

Reduced risk of bleeding complications in patients with renal insufficiency and acute coronary syndromes treated with low-molecular-weight heparin: insights from GRACE

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Background: Risk of bleeding complications increases when UFH is combined with GP IIb/IIIa inhibitors in ACS patients, particularly with declining renal function. Combination therapy comprising LMWH and GP IIb/IIIa inhibitors is well tolerated and may improve outcomes in ACS patients. The aim of this study is to compare the risk of major bleeding in patients with normal renal function or renal insufficiency who are treated with UFH or LMWH.

Methods and results: Data were available for 11,962 patients. The relative risk of major bleeding adjusted for age, diabetes, hypertension, thrombolytics, cardiac catheterization and PCI is reported (Table). Reduced

renal function was more frequent in older patients. In patients treated with LMWH, the risk of severe hemorrhage was 60 to 90% lower than that in patients who received UFH. Treatment comprising GP IIb/IIIa and UFH in individuals with renal insufficiency increases the risk approximately fourfold, whereas LMWH halves this increased risk. Thienopyridines (ticlopidine, clopidogrel) increase hemorrhagic risk to a similar extent when combined with either heparin.

Conclusion: In ACS patients with renal insufficiency, the risk of bleeding complications is lower with LMWH than with UFH.

Creatinine clearance	<30 mL/min	30-60 mL/min	60-90 mL/min	>90 mL/min
Variable	OR (CI)			
LMWH	0.31 (0.11, 0.86)	0.37 (0.18, 0.76)	0.36 (0.15, 0.86)	0.11 (0.03, 0.46)
UFH+GP IIb/IIIa	4.07 (1.44, 11.53)	3.74 (1.91, 7.30)	3.78 (1.79, 8.00)	1.34 (0.49, 3.63)
LMWH+GP IIb/IIIa	2.15 (0.24, 18.88)	0.88 (0.12, 6.65)	No data	1.29 (0.17, 10.03)
UFH+thienopyridine	2.25 (0.88, 5.79)	2.69 (1.46, 4.95)	1.63 (0.73, 3.66)	0.86 (0.36, 2.06)
LMWH+thienopyridine	0.92 (0.11, 7.42)	2.34 (1.04, 5.27)	2.70 (1.16, 6.31)	1.03 (1.00, 1.06)

Table. Risk of major bleeding (including hemorrhagic stroke) according to renal function and treatment (UFH is referent group).

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