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The impact of severe depression on the survival of older patients with end-stage kidney disease

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Objectives: Incidence of depression increases in patients with end-stage kidney disease (ESKD). We evaluated the association between depression and mortality among older patients with ESKD, which has not been studied previously.

Methods: This nationwide prospective cohort study included 487 patients with ESKD aged > 65 years, who were categorized into minimal, mild-to-moderate, and severe depression groups based on their Beck Depression Inventory-II (BDI-II) scores. BDI-II scores were separated into three symptom domains: affective, cognitive, and somatic depressive symptoms. The association between the depression groups and survival were analyzed using multivariate Cox proportional hazard regression models. Predisposing factors for high BDI-II scores were evaluated using logistic regression analysis. The associations among the three depressive-symptom domains and survival were also analyzed.

Results: The severe depression group showed a higher modified Charlson comorbidity index value and lower serum albumin, phosphate, and uric acid levels than the other depression groups. The Kaplan–Meier curve revealed a significantly lower survival in the severe depression group than in the minimal and mild-to-moderate depression groups ($P = 0.011$). Multivariate Cox regression analysis confirmed that severe depression was an independent risk factor for mortality in the study cohort [hazard ratio(HR), 1.39; 95% confidence interval (CI), 1.01–1.91; $P = 0.041$). BDI-II scores were associated with modified Charlson comorbidity index ($P = 0.009$) and serum albumin level ($P = 0.004$) in multivariate linear regression. Among the three depressive symptoms, higher somatic symptom scores were associated with increased mortality (HR, 2.45; 95% CI, 1.25–4.79; $P = 0.009$).

Conclusions: Among older patients with ESKD, severe depression increases mortality compared with minimal or mild-to-moderate depression. And patients with concomitant somatic symptoms require careful management of their comorbidities and nutritional status.

Table 1. Associations of depression and mortality in Cox proportional hazard regression model

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	Model 1		Model 2		Model 3		Model 4	
	HR (95% CI)	*P* value	HR (95% CI)	*P* value	HR (95% CI)	*P* value	HR (95% CI)	*P* value
Depression group								
Minimal	Reference		Reference		Reference		Reference	
Mild-to-moderate	1.07 (0.78–1.48)	0.667	1.12 (0.81–1.55)	0.503	0.98 (0.71–1.37)	0.922	0.98 (0.70–1.38)	0.918
Severe	1.53 (1.13–2.09)	0.007	1.49 (1.09–2.03)	0.012	1.39 (1.02–1.90)	0.038	1.39 (1.01–1.91)	0.041

Model 1: unadjusted.

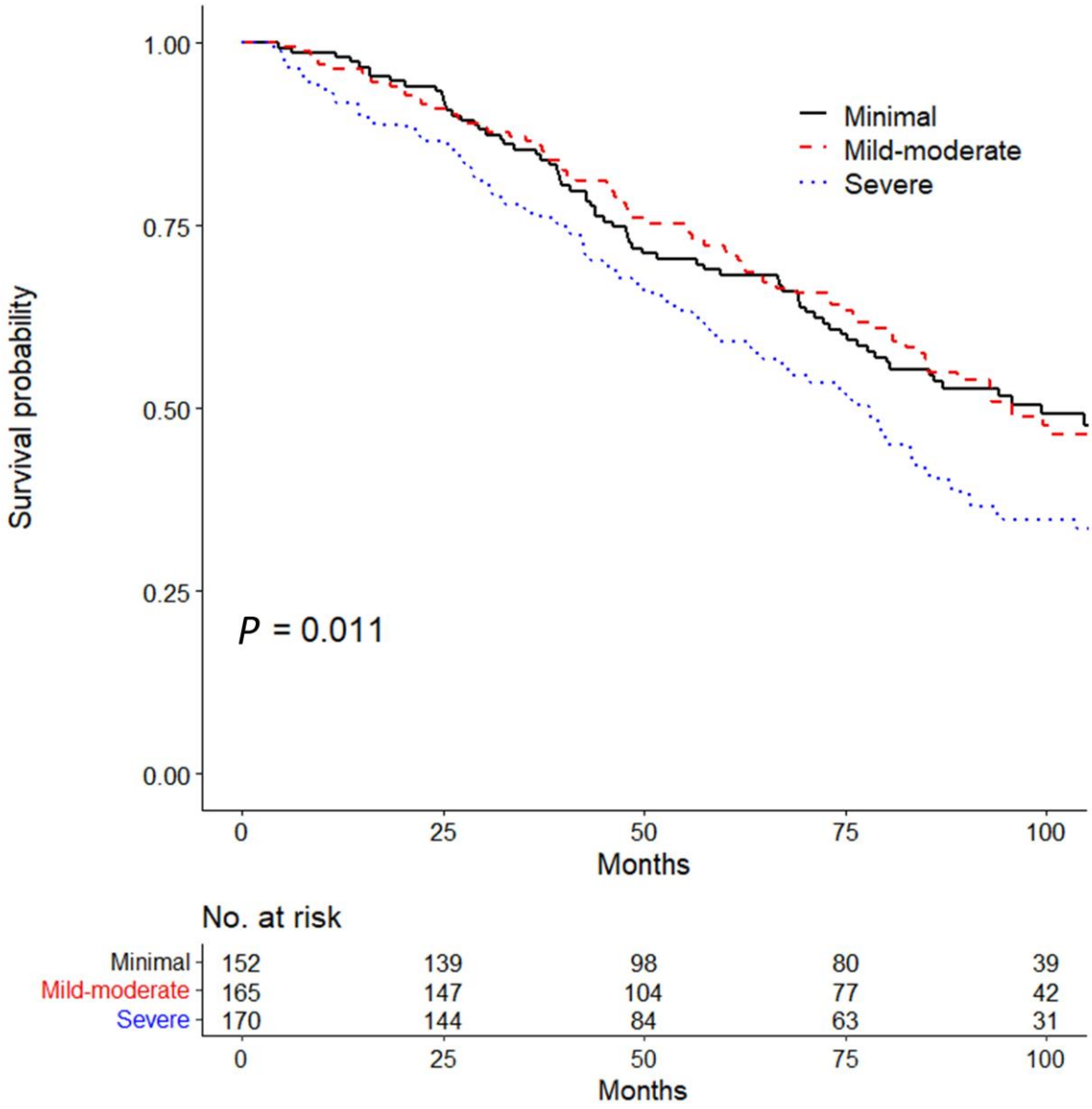
Model 2: adjusted for age and sex.

Model 3: adjusted for age, sex, and mCCI.

Model 4: adjusted for age, sex, mCCI, albumin, phosphate, and uric acid.

Abbreviations: BDI-II, Beck Depression Inventory-II; HR, hazard ratio; CI, confidence interval; mCCI, modified Charlson comorbidity index.

Figure 1. Kaplan-Meier curve for mortality in depression groups.


1.00
0.75
0.50
0.25
0.00
Survival probability
Minimal
Mild-moderate
Severe
P = 0.011
0
25
50
75
100
Months
No. at risk
Minimal 152 139 98 80 39
Mild-moderate 165 147 104 77 42
Severe 170 144 84 63 31
0
25
50
75
100
Months