ALDH4A1 BLOOD LEVELS AND ATHEROSCLEROTIC DISEASE AMONG PATIENTS WITH ISCHEMIC STROKE

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Background and aims

- **Background:** The role of Aldehyde Dehydrogenase 4 Family Member A1 (ALDH4A1) in patients with atherosclerotic diseases remains unclear. Recent evidence suggests that ALDH4A1 may play a role in the pathogenesis of atherosclerosis.
- **Aim:** To explore the association of circulating ALDH4A1 with atherosclerotic disease outcomes in stroke patients.

Methods

- **Design:** Multicenter study using data from the prospective BIOSIGNAL cohort (ClinicalTrials.gov: NCT02274727).
- **Participants:** Patients with acute ischemic stroke between 2014 and 2017. ALDH4A1 plasma levels were measured in stored samples collected within 24 hours after stroke onset.
- **Primary outcome:** Large artery atherosclerotic stroke (LAAS) origin.
- **Secondary outcomes:** Maximum intima-media-thickness (IMT), degree of stenosis on ultrasound, and composite for atherosclerotic disease burden (large artery atherosclerotic index stroke, history of myocardial infarction, coronary artery disease, or peripheral artery disease).
- **Statistical Analysis:** Logistic regression analyses to examine the association between ALDH4A1 plasma levels (absolute and log-transformed) and the primary and secondary outcomes.

Results

- Of 1,759 stroke patients, 84.5% had available ALDH4A1 measurements.
- Circulating ALDH4A1 levels were neither significantly associated with LAAS (logALDH4A1 aOR 0.97, 95%CI 0.79-1.21, p=0.81) nor any secondary outcome measure including the maximum IMT, stenosis degree or the composite for atherosclerotic disease burden.
- Sensitivity analysis using inverse probability of treatment weighting were in line with the main findings.

Conclusion

- **Key Findings:** In acute stroke patients, no association was found between clinically relevant atherosclerotic disease outcomes and circulating ALDH4A1 levels. In addition, the maximum IMT was also not associated with elevated ALDH4H1 levels.
- **Clinical Implications:** First study in a vascular high-risk cohort to examine the association of circulating ALDH4A1 levels with manifest atherosclerosis outcomes. Our findings may inform future research by highlighting different subgroups and identifying potential limitations.

Figure 1: Study flow chart. ALDH4A1: Aldehyde Dehydrogenase 4 Family Member A1; BIOSIGNAL: Biomarker Signature of Stroke Aetiology study; MACE: major adverse cardiac event (including large artery atherosclerotic index stroke, history of myocardial infarction, coronary artery disease, or peripheral artery disease)

Figure 2: Distribution of (A) absolute and (B) log-transformed ALDH4A1 values according to age and sex. ALDH4A1: Aldehyde Dehydrogenase 4 Family Member A1