

ATOLL: An international, randomized trial comparing i.v. enoxaparin with i.v. unfractionated heparin in primary PCI for ST-elevation myocardial infarction



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ATOLL: Notable features

- Pre hospital randomization in 70%, radial approach in 67.5%, high use of high dose clopidogrel >66%, IIb/IIIa antagonists 73.6% and thrombectomy 39.2%
- Unusual primary endpoint of death, MI, procedural failure or non-CABG major bleeding: Negative for primary endpoint: RR 0.83, CI 0.68 – 1.01, $p=0.07$
- Underpowered statistically for a realistic 20% reduction in primary endpoint. Confidence limits include a 32% reduction to a 1% increase
- No ranking of secondary endpoints (Hochberg) or adjustment for multiple analyses



ATOLL: Notable features

- No effect on TIMI 3 flow or ST resolution
- No effect on bleeding
- Main secondary ischaemic endpoint (death, recurrent MI/ACS or urgent revascularization) reduced: 11.3% UFH vs 6.7% enoxaparin, $p=0.04$
- Trend for reduction in mortality: 6.35 UFH vs 3.8% enoxaparin, $p=0.049$. In absence of a reduction in infarct size, improved TIMI 3 flow or decreased bleeding, this probably occurred by chance
- Non pre-specified endpoint of death, MI or revascularization reduced: 8.5% UFH vs 5.1% enoxaparin, $p=0.04$

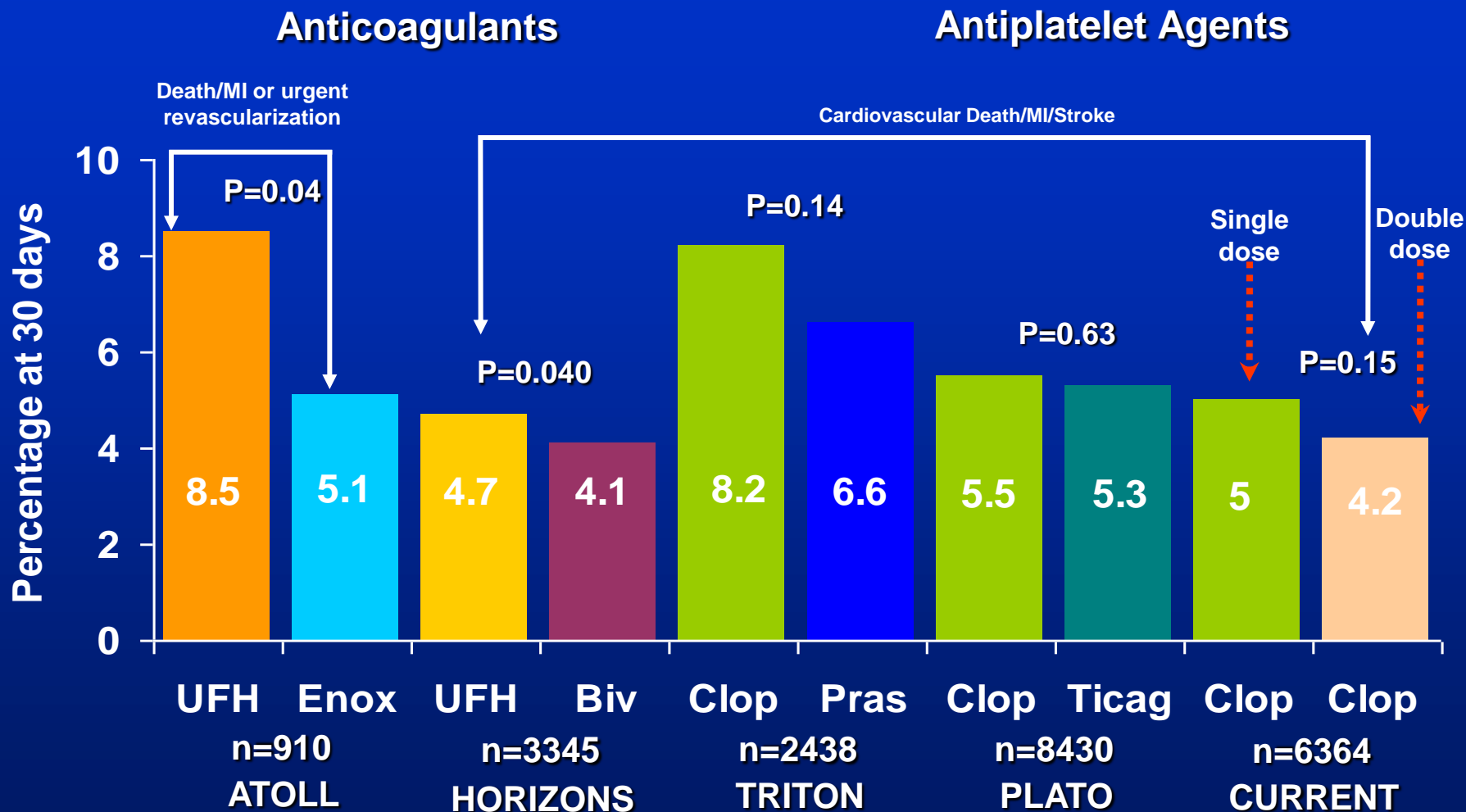


ATOLL: Things I would like to know

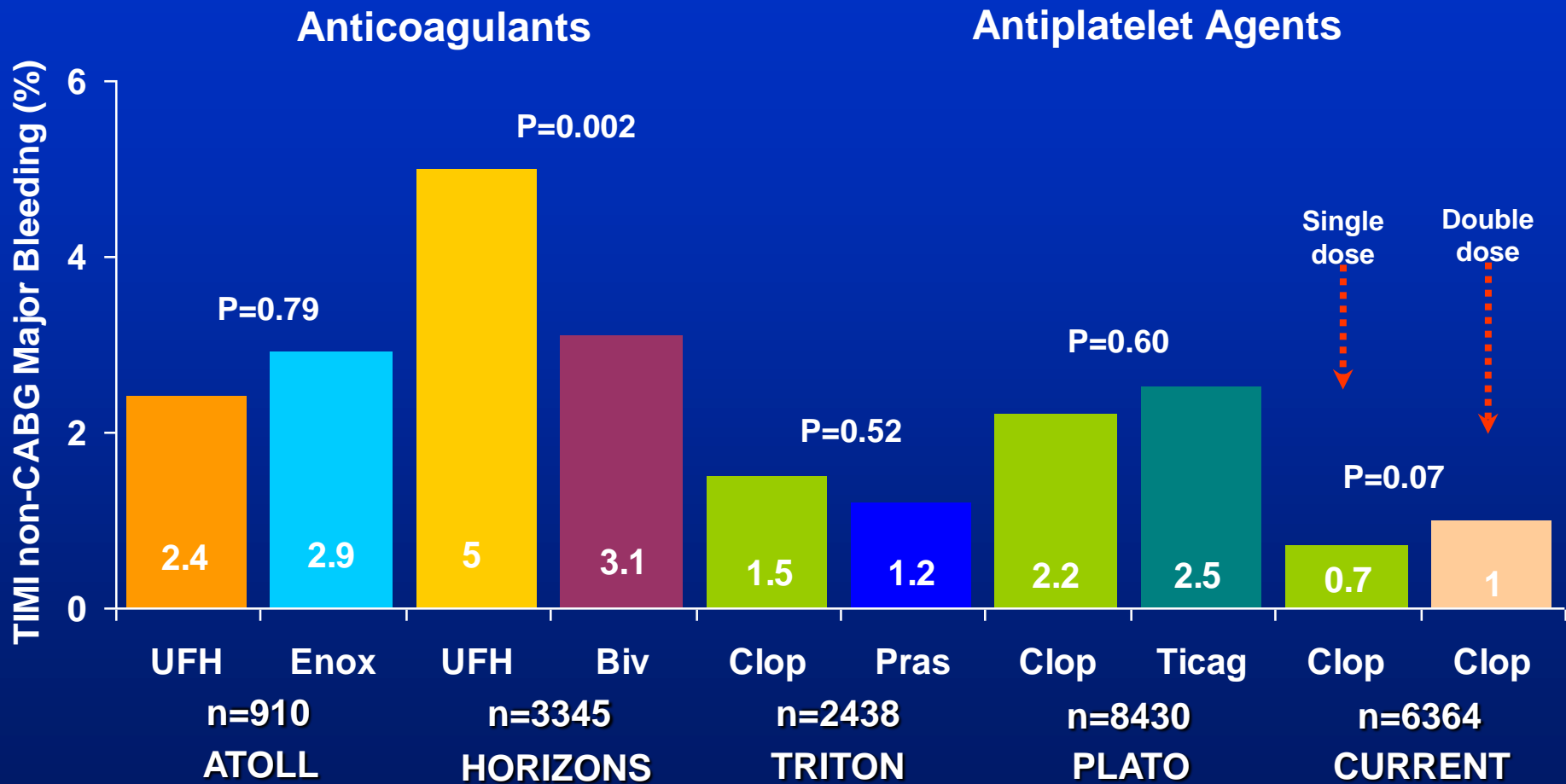
- Comparable endpoints to other primary PCI trials for ischemic endpoints and for bleeding; role of BARC definition
- I would like to see % of patients in Killip Class I
- Role of radial access (67.5%)
- Role of clopidogrel dosing $\geq 600\text{mg}$ ($>60\%$)
- Role of IIb/IIIa antagonists (73.6%).
- Role of thrombectomy (39.2%)
- Role of extended SC injections of enoxaparin
- Effect of therapies on stent thrombosis



Efficacy of anticoagulants and antiplatelet agents in primary PCI according to prespecified endpoints



Bleeding rates with anticoagulants and antiplatelet agents in primary PCI



Conclusions

- The ATOLL investigators have preformed an excellent trial on a background of high use of evidence based therapies
- The role of IIb/IIIa antagonists in the setting of intensive oral antiplatelet therapy (e.g.: clopidogrel 600mg, prasugrel or ticagrelor) is not well defined.
- The ATOLL investigators have shown that enoxaparin is safe and likely has a clinical relevant effect on ischemic endpoints for patients undergoing primary PCI
- They have moved us closer to the goal of further improving the outcomes of patients suffering STEMI.





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