

# Cardiovascular Events in CKD-5D Patients on Maintenance Hemodialysis Therapy and Renin-Angiotensin Blockade - A Bicentric Retrospective Study

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## OBJECTIVES

According to the USRDS and the 4D study, cardiovascular disease is the lead cause of mortality on hemodialysis. (Figure 1). (1-3)

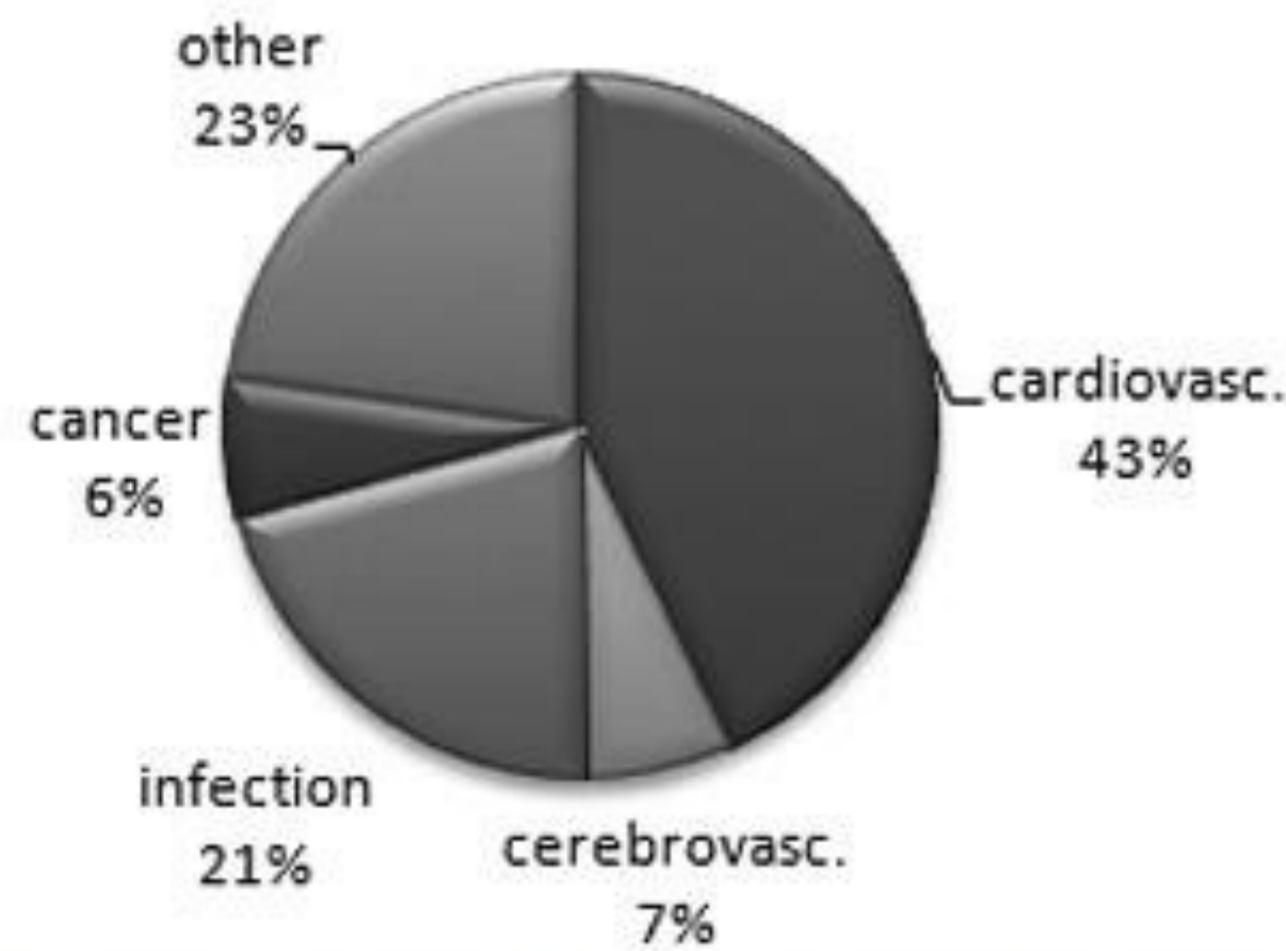


Figure 1. Causes of death according to US Renal Data System.

This double-center retrospective study aims  
→ to compare and assess lethal and non-lethal cardiovascular events on two cohorts from different countries  
→ the influence of Renin-Angiotensin Blockade on these events

## METHODS

→ Salford Royal Foundation Trust Dialysis Unit -201 patients (UK) versus BBraun Avitum Dialysis Unit Timisoara 103 patients (RO), analyzed from 2013-2016.

→ Initial cohort characteristics (depicted below Table 1) – showed heterogeneous groups

Variable	UK group		Romania group	
	n	Value	n	Value
Age (yrs)	201	58.5 +/- 7.5	103	57.3 +/- 10.65
Sex (%men)	201	67.16%	103	68.9%
HD vintage (yrs)	201	7 +/- 4.94	103	3.95 +/- 3.48
Access (AVF%)	201	87.5	103	92
Smoking –active/former (%)	201	65	103	26.2
Diabetes mellitus (%)	201	62	103	26.2
CHF (%)	201	13.4	103	8.7
MI/ACS (%)	201	11.44	103	11.65
Angina (%)	201	16.4	103	50.4
CABG (%)	201	6.9	103	0.97
Coronary angioplasty(%)	201	14.9	103	0
PVD (%)	201	7.96	103	25.2
Stroke/TIA (%)	201	9.95	103	13.5
Hypertension (%)	201	59.2	103	91.2
Renal tx (%)	201	11.94	103	4.85
RAB (ACE-I/ARB) (%)	201	41.79	103	41.74

Table 1. Comparative initial demographics, previous cardiovascular comorbidities, previous failed transplantation, RAB treatment (ACE-I/ARB) HD- hemodialysis, CHF- congestive heart failure, MI-myocardial infarction, ACS- acute coronary syndrome, CABG- coronary artery by-pass graft, PVD-peripheral vascular disease, TIA- transitory ischemic attack RAB- renin angiotensin blockade.

## RESULTS

→ At the end of the 3 year study period:

- Similar 3-year overall mortality: 26.3% (RO) VS. 25.2% (UK) and cardiovascular mortality 9.45 (RO) VS. 10.67 (UK)

Figure 2. 3-year overall mortality UK vs RO.

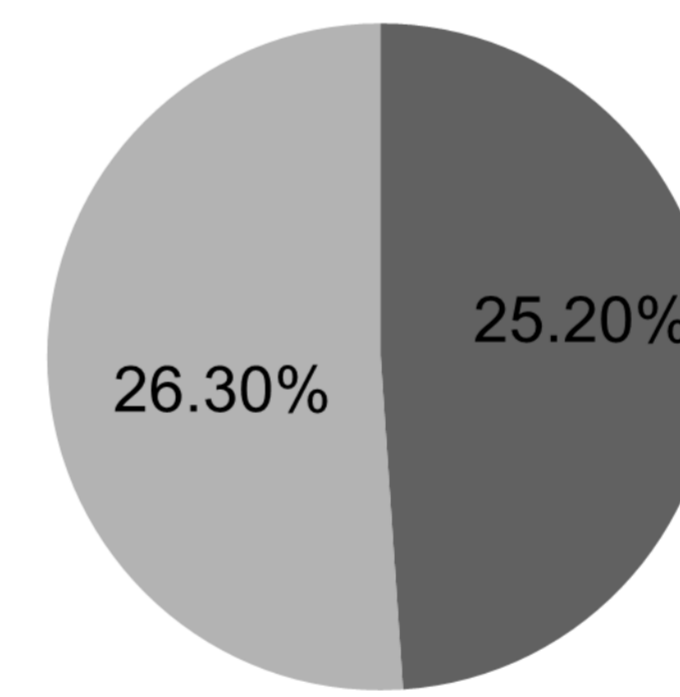
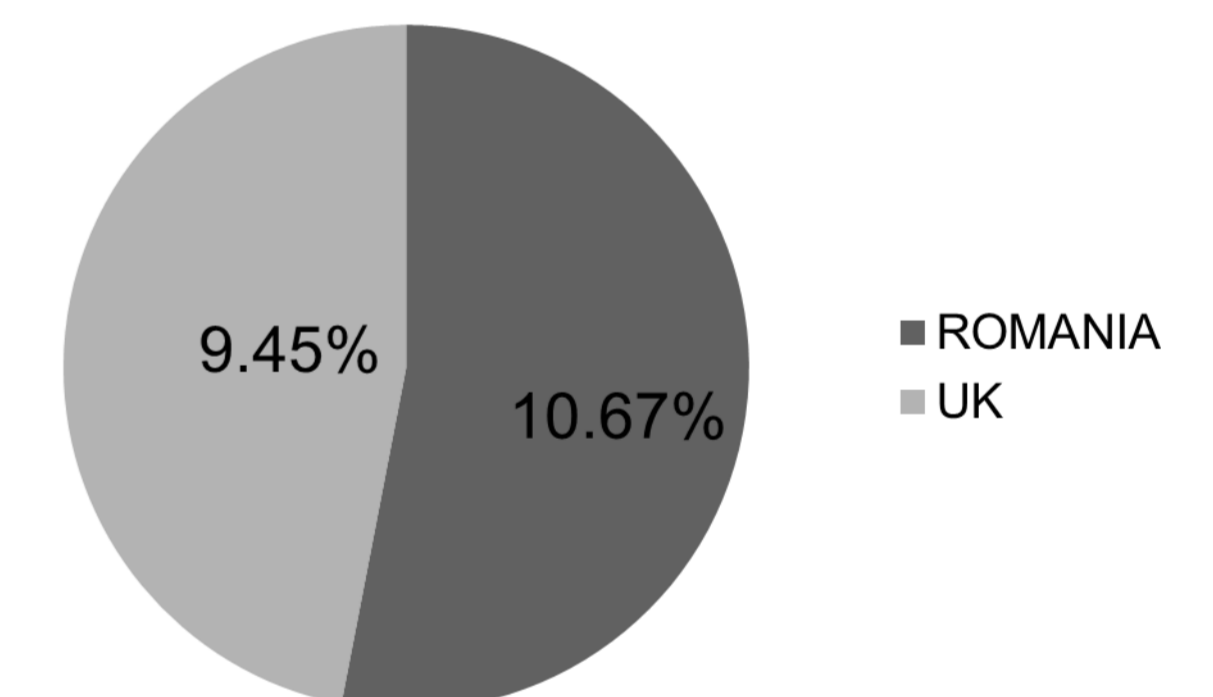


Figure 3. 3-year cardiovascular cause mortality UK vs RO.



- Similar ACE-I/ ARB treatment in patients upon study initiation 41.79 % (UK) VS 41.74% (RO)
- The only differences in 3-year outcomes: **angina pectoris** (more frequent in RO) and **renal transplantation** (more frequent UK)
- Univariate Kaplan Meier analysis →

VARIABLE	UK	RO
History of Diabetes Mellitus	0.05	0.55
History of Myocardial Infarction	0.03	0.02
ACE-I / ARB treatment	0.03	0.86

Table 4. Factors associated with lethal and non-lethal cardiovascular events on the two different cohorts (UK vs RO)

- Multivariate analysis → only relevant factor associated with new cardiovascular events → **History of Diabetes Mellitus**
- **Renin-angiotensin blockade showed no positive effect on cardiovascular events.**

## REFERENCES:

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Event	UK group	Romania group	p
All-cause mortality (%)	26.3	25.2	0.8
Transplant (%)	16.9	1.94	0.0014
Cardiovascular – cause mortality (%)	9.45	10.67	0.72
MI (%)	9.95	5.82	0.22
Angina (%)	2.98	8.73	0.02
CABG (%)	0.49	0.97	0.63
Angioplasty (%)	1.49	0	0.21
CHF (%)	13.9	7.76	0.11
Stroke (%)	4.97	4.85	0.96
PVD (%)	0.99	2.91	0.21
Total cardiovascular events (%)	24.3	24.2	0.98

Table 2. Three year outcomes – cardiovascular lethal and non-lethal events, transplantation, all cause mortality – differences between the two cohorts

Cardiovascular event	UK group	Romania group
Myocardial infarction	0.08	0.62
Angina	0.03	0.13
Cardiac failure	0.009	0.99
Stroke/TIA	0.9	0.43
Peripheral vascular disease	0.8	0.73

Table 3. Renin- Angiotensin Blockade (ACE-I, ARB) association with cardiovascular events

## CONCLUSIONS

Although the two groups belong to different geographical regions and show demographic diversity, they had similar retrospective lethal and non-lethal cardiovascular events.

Whereas ACEI/ARB treatment was concerned, this did not have any impact either on any new cardiovascular events or on global/cardiovascular mortality both in the UK group as well as in the RO group.