83928

Systolic blood pressure variability and effect of finerenone treatment in patients with chronic kidney disease and type 2 diabetes: a FIDELITY analysis

Sanjay Rajagopalan, MD; Peter Rossing, MD; Bertram Pitt, MD; Stefan D. Anker, MD, PhD; Gerasimos Filippatos, MD; Zihe Zheng, PhD; Charlie Scott, MSc; Sadeer Al-Kindi, MD; on behalf of the FIDELIO-DKD and FIGARO-DKD investigators

29 Aug 2026

This analysis as well as the FIDELIO-DKD and FIGARO-DKD trials were funded by Bayer AG

High visit-to-visit SBP variability is associated with increased risk of CV events and CKD[1–8]

- Increased long-term SBP variability was associated with **all-cause mortality** and **CV events** in a meta-analysis of 36 cohorts[9]
- Patients with higher visit-to-visit SBP variability had a **2.1-fold increase** (95% CI 1.7–2.4) in **CV events***[,10]
- Longitudinal changes in SBP variability were associated with **CVD**, **CKD**, and **all-cause mortality** (28–46% increased risk)[2]
- Prognostic value of SBP variability as a risk factor is comparable with **mean SBP** and **cholesterol**[9,11]
- Medications impact SBP variability:
  - **CCBs** and **thiazide diuretics reduce SBP variability**[#,6,8]
  - **ACE inhibitors**, **ARBs**, and **β-blockers increase SBP variability**[#,8]
- **Increased aldosterone and MR activation contribute to high SBP variability**[12–14]
  - **Steroidal MRAs have been shown to reduce BP** in individuals with elevated aldosterone[15,16]

This post hoc analysis of the FIDELITY dataset evaluated the association between **SBP variability and CV and kidney outcomes** and **the efficacy and safety of the nonsteroidal MRA finerenone vs placebo across strata of pre- and post-treatment SBP variability**

Study design and key outcomes

Background:

Finerenone, a selective nonsteroidal MRA, **reduced the risk of adverse CV and kidney outcomes vs placebo in FIDELITY**, a prespecified pooled analysis of the phase III FIDELIO-DKD and FIGARO-DKD trials[1]

Study design

Key inclusion criteria:

- Aged ≥18 years with T2D
- Maximum tolerated dose of ACEi or ARB for ≥4 weeks
- Moderately/severely increased albuminuria
- Serum [K^+] ≤4.8 mmol/L*

Key exclusion criteria:

- HFrEF with NYHA Class II–IV#
- Uncontrolled arterial hypertension
- SBP <90 mmHg
- HbA1c >12%‡
- Other kidney disease§

SBP variability was measured at:

- **Pre-treatment:** SBP at pre-screening, screening, and baseline
- **Post-treatment**: SBP every 4 months up to 1 year from baseline¶

Measures of SBP variability included:

- Standard deviation (SD)
- Coefficient of variation (CoV)
- Variation independent of the mean (VIM)

Composite efficacy outcomes and safety data by SBP variability quartiles

- Time to CV death, non-fatal MI, non-fatal stroke, or hospitalisation for heart failure
- Time to kidney failure, sustained ≥57% decrease in eGFR from baseline over at least 4 weeks, or kidney-related death
- TEAEs and hyperkalaemia

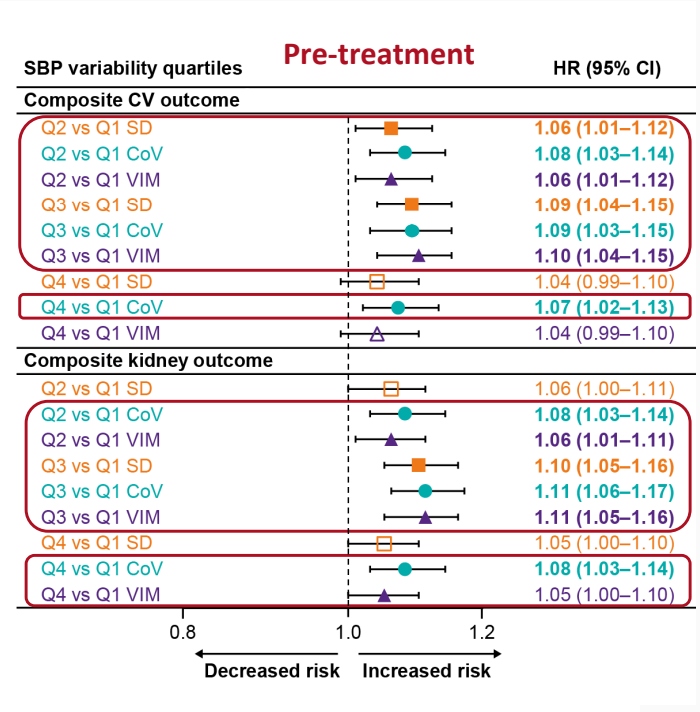
*At run-in or screening visit; #run-in only; ‡at run-in or screening visit; §known non-significant non-diabetic kidney disease; ¶For the post-treatment analysis, SBP readings at baseline and month 1 were excluded due to dose titration effects on BP variability and potential changes to BP medication. Participants without at least three SBP readings post baseline up to 1 year were excluded from this analysis

ACEi, angiotensin-converting enzyme inhibitor; ARB, angiotensin II receptor blocker; BP, blood pressure; CV, cardiovascular; eGFR, estimated glomerular filtration rate; HbA1c, glycated haemoglobin; HFrEF, heart failure with reduced ejection fraction; K, potassium; MI, myocardial infarction; MRA, mineralocorticoid receptor agonist; NYHA, New York Heart Association; od, once daily; Q, quartile; R, randomised; SBP, systolic blood pressure; T2D, type 2 diabetes; TEAE, treatment-emergent adverse event; UACR, urinary albumin-to-creatinine ratio

1. Agarwal R, *et al. Eur Heart J*. 2022;43:474–484

Higher pre-treatment SBP variability increased the risk of composite CV and kidney outcomes

Effect of pre- and post-treatment SBP variability on the risk of CV and kidney outcomes



Higher pre-treatment SBP variability increased the likelihood of composite CV and kidney events in both treatment groups

Higher post-treatment SBP variability did not significantly increase the risks across outcomes

Filled markers denote statistically significant associations

CI, confidence interval; CoV, coefficient of variation; CV, cardiovascular; HR, hazard ratio; Q, quartile; SBP, systolic blood pressure; SD, standard deviation; VIM, variation independent of the mean

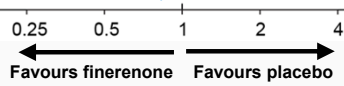
Pre-treatment SBP variability: The treatment effect of finerenone was consistent and unmodified across SBP variability quartiles

Composite CV outcome

	Finerenone		Placebo		Hazard ratio (95% CI)	*P*-interaction
	n/N	n/100 PY	n/N	n/100 PY		
Overall	823/6498	4.34	938/6492	5.02	0.86 (0.78–0.95)	
Quartiles of SBP SD						
Q1	193/1614	4.12	221/1645	4.71	0.88 (0.72–1.07)	0.1741
Q2	217/1568	4.75	235/1669	4.87	1.00 (0.83–1.20)	
Q3	210/1656	4.30	222/1593	4.78	0.91 (0.75–1.10)	
Q4	203/1660	4.23	260/1585	5.75	0.72 (0.60–0.87)	

Composite kidney outcome

	Finerenone		Placebo		Hazard ratio (95% CI)	*P*-interaction
	n/N	n/100 PY	n/N	n/100 PY		
Overall	356/6498	1.95	465/6492	2.56	0.76 (0.66–0.88)	
Quartiles of SBP SD						
Q1	83/1614	1.84	100/1645	2.21	0.85 (0.63–1.14)	0.5267
Q2	83/1568	1.90	134/1669	2.87	0.68 (0.52–0.90)	
Q3	79/1656	1.66	112/1593	2.48	0.67 (0.50–0.90)	
Q4	111/1660	2.41	119/1585	2.69	0.83 (0.64–1.08)	



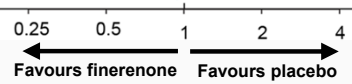
In patients with **high pre-treatment SBP variability**, a trend was observed **in favour of finerenone** for a **reduced risk of composite CV outcomes versus placebo**

CI, confidence interval; CV, cardiovascular; PY, patient-years; Q, quartile; SBP, systolic blood pressure; SD, standard deviation

Post-treatment SBP variability: The treatment effect of finerenone was consistent and unmodified across SBP variability quartiles

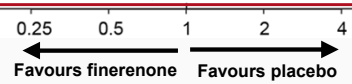
Composite CV outcome

	Finerenone		Placebo		Hazard ratio (95% CI)	*P*-interaction
	n/N	n/100 PY	n/N	n/100 PY		
Overall	495/5728	2.83	545/5691	3.14	0.90 (0.79–1.01)	
Quartiles of SBP SD						
Q1	113/1437	2.52	127/1418	2.92	0.81 (0.63–1.05)	0.6320
Q2	109/1399	2.53	140/1456	3.13	0.80 (0.62–1.04)	
Q3	128/1441	2.91	127/1414	2.94	1.00 (0.78–1.28)	
Q4	145/1451	3.35	151/1403	3.60	0.94 (0.74–1.18)	



Composite kidney outcome

	Finerenone		Placebo		Hazard ratio (95% CI)	*P*-interaction
	n/N	n/100 PY	n/N	n/100 PY		
Overall	254/5728	1.49	335/5691	1.97	0.75 (0.64–0.88)	
Quartiles of SBP SD						
Q1	55/1437	1.26	56/1418	1.32	0.95 (0.65–1.39)	0.5006
Q2	49/1399	1.16	78/1456	1.77	0.62 (0.43–0.91)	
Q3	64/1441	1.49	85/1414	2.00	0.74 (0.53–1.03)	
Q4	86/1451	2.05	116/1403	2.83	0.74 (0.56–0.99)	



In patients with higher **post-treatment SBP variability**, a trend was **observed in favour of finerenone** for a **reduced risk of composite kidney outcomes versus placebo**

Finerenone does not increase SBP variability compared with placebo

β-coefficients	*P*-value
Change in SBP variability SD	
–0.1458 (–0.3613 to 0.0697)	0.1848
Change in SBP variability CoV	
0.0589 (–0.0981 to 0.2159)	0.4624
Change in SBP variability VIM	
0.1290 (–0.0819 to 0.3398)	0.2305

SBP variability analysis was landmarked at 1 year post baseline, excluding events that happened during the time post-treatment SBP variability was defined and calculated. SBP readings at baseline and month 1 were excluded due to dose titration effects on BP variability and potential changes to BP medication. Participants without at least three SBP readings post baseline up to 1 year were excluded from this analysis.

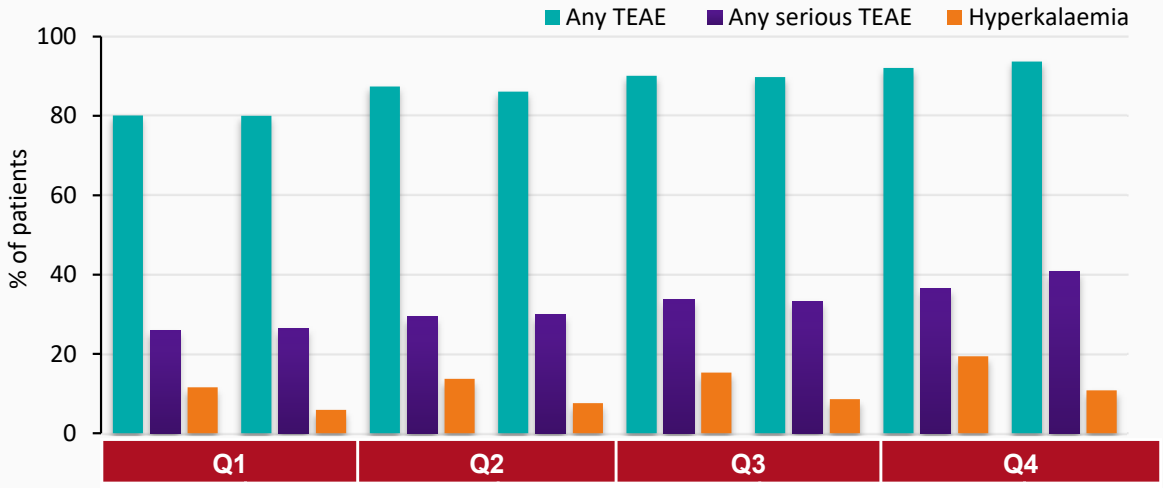
BP, blood pressure; CI, confidence interval; CoV, coefficient of variation; CV, cardiovascular; PY, patient-years; Q, quartile; SBP, systolic blood pressure; SD, standard deviation; VIM, variation independent of the mean

Rates of TEAEs and hyperkalaemia were not significantly different across SBP variability quartiles

Rates of TEAEs and serious TEAEs were **similar between treatment arms** and **across SBP variability quartiles** but increased in both treatment arms as SBP variability increased

Hyperkalaemia increased with finerenone versus placebo and **across SBP variability quartiles, but rates of hospitalisation and discontinuation were low**

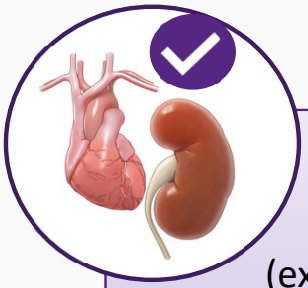
% of TEAEs and serious TEAEs across treatment groups



	Q1		Q2		Q3		Q4	
	Finerenone (n=1437)	Placebo (n=1417)	Finerenone (n=1398)	Placebo (n=1455)	Finerenone (n=1441)	Placebo (n=1413)	Finerenone (n=1451)	Placebo (n=1403)
Hyperkalaemia, n (%)	166 (11.6)	83 (5.9)	191 (13.7)	111 (7.6)	220 (15.3)	122 (8.6)	282 (19.4)	151 (10.8)
Serious TEAEs	7 (0.5)	2 (0.1)	13 (0.9)	3 (0.2)	21 (1.5)	2 (0.1)	20 (1.4)	4 (0.3)
Discontinuation	1 (<0.1)	0 (0.0)	2 (0.1)	1 (<0.1)	2 (0.1)	0 (0.0)	3 (0.2)	1 (<0.1)
Hospitalisation	6 (0.4)	2 (0.1)	11 (0.8)	2 (0.1)	19 (1.3)	2 (0.1)	17 (1.2)	0 (0.0)

Q, quartile; SBP, systolic blood pressure; TEAE, treatment-emergent adverse event

Conclusions



Higher SBP variability (expressed as SD, CoV, and VIM) was associated with **increased risk of CV and kidney outcomes**

FIDELITY

Finerenone lowered the risk of CV and kidney outcomes vs placebo irrespective of SBP variability, and did not increase SBP variability vs placebo

Hyperkalaemia and TEAEs were similar across treatment arms and SBP variability quartiles, and **increased** as **SBP variability increased**

- High **pre-treatment SBP variability (especially CoV)** may be a **good predictor of CV outcomes**
- Treatment effect of finerenone was **not modified by SBP variability** and may confer benefit compared with placebo in those with high SBP variability
- **Finerenone did not increase SBP variability compared with placebo**

CoV, coefficient of variation; CV, cardiovascular; SBP, systolic blood pressure; SD, standard deviation; TEAE, treatment-emergent adverse event; VIM, variation independent of the mean