

# Non-inferiority of Bivalirudin Versus Heparin in Cardiac Outcomes Reduction But Superiority in Reduction of Bleeding in Acute Coronary Syndrome and PCI: A Meta- Analysis



Sarabjeet Singh MD, Janos Molnar MD, Rohit Arora, MD  
Chicago Medical School / Veterans Affairs Hospital , North Chicago

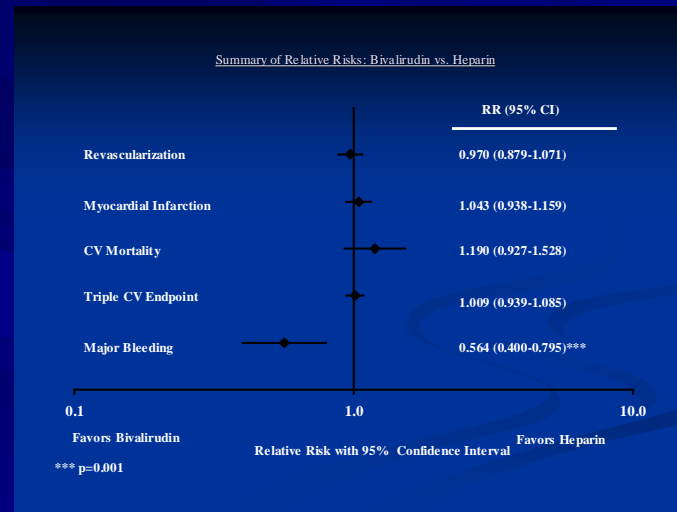


## INTRODUCTION

Recognition of limitations of heparin and the importance of bound thrombin as a trigger of intracoronary thrombus formation in acute coronary syndrome (ACS) prompted clinical evaluation of a class of anticoagulation: Direct thrombin inhibitors (example- bivalirudin) specifically designed to inactivate thrombin. We evaluated cardiac outcomes with bivalirudin vs heparin in management of ACS, including patients undergoing percutaneous coronary interventions (PCI).

## METHODS

Five randomized controlled trials (BAT, CACHET, REPLACE 1, REPLACE-2 and ACUITY); [1-5] comparing bivalirudin to heparin (with or without GP IIb/IIIa inhibitors) in ACS/PCI were identified. The meta-analysis consisted of 25,457 patients. Bivalirudin, 1, 5077; heparin, 10,380). Statistical analysis: The combined relative risks (RR) across all the studies and the 95%



## RESULTS

Compared to heparin, the risk of death, MI, revascularization, and composite ischemic endpoints were identical with bivalirudin therapy (Figure 1). However, the risk of major bleeding was significantly lower with bivalirudin use

## CONCLUSION

The present meta-analysis suggests that bivalirudin may be superior to heparin plus GP IIb/IIIa inhibitors in reducing major bleeding. Additionally, bivalirudin is non-inferior to heparin plus GP IIb/IIIa inhibitors, in the reduction of cardiac events.

confidence intervals were computed. The Mantel-Haenszel fixed-effect model was used to calculate combined relative risks for those outcomes that the studies were homogenous. Under the fixed effect model, it is assumed that all studies came from a common population and that the effect size is not significantly different among the different trials. This assumption was tested by heterogeneity test for each outcome. If this test yields a low p value ( $p < 0.05$ ), then the fixed effect model may be invalid.[1] In this case the random effect model is more appropriate, in which both the random variation within studies and the variation between the different studies are incorporated.[1] The studies were homogeneous for each outcome, except for major bleeding. Accordingly, the random effect model was used to calculate combined relative risk for major bleeding and the fixed effect model was used for all other outcomes. A two-sided alpha error  $< 0.05$  was considered to be significant.

## REFERENCES

1. Lau J, Ioannidis JP, Schmid CH. Quantitative synthesis in systematic reviews. Ann Intern Med. 1997;127(9):820-6.

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