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Association between risk of obstructive sleep apnea and cardiovascular disease in patients with end-stage renal disease

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Objectives : This study aims to investigate the relationship between the STOP-BANG score, which quantifies the risk of OSA, and the prevalence of CVDs in hemodialysis patients.
Methods : This cross-sectional study included patients aged ≥18 years with kidney failure undergoing hemodialysis, recruited from the hemodialysis unit of a tertiary hospital in August 2023. The STOP-BANG score, assessed using an eight-item questionnaire, was categorized into three groups: low (0–2), moderate (3–4), and severe (5–8 or meeting specific criteria for severe risk). The primary outcomes were the prevalence of CVDs, including ischemic heart disease, ischemic stroke, hemorrhagic stroke, atrial fibrillation, and heart failure, as identified through ICD-10 and OPCS-4 codes. Multivariable logistic regression analysis was performed.
Results : Among the 130 participants (median age: 62.9 years; male: 53.8%), the prevalence of CVDs was as follows: ischemic heart disease (36.9%), ischemic stroke (19.2%), hemorrhagic stroke (4.6%), atrial fibrillation (23.8%), and heart failure (33.1%). In multivariable logistic regression analysis for ischemic stroke, the adjusted odds ratio (adj-OR) per unit increase in STOP-BANG score was 2.11 (95% CI: 1.37–3.23, P = 0.001). Patients in the high-risk OSA group had significantly higher odds of ischemic stroke (adj-OR: 9.71, 95% CI: 1.10–85.95, P = 0.041). For atrial fibrillation, the adj-OR per unit increase in STOP-BANG score was 1.82 (95% CI: 1.21–2.75, P = 0.004). High-risk OSA patients also had significantly increased odds of AF (adj-OR: 5.79, 95% CI: 1.03–32.55, P = 0.046). There were no significant associations with ischemic heart disease, hemorrhagic stroke, and heart failure.
Conclusions : A higher STOP-BANG score, indicating increased OSA risk, was significantly associated with ischemic stroke and atrial fibrillation in hemodialysis patients. Identifying high-risk patients using the STOP-BANG score can aid in screening and may help guide interventions, such as CPAP therapy, to reduce cardiovascular risk.

figure1.PNG

Outcome						
	Univariable			Multivariable [a]		
Atrial fibrilation	OR	95% CI	P-Value	OR	95% CI	P-Value
Continuous	1.58	1.15 - 2.19	0.005	1.82	1.21 - 2.75	0.004
Categorical						
Low risk						
Moderate risk	3.17	0.66 - 15.37	0.151	3.17	0.58 - 17.40	0.185
High risk	4.80	1.00 - 22.99	0.050	5.79	1.03 - 32.55	0.046
Ischemic stroke	OR	95% CI	P	OR	95% CI	P
Continuous	1.81	1.26 - 2.59	0.001	2.11	1.37 - 3.23	0.001
Categorical						
Low risk						
Moderate risk	4.21	0.50 - 35.35	0.185	3.59	0.40 - 32.36	0.255
High risk	9.17	1.13 - 74.30	0.038	9.71	1.10 - 85.95	0.041

[a]Adjusted for diabetes, total cholesterol, Triglyceride, calcium, phosphorus, PTH, and CRP

figure1.PNG

Outcome						
	Univariable			Multivariable [a]		
Hemorrhagic stroke	OR	95% CI	P	OR	95% CI	P
Continuous	0.92	0.48 - 1.74	0.790	0.93	0.45 - 1.94	0.849
Categorical						
Low risk						
Moderate risk	1.69	0.18 - 16.01	0.646	0.86	0.07 - 10.95	0.908
High risk	0.44	0.03 - 7.36	0.568	0.23	0.01 - 5.16	0.357
Ischemic heart disease	OR	95% CI	P	OR	95% CI	P
Continuous	1.33	1.00 - 1.76	0.049	1.35	0.97 - 1.87	0.073
Categorical						
Low risk						
Moderate risk	3.07	0.92 - 10.25	0.068	3.87	1.02 - 14.60	0.046
High risk	3.60	1.07 - 12.11	0.038	3.74	0.96 - 14.55	0.057
Heart failure	OR	95% CI	P	OR	95% CI	P
Continuous	1.12	0.85 - 1.48	0.428	1.16	0.85 - 1.59	0.349
Categorical						
Low risk						
Moderate risk	1.45	0.49 - 4.30	0.497	1.41	0.43 - 4.56	0.569
High risk	1.55	0.52 - 4.61	0.435	1.58	0.47 - 5.28	0.460

[a]Adjusted for diabetes, total cholesterol, Triglyceride, calcium, phosphorus, PTH, and CRP