

# Deoxycholic Acid and the Risk of Death and Cardiovascular Events among Patients with Advanced Chronic Kidney Disease

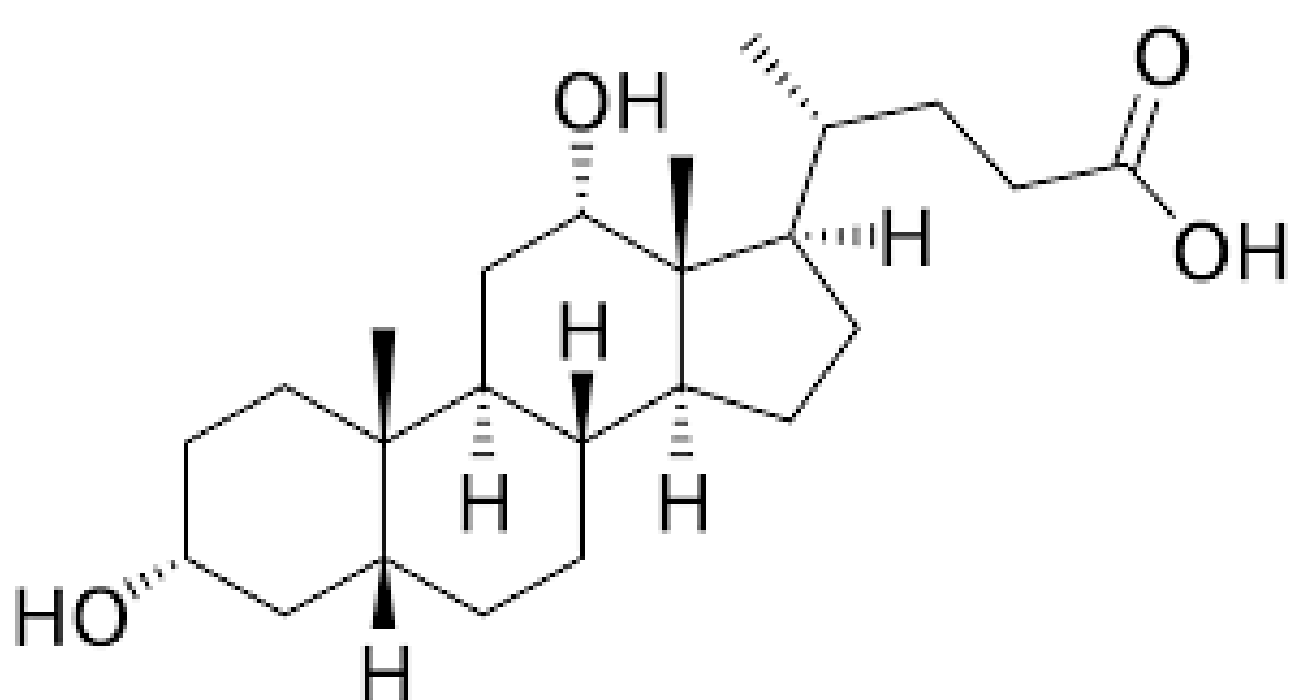
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## BACKGROUND

- Chronic kidney disease (CKD) affects 35.5 million people in the United States, representing more than 1 in 7 individuals.<sup>1</sup> Prevalence is even higher in the veteran population, affecting 1 in 6 US veterans.<sup>2</sup>
- Cardiovascular disease is the leading cause of death among individuals with CKD.<sup>3</sup>
- Bile acids are cholesterol-derived compounds that are elevated in CKD.<sup>4</sup> Specifically, the secondary bile acid deoxycholic acid (DCA) has demonstrated:
  - direct toxicity when applied to vascular smooth muscle cells<sup>5</sup>
  - independent association with coronary artery calcification as measured by coronary artery calcification scores in patients with moderate to severe CKD<sup>6</sup>
- However, the association between circulating DCA levels and death or cardiovascular events (CVE) in advanced CKD patients remains unclear.



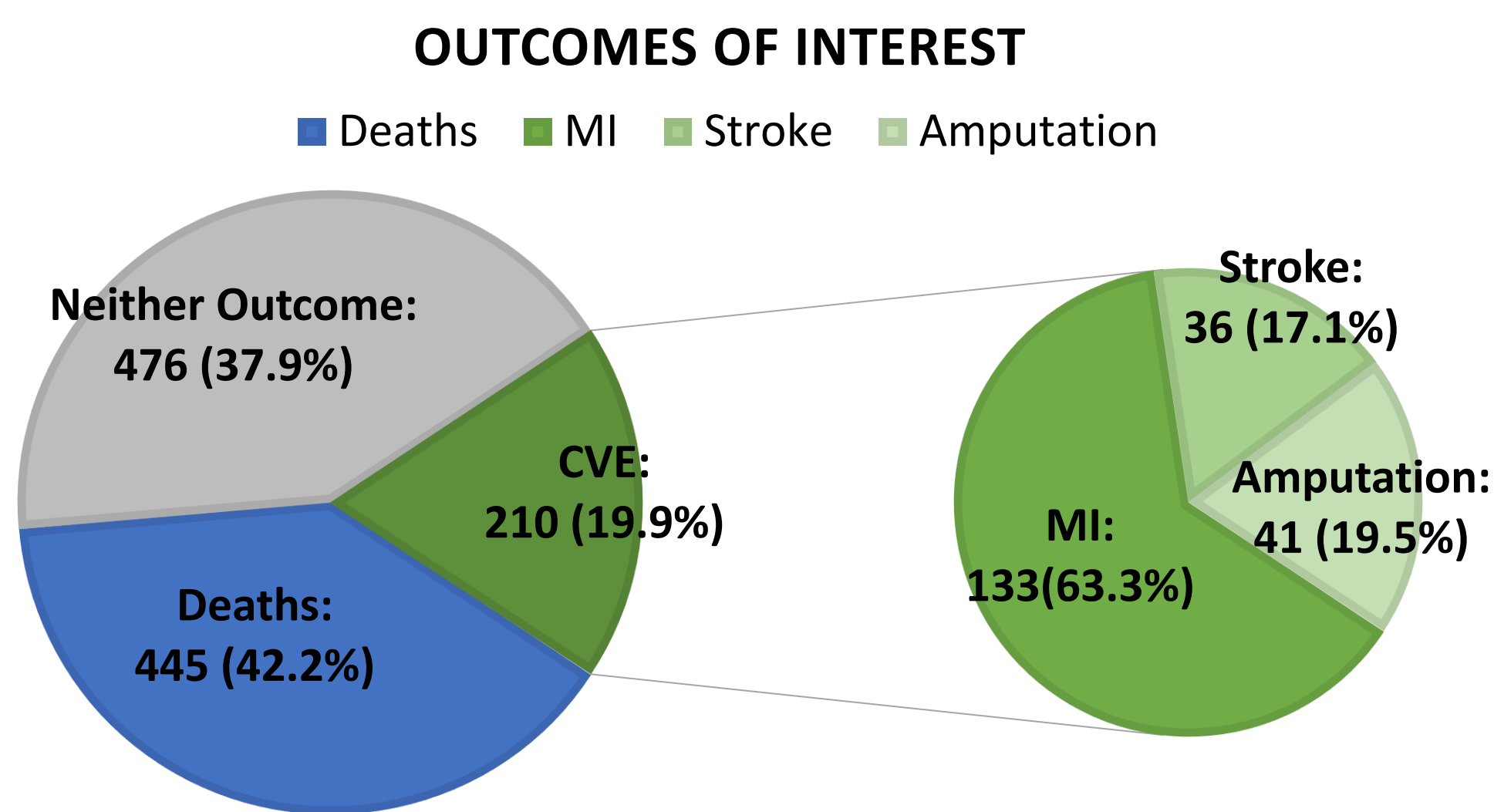
Deoxycholic Acid

## METHODS

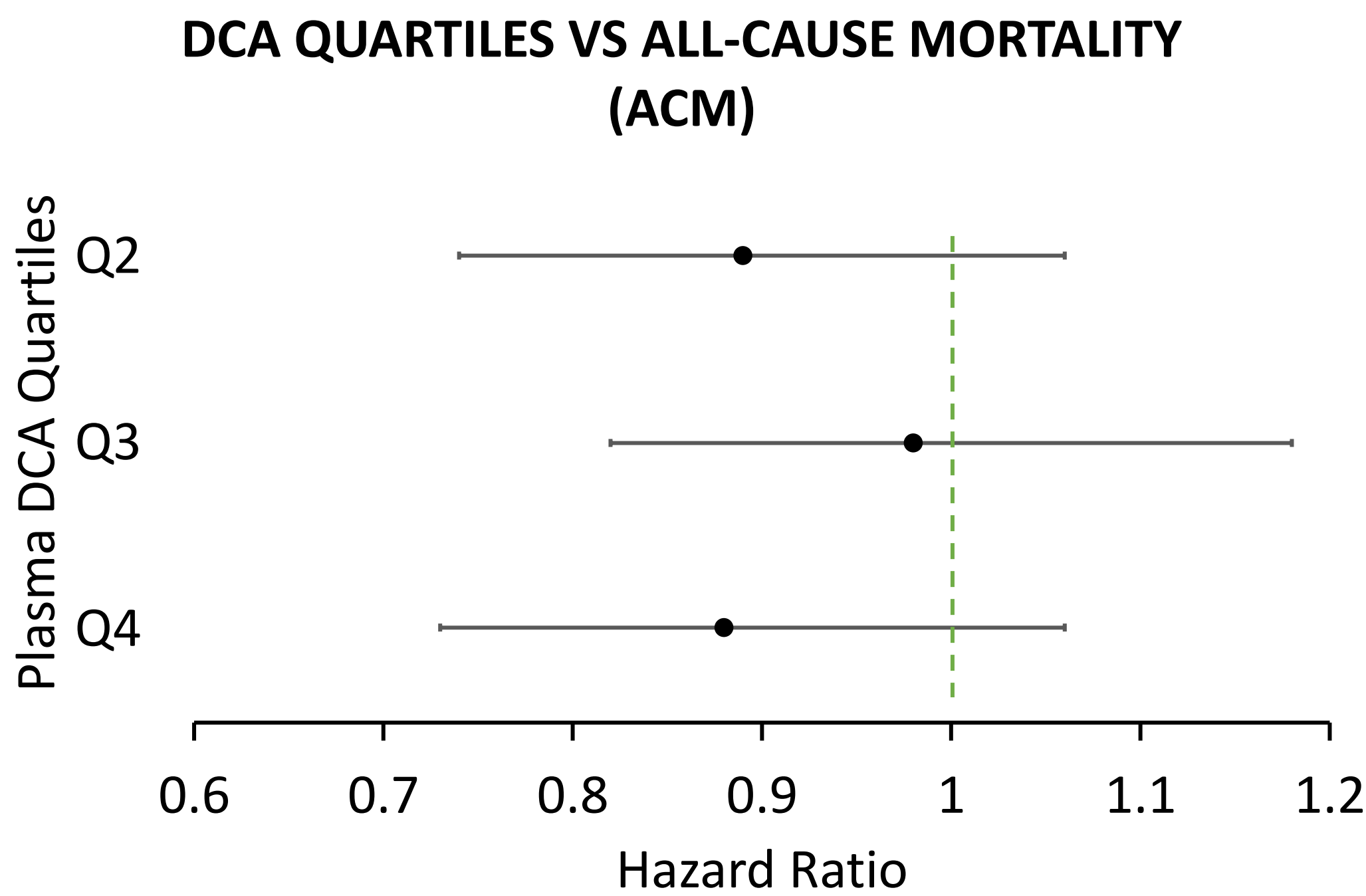
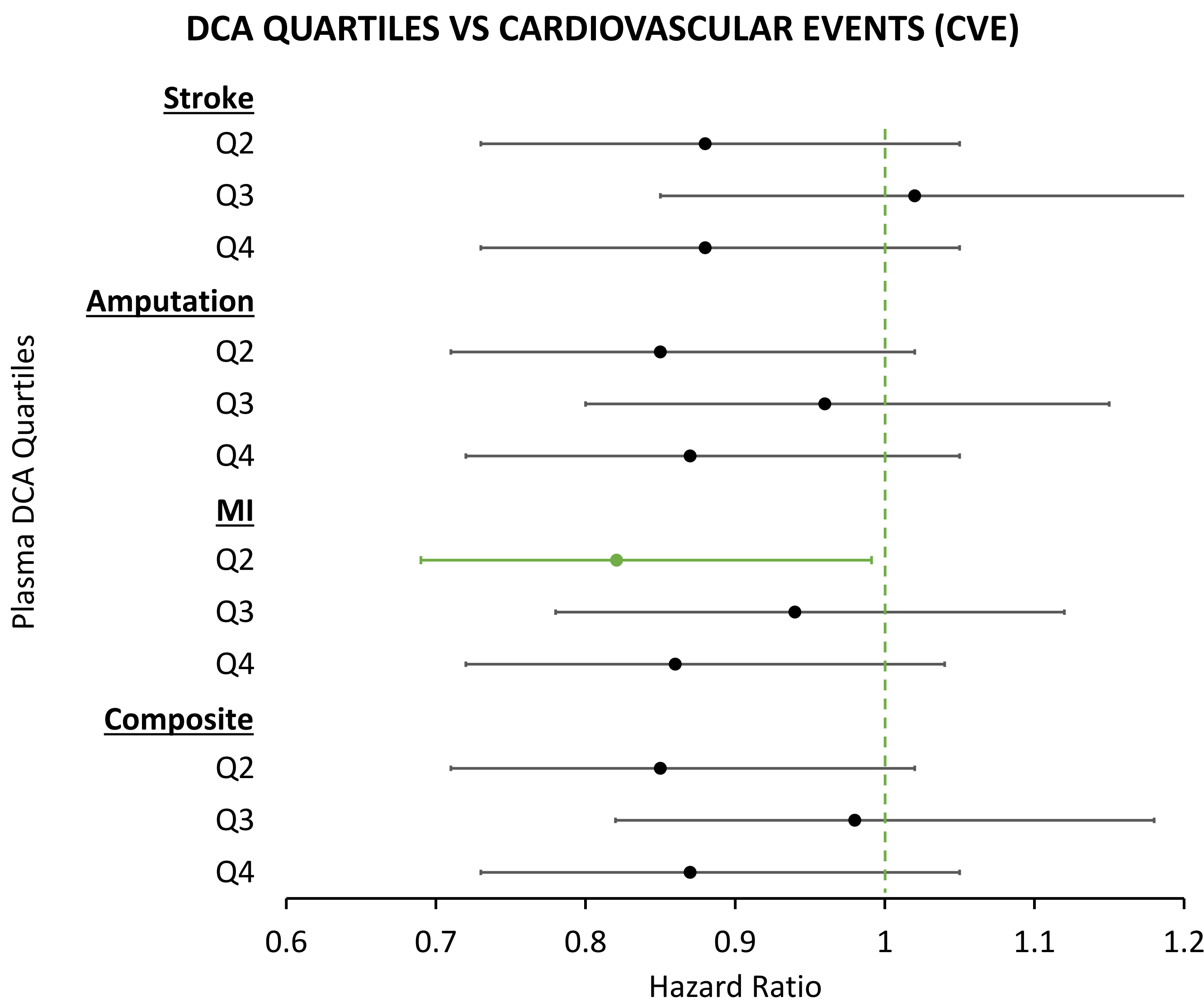
- The Homocysteine in Kidney and End-Stage Renal Disease (HOST) study was a randomized double-blind trial evaluating the effects of high doses of folic acid and B vitamins on all-cause mortality (ACM) and CVE in subjects with advanced CKD and elevated serum homocysteine levels
- Fasting serum DCA levels were measured in stored serum samples obtained at 3 months in 1,054 patients with mainly stage 4 CKD (mean eGFR 18.1± 6.5 mL/min/1.73m<sup>2</sup>).
- The study population was divided into quartiles according to plasma DCA levels.
- We used adjusted Cox proportional-hazards models to examine the association between DCA levels and ACM and a composite of CVE (combining myocardial infarction (MI), stroke and amputation).

## RESULTS

- Cohort of 1,054 patients
  - Average GFR: 18±6 ml/min
  - Mean age: 69±11 years
  - Median DCA level: 119 (63-232) ng/mL
  - Median follow-up: 2.9 years (2.1-3.7)



- Log<sub>2</sub>(DCA) vs Outcomes of Interest
  - Death: HR 0.97 (0.93 – 1.02)
  - Stroke: HR 0.98 (0.94 – 1.02)
  - Amputation: HR 0.97 (0.93 – 1.01)
  - MI: HR 0.97 (0.93 – 1.02)
  - Composite CVE: HR 0.975 (0.935 – 1.02)



## CONCLUSIONS

- Serum DCA levels were not associated with death and cardiovascular events among participants of HOST with advanced CKD.
- Adjusting for significant risk factors such as age, race, smoking history, diabetes, heart failure, and low BMI did not reveal significant changes in outcomes with varying bile acid levels.
- Despite short follow-up of three years, the study's large sample size and high incidence of death and cardiovascular events confer robust statistical power.
- Although DCA levels can fluctuate over time, fasting levels were obtained for this study
- An observational study with longer follow-up and larger population size should be considered to confirm these findings.

## REFERENCES

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