

# Haemodiafiltration and mortality in end stage kidney disease patients: an individual participant data meta-analysis



UMC Utrecht

## The HDF Pooling Project

Sanne Peters, Michiel Bots, Bernard Canaud, Andrew Davenport, Muriel Grooteman, Fatih Kircelli, Francesco Locatelli, Francisco Maduell, Marion Morena, Menso Nubé, Ercan Ok, Ferran Torres, Mark Woodward, Peter J. Blankestijn

### RCTs evaluating HDF vs HD

CONTRAST 715 patient, JASN 2012  
 Turkish trial, 782 patients, NDT 2013  
 ESHOL, 906 patients, JASN 2013  
 French, 420 patients, unpublished

### Aim of this study:

compare effects of online HDF and standard HD on all cause and cause specific mortality in ESKD patients

**Pooling all individual data** of three published trials and adding the one unpublished trial

For this analysis additional follow up data on all cause and cause specific mortality was collected.

2793 patients, median follow up 2.5 y

### SUMMARY

#### Online hemodiafiltration in post-dilution mode:

Individual participant data meta-analysis shows:

1. Reduction in all cause mortality (Table 1)
2. Especially when convection volume > 23 L/session (i.e. 69 L/week) (Table 2)
3. No clear side effects
4. Mechanism(s): unable to confirm original hypothesis
5. Great variability in achieved volume (Figure)

### Limitations

Individual trials do not have:

- a. sufficient power for sub-group analysis
- b. ability to adequately adjust for potential confounders

Methodological flaw: selection bias because of censoring due to non-fatal events in two of the trials (no intention to treat analysis). Complete data in other two trials

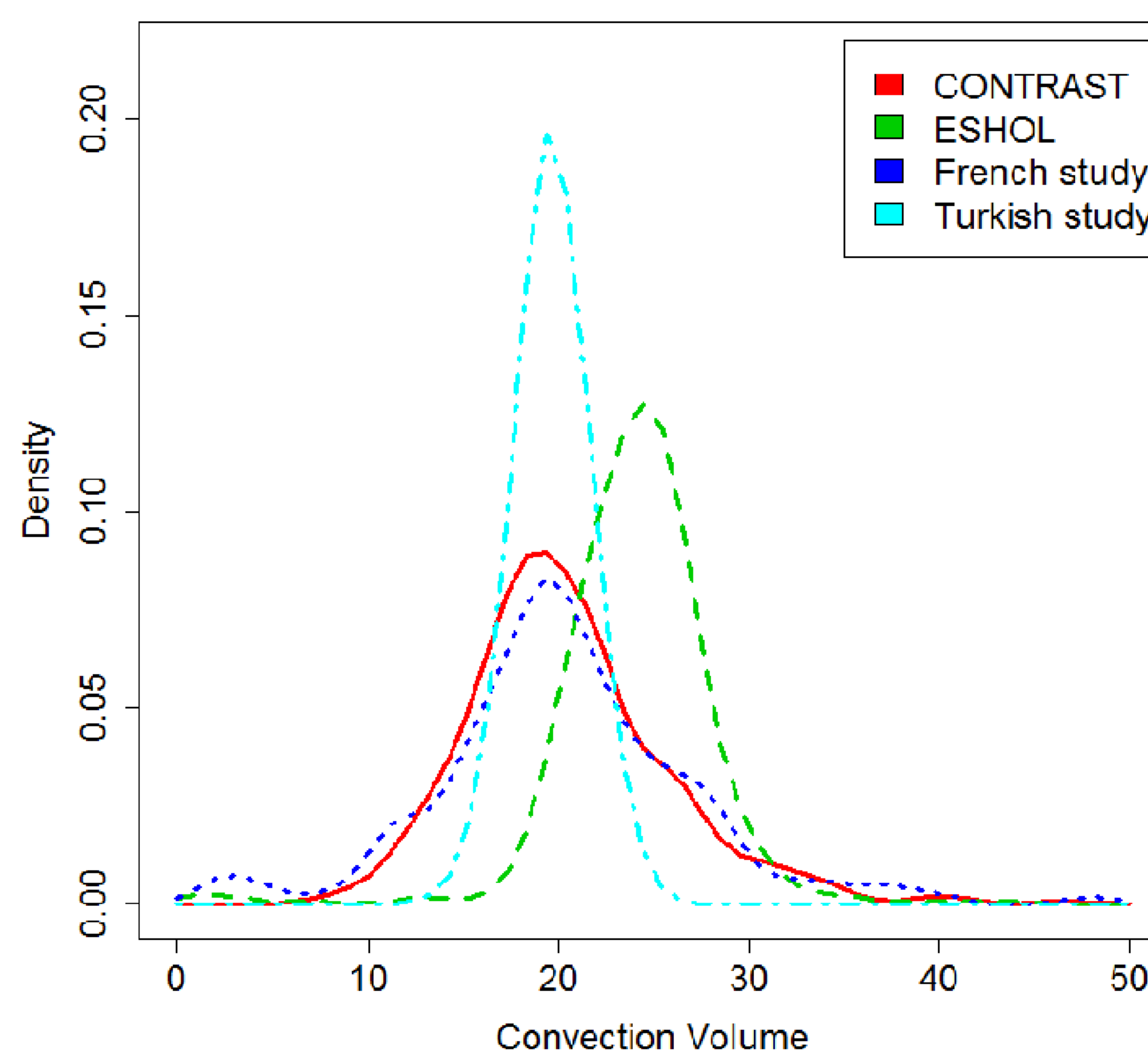


Figure. Distribution of achieved convection volume by study

### CONCLUSION

#### Online hemodiafiltration in post-dilution mode:

- Suggestion of superiority in the same logistical and organizational infrastructure in combination with an apparent lack of side effects, supports the idea of wide spread acceptance
- Time for paradigm shift: dose treatment based on convection volume
- European “end of discussion” trial should study the effects of consistently delivered high dose HDF as compared to standard HD

Table 1. Meta-analysis of all individual data of the 4 RCTs

	Hemodialysis		On line HDF		HR (95% CI)
	Events	Events/100 PY	Events	Events/100 PY	
All-cause mortality	410	12.10	359	10.45	0.86 (0.75; 0.99)
CVD mortality	164	4.84	128	3.73	0.77 (0.61; 0.97)
Infections	77	2.27	73	2.13	0.94 (0.68; 1.30)
Sudden death	56	1.65	56	1.63	0.99 (0.68; 1.43)

Table 2. Risk of mortality by achieved convection volumes (tertiles)

	Hemodialysis	Online Hemodiafiltration Convection Volume		
		<19	19–23	>23
<b>All-cause mortality</b>				
Crude	1	0.90 (0.71; 1.13)	0.99 (0.81; 1.20)	0.65 (0.52; 0.82)
Adjusted	1	0.82 (0.64; 1.04)	1.09 (0.89; 1.33)	0.64 (0.51; 0.81)
<b>CVD mortality</b>				
Crude	1	0.98 (0.68; 1.40)	0.81 (0.59; 1.11)	0.61 (0.43; 0.88)
Adjusted	1	0.96 (0.66; 1.39)	0.83 (0.59; 1.16)	0.57 (0.38; 0.84)
<b>Infections</b>				
Crude	1	1.50 (0.91; 2.48)	0.89 (0.52; 1.51)	0.69 (0.38; 1.25)
Adjusted	1	1.57 (0.92; 2.67)	0.92 (0.52; 1.63)	0.71 (0.39; 1.30)
<b>Sudden Death</b>				
Crude	1	1.24 (0.78; 1.97)	1.09 (0.72; 1.67)	0.50 (0.28; 0.88)
Adjusted	1	1.10 (0.67; 1.82)	1.30 (0.83; 2.03)	0.53 (0.30; 0.96)

