# HIGHER ASPARTATE AMINOTRANSFERASE LEVELS ARE ASSOCIATED WITH HIGHER ALL-CAUSE MORTALITY IN MAINTENANCE HEMODIALYSIS PATIENTS

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## BACKGROUND

In Maintenance Hemodialysis (MHD) patients, liver disease is a comorbidity and may be associated to poor survival. Some studies have observed positive association between elevated liver enzymes and mortality risk in MHD patients but to date, the relationship between Aspartate Aminotransferase (AST) and all-cause mortality risk in MHD patients has not been well studied. We hypothesized that higher levels of AST would be associated with increased all-cause mortality in MHD patients

## OBJECTIVE

To evaluate association between AST and all-cause mortality and to determine variables associated with higher AST level in a contemporary cohort of US dialysis patients.

## METHODS

In this study we analyzed a database of 114,267 DaVita MHD patients followed up to 8 years (2001-2009) to examine the association of AST with all-cause mortality. We used 5 categories of baseline AST (<20, 20-<40, 40-<60, 60-<80, ≥80 U/L) in Cox proportional hazard models with 3 levels of adjustment: unadjusted, case-mix, and case-mix covariates plus markers of the malnutrition and inflammation complex (MICS).

## RESULTS

Patients were 61±15 years old and included 45% women, 32% blacks, and 58% diabetics. Using AST <20 U/L as reference, there was a positive association between increasing AST levels and all-cause mortality across all levels of multivariable adjustment. In fully adjusted models, highest risk of death was observed in patients with AST levels ≥80 U/L (HR: 1.70, 95%CI: 1.56-1.85)

We used baseline AST levels in fractional polynomial models in fully adjusted models, We found a significant positive association between increasing AST levels above 20U/L and all-cause mortality.

**Table 1.** Demographic Characteristics of 114,267 MHD patients and in 5 AST groups

| | | AST (U/L) | | | | | |
|---|---|---|---|---|---|---|---|
| Variables | All | <20 | 20 to <40 | 40 to <60 | 60 to <80 | 80+ | P valueREG |
| No of patients | 114,267 | 74,949 | 34,301 | 3,367 | 896 | 754 | |
| Age (years) | 61±15 | 61±15 | 62±15 | 57±14 | 57±14 | 56±15 | <.0001 |
| Gender (% women) | 45 | 45 | 46 | 45 | 43 | 42 | 0.3653 |
| Race (Black%) | 32 | 32 | 32 | 42 | 42 | 43 | <.0001 |
| Tobacco Use(%) | 4 | 5 | 5 | 6 | 7.7 | 5.4 | 0.0047 |
| Drug Dependence(%) | 1 | 1 | 2 | 3 | 3.1 | 3.8 | <.0001 |
| Alcohol Dependence (%) | 1 | 1 | 2 | 3 | 3.8 | 4.2 | <.0001 |
| Diabetes mellitus (%) | 57 | 58 | 58 | 57 | 54 | 56 | 0.6564 |
| History of Hypertension(%) | 79 | 80 | 79 | 75 | 74 | 74 | <.0001 |
| AIDS(%) | 1 | 1 | 1 | 3 | 3.2 | 4 | <.0001 |
| Cancer(%) | 4 | 4 | 5 | 4 | 4 | 4 | 0.6805 |
| albumin (g/dL) | 3.67±0.46 | 3.72±0.44 | 3.6±0.49 | 3.42 ±0.55 | 3.3±0.58 | 3.29±0.57 | <.0001 |
| creatinine (mg/dL) | 8.02±3.32 | 8.38±3.32 | 7.34±3.22 | 7.48±3.37 | 7.37±320 | 7.45±3.28 | <.0001 |
| Body Mass Index (kg/m2 | 26.69±6.93 | 27.1±7.0 | 26.03±6.63 | 25.25±6.24 | 24.7±5.7 | 24.86±6.48 | <.0001 |

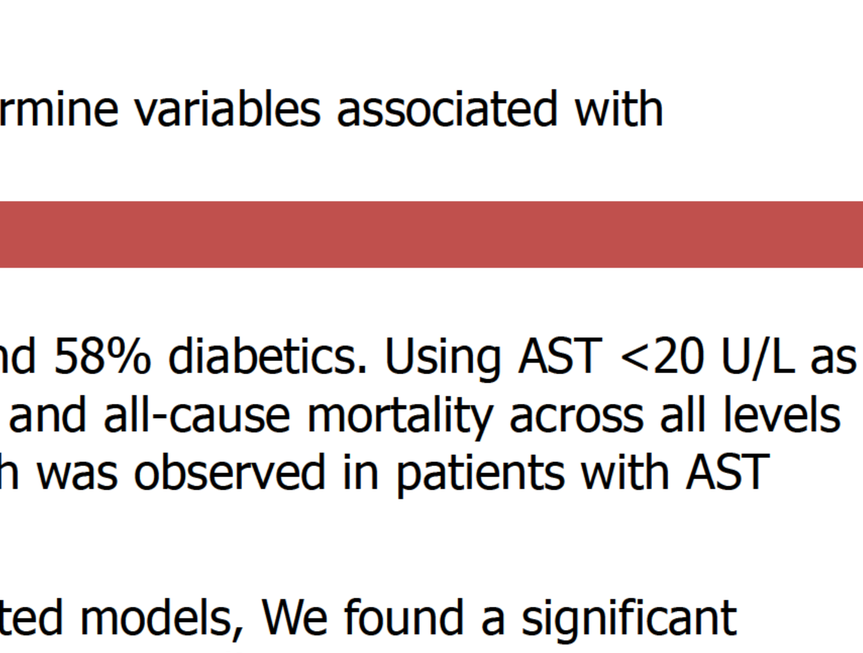


**Figure 1. All-cause mortality hazard ratio**
Unadjusted, Case-Mix adjusted, Case mix+MICS adjusted

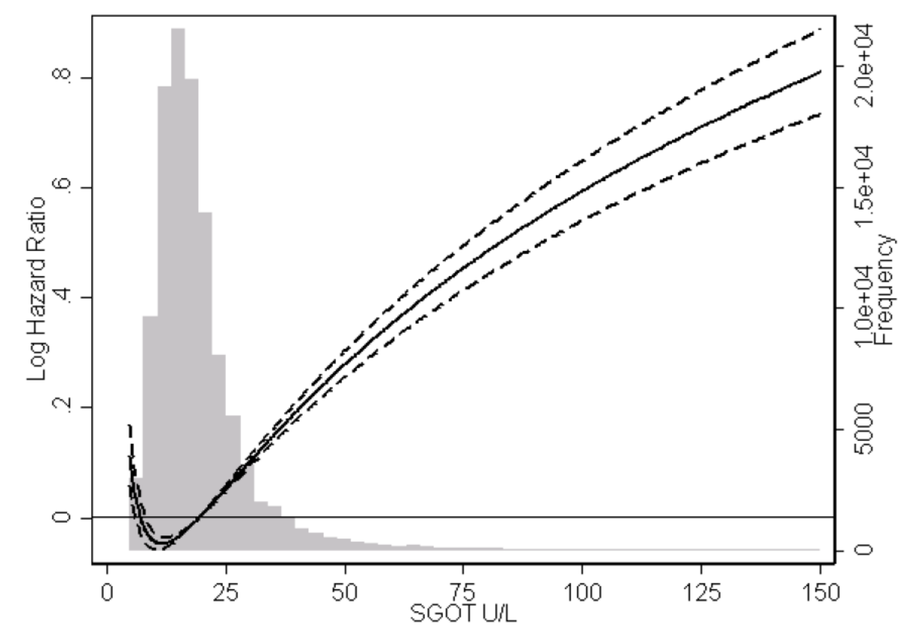


**Figure 2. Mortality spline**
Case mix+MICS adjusted

## CONCLUSION

In MHD patients, increasing levels of serum AST above 20 U/L are associated with a linear increased risk of all-cause mortality even after adjustment for MICS markers. Further studies are needed to confirm findings and determine mechanistic pathways of the AST–mortality association

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