

This is a Fresenius Medical Care summary of:

Effect of Hemodiafiltration (HDF) or Hemodialysis (HD) on Mortality in Kidney Failure

Blankestijn PJ, Vernooij RWM, Hockham C, Strippoli GFM, Canaud B, Hegbrant J, Barth C, Covic A, Cromm K, Cucui A, Davenport A, Rose M, Török M, Woodward M, Bots ML; CONVINCe Scientific Committee Investigators. N Engl J Med. 2023 Jun 16.

Study Design and Methods

Aim: To evaluate the comparative efficacy of high-dose HDF and high-flux HD on all-cause and cause-specific death, fatal and non-fatal cardiovascular events, all-cause and cause-specific hospitalizations

Patients: 1360 adults; 61 dialysis centers; eight European countries

Design: Pragmatic, open-label, 1:1 randomized controlled trial; patients assigned to online high-volume HDF (n=683) or HF-HD (n=677)

Definitions: High-dose HDF = high-dose post-dilution HDF with on-line production of fluids, convection volume (CV) ≥ 23 L per session

Methods: CV targets achieved with stepwise adjustment over 2–3 weeks; interventions and outcomes assessed over 30 months (median)

Primary outcome: All-cause mortality (median follow up: 30 months)

Secondary outcomes: Sub-group analyses for cardiovascular-, non-cardiovascular-, infection-related- causes of death; fatal or non-fatal cardiovascular outcome; kidney transplantation; hospitalizations

Results

Primary outcome:

The HDF group had a lower rate of death (HR = 0.77, 95% CI: 0.65–0.93, $p < 0.05$) vs. the HD group, equating to a 23% lower rate of mortality in the HDF vs. HD group

Secondary outcomes:

- No significant differences between groups for cardiovascular- or non-COVID-19 infection-related deaths
- Hospitalizations for non-fatal causes were higher with HDF but not significant
- Subgroup analyses showed no survival benefit for patients with history of diabetes or CVD at baseline. There was a benefit for patients without diabetes or without CVD
- Higher Kt/V (1.74 vs. 1.65) compared to HD patients during study and follow up
- HDF patients had higher blood flow (374 vs. 369 mL/min)

Strengths and Limitations

Strengths:

- Large, randomized, pragmatic trial
- Sample size large enough for 80% power
- Statistical methods were appropriate
- Complete follow-up on mortality
- Primary outcome achieved

Limitations:

- Lower sample size achieved due to Covid-19
- Overall lower risk of death than expected
- Potential selection bias for patients with good vascular access
- Patients were expected to complete outcome assessments
- Subanalyses should be interpreted with some caution

Conclusions: The CONVINCe trial differs from previous studies in that it enrolled patients who were likely candidates for high-dose hemodiafiltration nearly all the time. Hemodiafiltration is a general and nonselective intervention that potentially involves multiple mechanisms, including increased removal of uremic toxins and other physiologic processes. At a median follow-up of 30 months after randomization, patients with kidney failure who received high-dose hemodiafiltration had a lower risk of death (23%) than those who received high-flux hemodialysis. Analyses of both infection-related and cardiovascular deaths showed positive trending in favor of OL-HDF but lacked significance. This investigator-initiated project received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement No 754803.



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