

Long-term Outcome in Patients with Takotsubo Syndrome: A single-center Study from Vienna

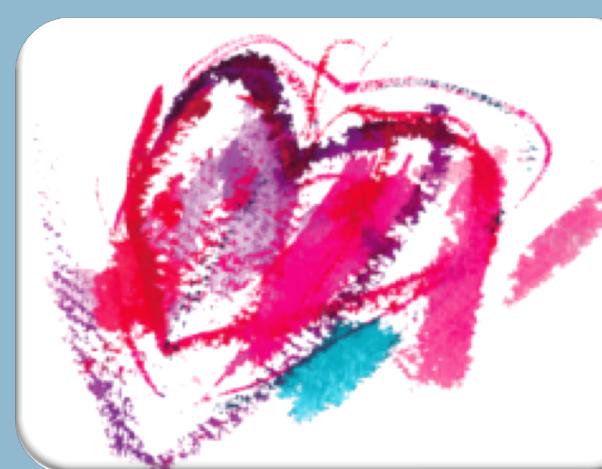
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BACKGROUND

There is an increasing amount of evidence suggesting multiple fatal complications in Takotsubo Syndrome. However, findings on the long-term outcome are scarce and show inconsistent evidence.

PURPOSE and METHODS

- single-center study of long-term prognosis in Takotsubo patients admitted to Klinik Ottakring, Vienna, Austria, from 09/2006 to 08/2019
- We investigated the clinical features, prognostic factors and outcome of patients with Takotsubo syndrome

RESULTS

- 174 patients included, median follow-up was 126 months
- The most common cause of death was a non-cardiac cause (71,4% of all deaths), especially malignancies (26,5% of all deaths).
- non-survivors were older and more often men with more comorbidities (chronic kidney disease, malignancy).
- Age was the only independent prognostic factor of cardiovascular mortality (HR=1,11, CI: 0,99-1,25, p=0,05)
- Female gender (HR=0,32, CI: 0,16-0,64, p<0,001), cancer (HR=2,35, CI: 1,15-4,8, p=0,019) and chronic kidney disease (HR=2,61, CI: 1,11-6,14, p=0,028) showed to be independent predictors of non-cardiovascular mortality

CONCLUSION

Long-term prognosis of Takotsubo patients is not favourable, mainly due to non-cardiac comorbidities. Hence, ^{0,95 (0,91-1,00)} consequent outpatient care in relatively short time intervals after Takotsubo event based on risk factor control and early detection of malignancies seems mandatory.

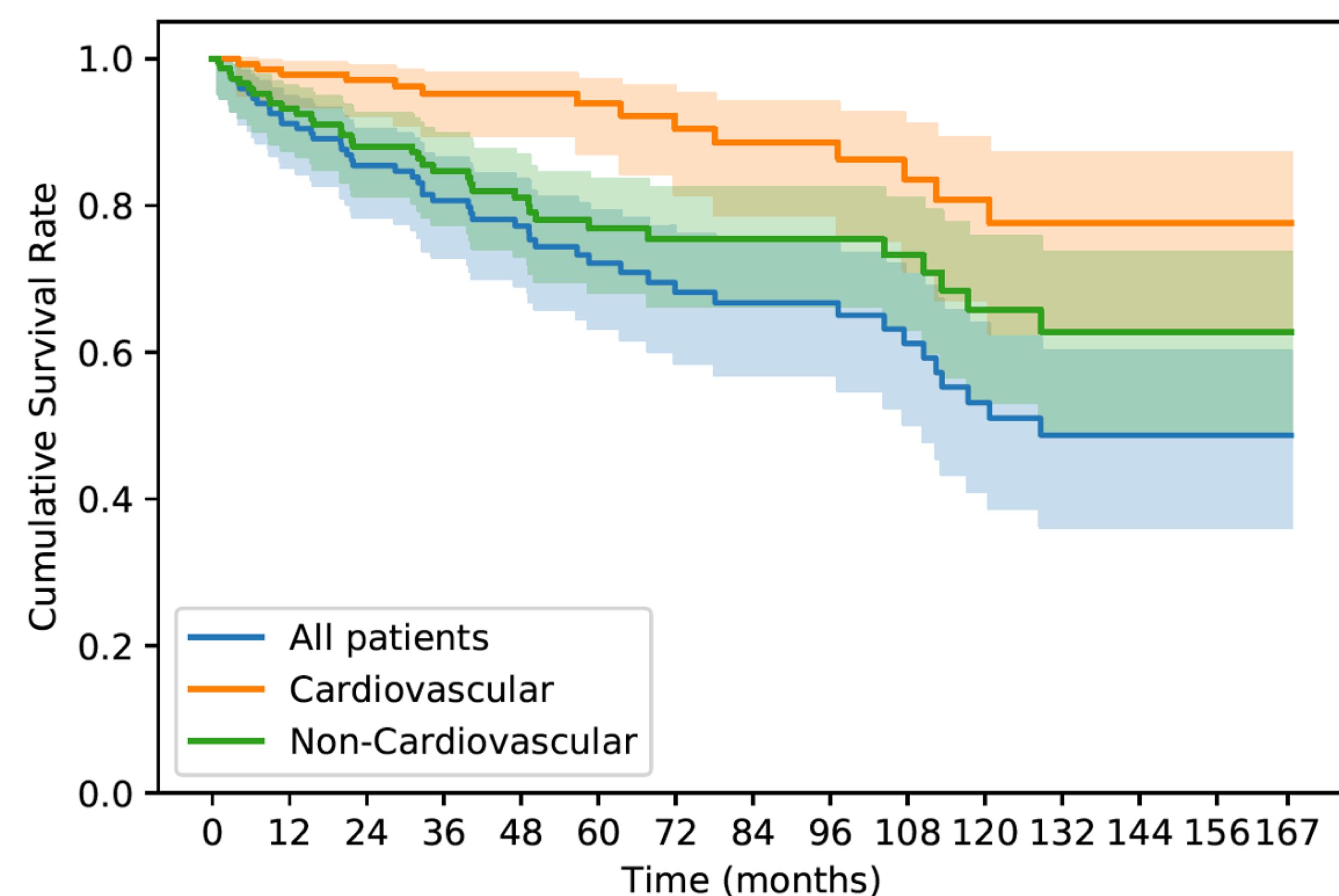


Figure 1. Kaplan-Meier curve for long-term mortality in patients with Takotsubo syndrome.
Blue- all-cause mortality, orange- cardiovascular mortality, green- non-cardiovascular mortality

Cause of death, n (%)	49 (33,3)
Cardiovascular death	14 (28,6)
Heart failure	3 (6,1)
Coronary artery disease	5 (10,2)
Hypertensive crisis	2 (4,1)
Stroke	4 (8,2)
Non-cardiovascular death	35 (71,4)
Cancer	13 (26,5)
Lung	6 (12,2)
Pancreas	1 (2,0)
Colon	1 (2,0)
Rectum	1 (2,0)
Endometrium	1 (2,0)
Prostate	1 (2,0)
Unknown origin	2 (4,1)
Respiratory tract	7 (14,3)
Chronic obstructive pulmonary disease	2 (4,1)
Pneumonia	5 (10,2)
Abdominal	6 (12,2)
Cirrhosis hepatis	2 (4,1)
Cholecystitis	1 (2,0)
Diverticulosis with perforation	2 (4,1)
Peritonitis	1 (2,0)
Other	
Kidney failure	1 (2,0)
Dementia	2 (4,1)
Trauma	2 (4,1)
Unknown cause	4 (8,2)

Table 1. Cause of death in patients with Takotsubo Syndrome.

Patients' characteristics	All TTS Patients N=147	Survived TTS population N=98	TTS population with death in follow-up N= 49	p-value
Age, yrs (mean, ±SD)	70 (±12,3)	68 (±12,6)	74 (±10,4)	0,003
Female, n (%)	125 (85,0)	88 (89,8)	37 (75,5)	0,022
Hypertension, n (%)	99 (67,3)	63 (64,3)	36 (73,5)	ns
Hyperlipidemia, n (%)	51 (34,7)	37 (37,8)	14 (28,6)	ns
Diabetes mellitus, n (%)	30 (20,4)	23 (23,5)	7 (14,3)	ns
History of myocardial infarction, n (%)	9 (6,1)	5 (5,1)	4 (8,2)	ns
COPD	32 (21,8)	19 (19,4)	13 (26,5)	ns
Chronic kidney disease	17 (11,6)	6 (6,1)	11 (22,4)	0,004
Cancer				
• Previous history of cancer	8 (5,4)	12 (12,2)	13 (26,5)	0,030
• Cancer during the event	25 (17,0)	3 (3,1)	5 (10,2)	ns
Trigger, n (%)				
Emotional	31 (21,1)	26 (26,5)	5 (10,2)	0,022
Physical	58 (39,5)	33 (33,7)	25 (51,0)	0,043
Non identifiable/unknown	36 (24,5)	28 (28,6)	21 (42,8)	ns
EF at baseline, % (mean, ±SD)	48,9 (±13,9)	50,4 (±13,4)	46,0 (±14,8)	ns
Laboratory values at admission				
• Troponin I, ng/mL (median, IQR)	2,1 (3,7)	2,6 (5,2)	1,5 (4,2)	ns
• CK, U/L (median, IQR)	200 (3315)	218 (216)	188 (308)	ns
• CK-MB, U/L (median, IQR)	39,5 (242)	39 (26)	42 (42)	ns
Coronary artery disease, n (%)				
• Bland coronary arteries	72 (51,4)	45 (48,4)	27 (57,4)	ns
• Non-significant coronary artery disease, (< 50% stenosis)	59 (42,1)	42 (45,2)	17 (36,2)	ns
• Coronary artery disease, (stenosis ≥ 50%)	9 (6,4)	6 (6,5)	3 (6,4)	ns
Discharge therapy				
Beta Blockers, n (%)	97 (66,9)	62 (63,9)	35 (72,9)	ns
ACE-inhibitors/ ARBs, n (%)	89 (61,4)	62 (63,9)	27 (56,3)	ns
Calcium Channel blockers, n (%)	11 (7,6)	8 (8,2)	3 (6,3)	ns
Diuretics, n (%)	52 (35,4)	28 (28,9)	24 (50,0)	0,013
Acetylsalicylic acid, n (%)	123 (83,6)	78 (80,4)	42 (87,5)	ns
P2Y12 inhibitors, n (%)				
• clopidogrel	57 (39,3)	43 (44,3)	14 (29,2)	ns
• prasugrel	1 (0,7)	1 (1,0)	0	ns
• ticagrelor	3 (2,1)	2 (2,1)	1 (1,2)	ns
Oral anticoagulation, n (%)	32 (21,8)	19 (19,4)	13 (26,5)	ns

Table 2. Patients' characteristics, clinical presentation during the onset of event and discharge therapy. Comparison between survivors and non-survivors.

ACE- angiotensin-converting enzyme, ARB- angiotensin II receptor blockers, BMI- body mass index, CK- creatinine kinase, CK-MB- creatinine kinase myocardial band, COPD- chronic obstructive pulmonary disease, EF- ejection fraction, IQR- interquartile range, MI- myocardial infarction, SD- standard deviation, TTS-Takotsubo Syndrome, yrs- years

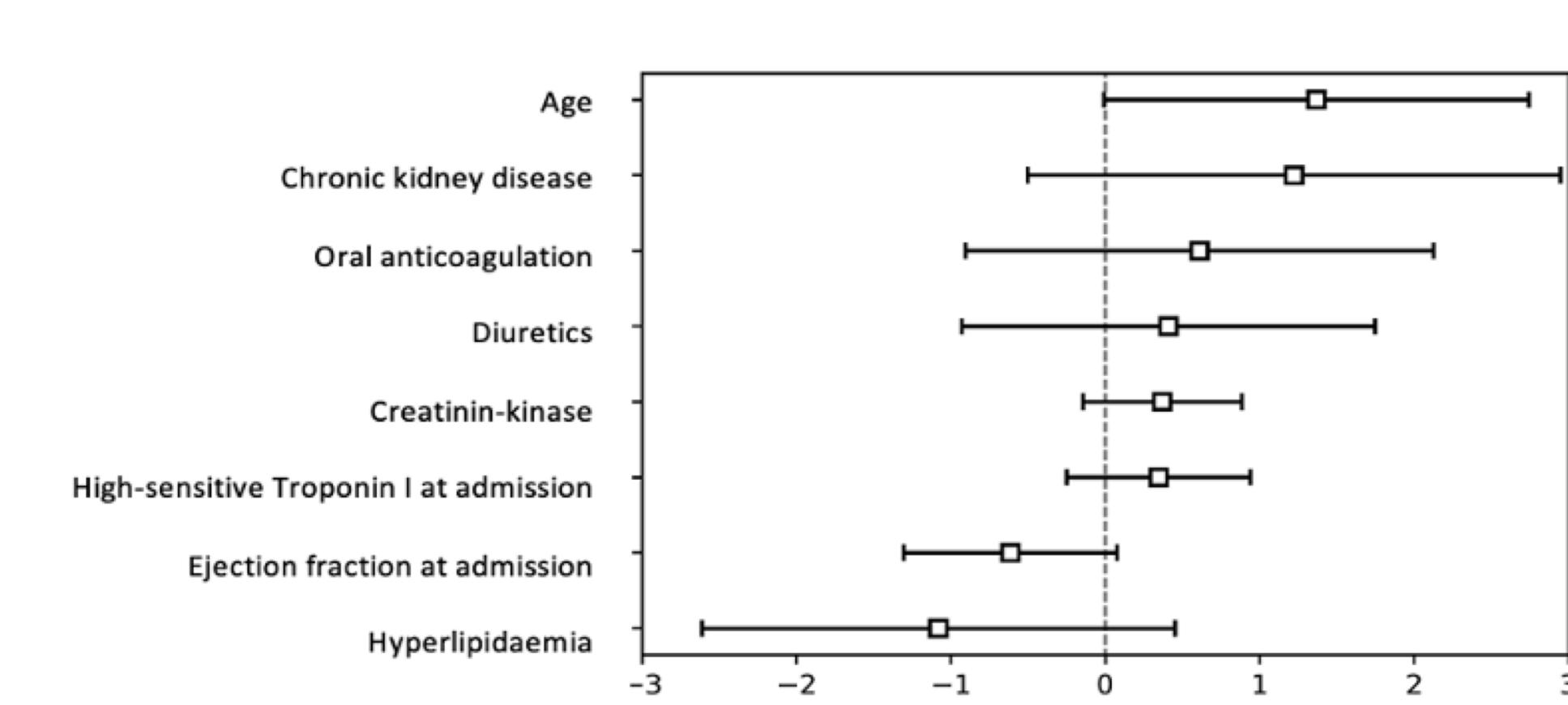


Figure 2. Variables associated with cardiovascular mortality in multivariate cox regression analysis for the clinically significant patients features and discharge therapy.

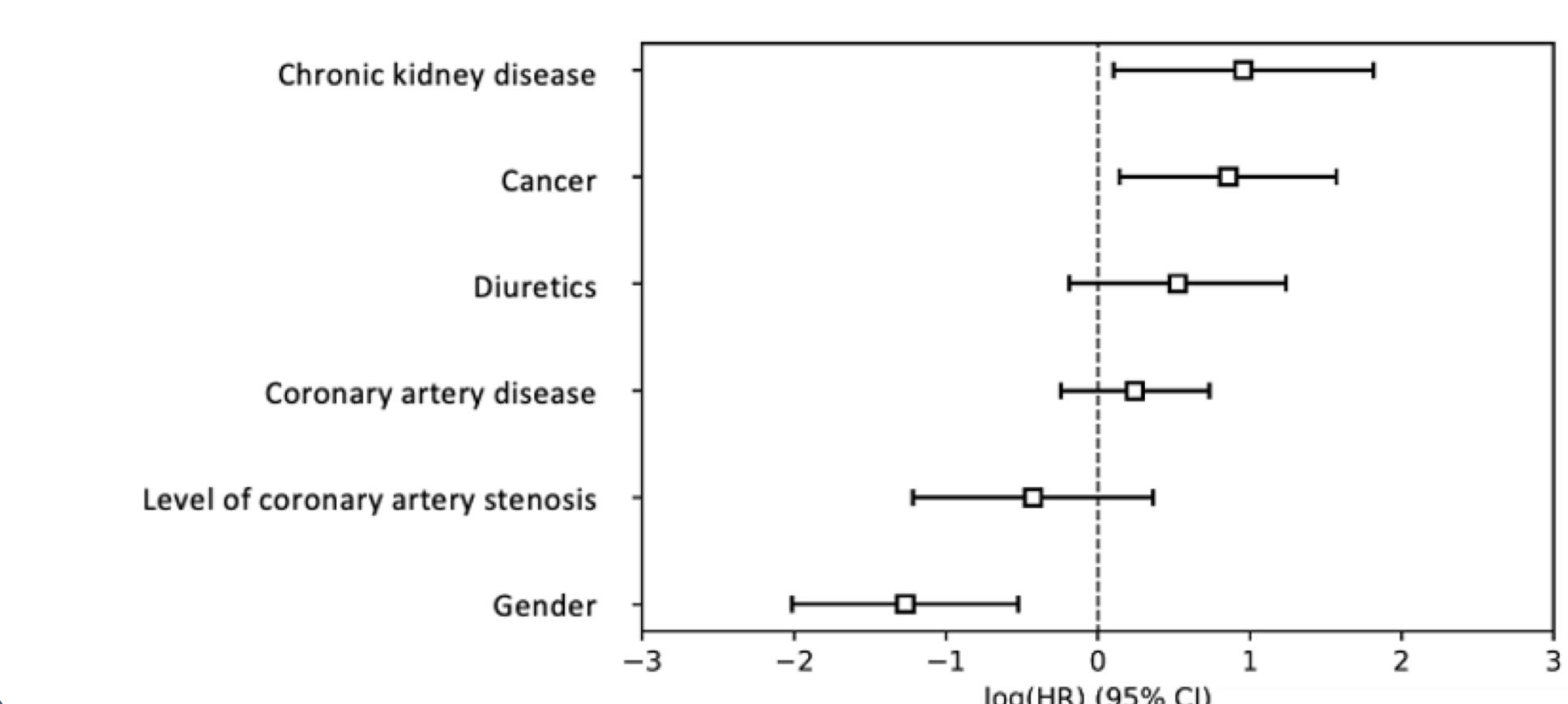


Figure 3. Variables associated with non-cardiovascular mortality in multivariate cox regression analysis for the clinically significant patients features and discharge therapy.