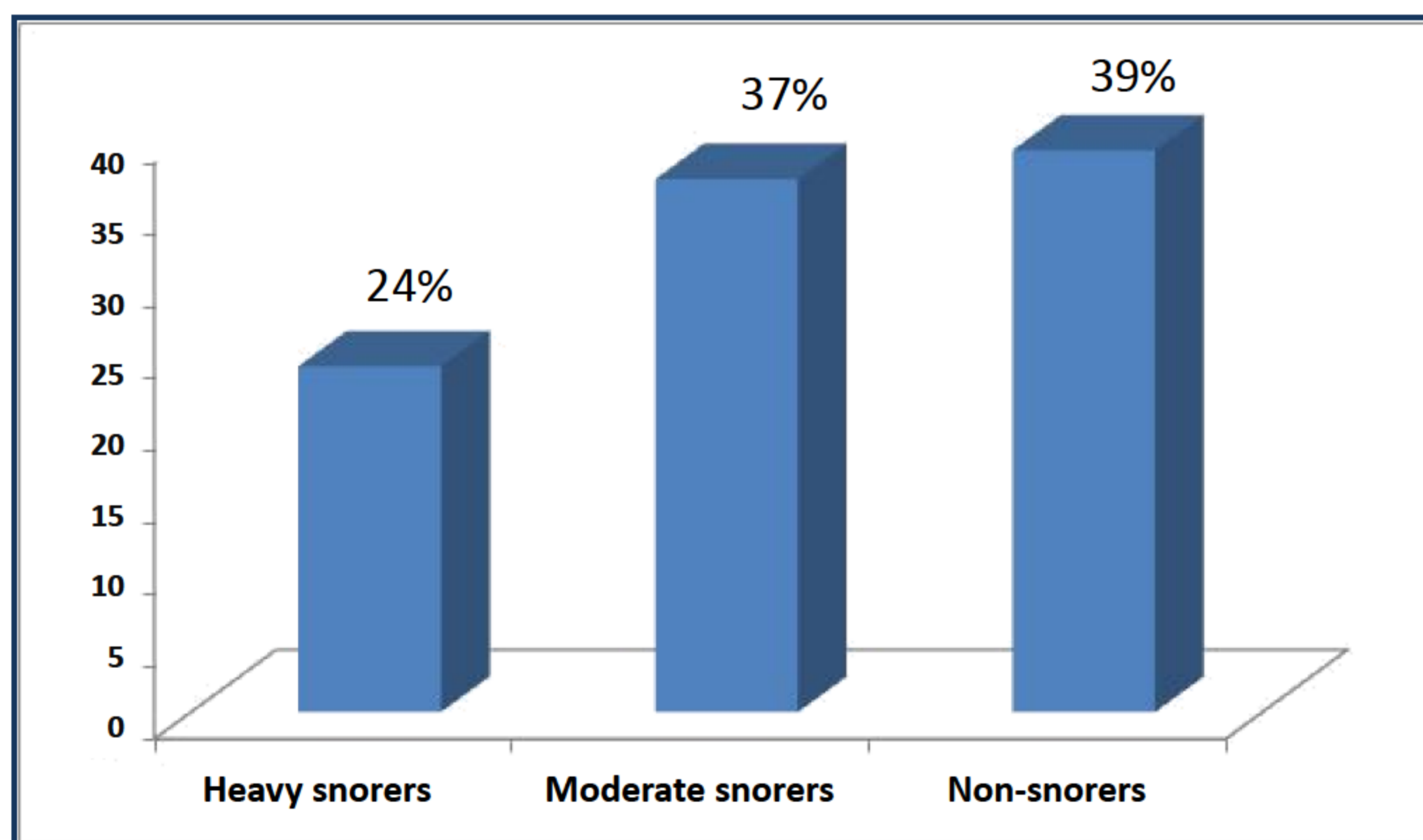


Fig. 1. Distribution of heavy snorers, moderate snorers and non-snorers in the study cohort.

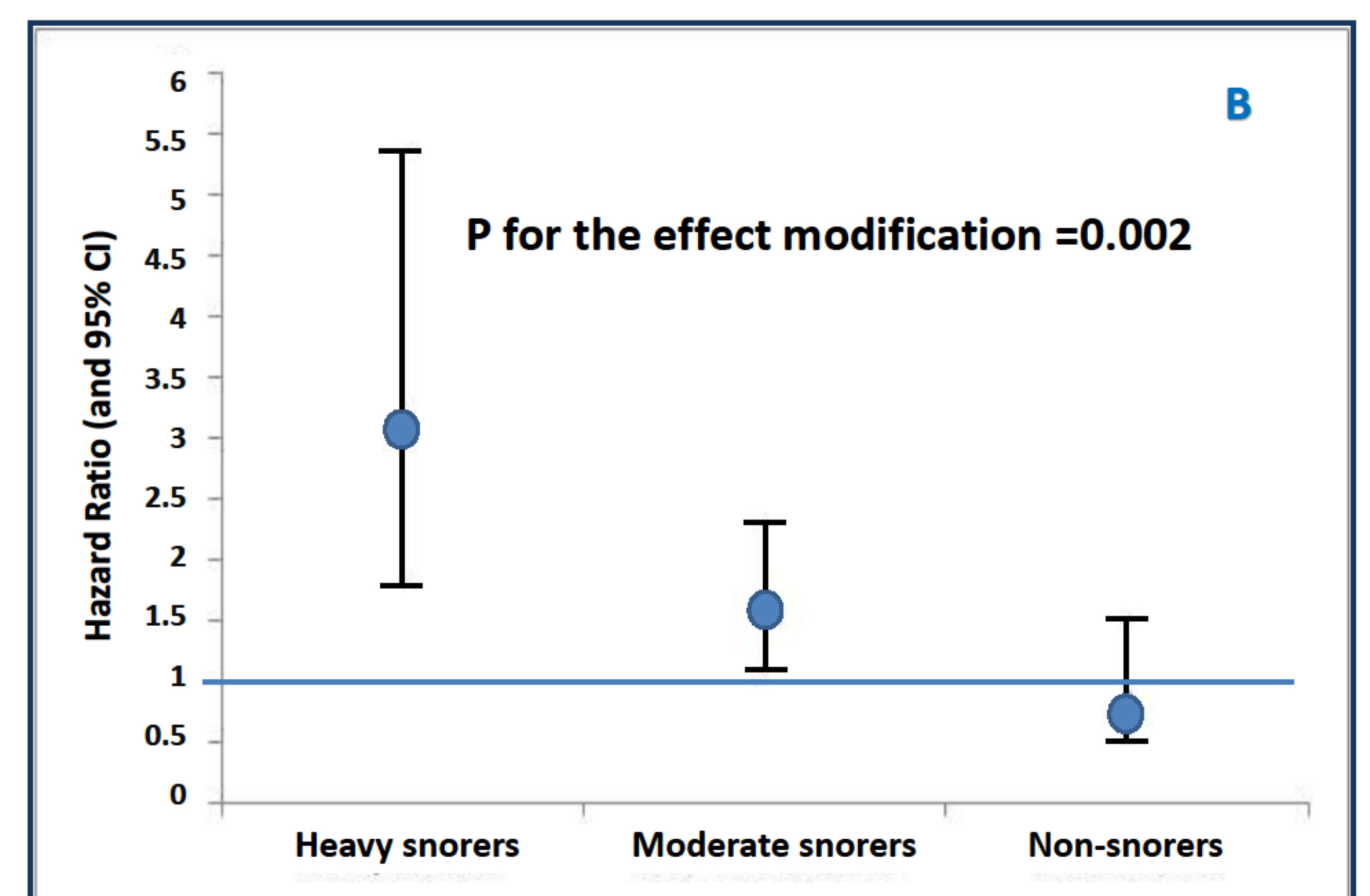
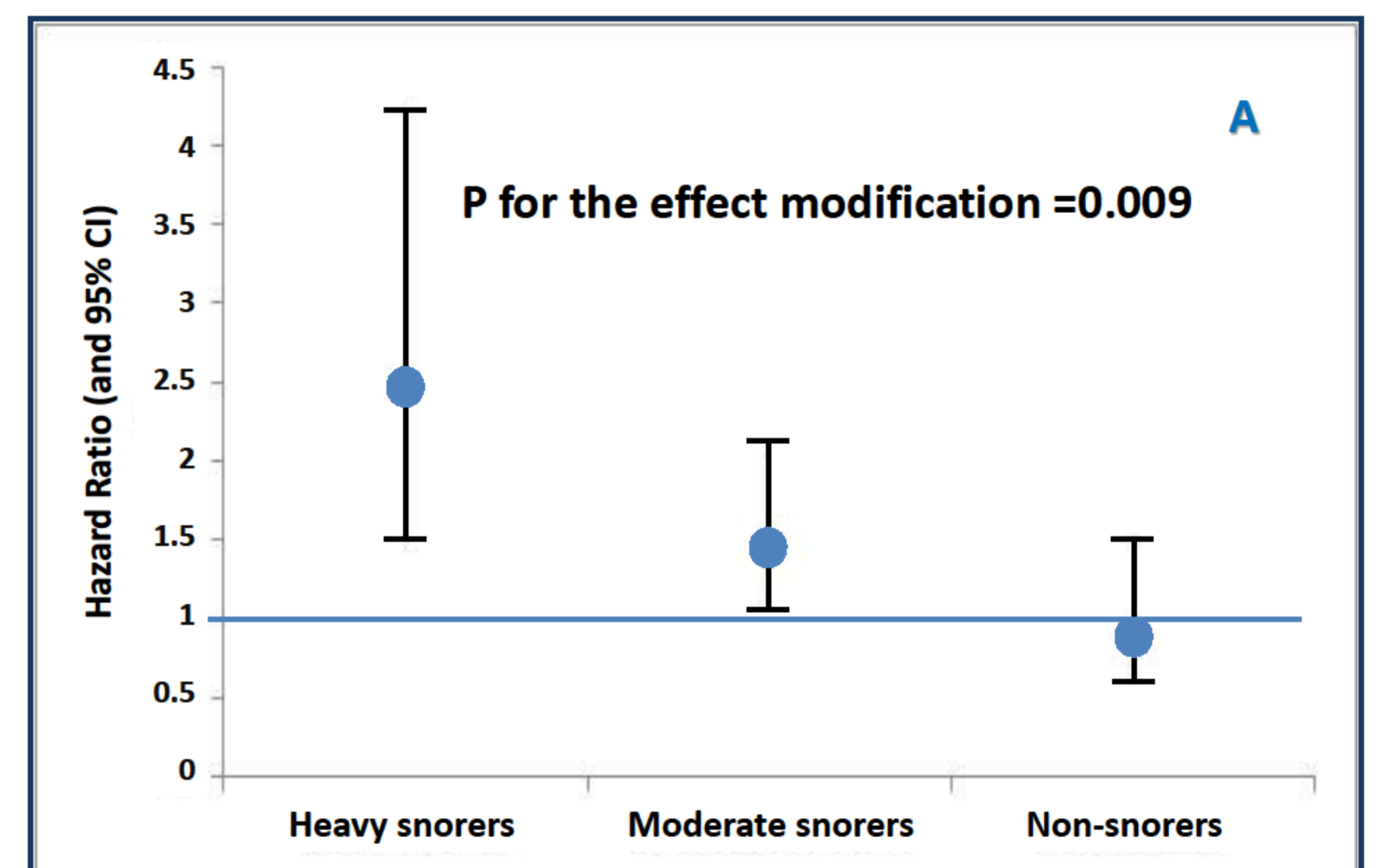


Fig. 2. Hazard ratio associated to heart failure (HF) for all cause mortality (A) or cardiovascular mortality (B) and 95% CI showing the effect modification of snoring on the considered outcomes.

## CONCLUSIONS

Snoring is an effect modifier of the relationship between HF and all-cause and CV mortality independently of traditional and non-traditional risk factors in stage 5D-CKD patients. Clinical trials are needed to verify whether intensified surveillance and treatment (UF intensification) of HF snorers on dialysis may translate into better clinical outcomes in this very high risk population.

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## REFERENCES

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