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► **To cite this version:**

Bernardo Cortese. A comment on Laboratory monitoring of new anticoagulants. American Journal of Hematology, 2010, 85 (7), pp.546. 10.1002/ajh.21718 . hal-00552322

HAL Id: hal-00552322

<https://hal.science/hal-00552322>

Submitted on 6 Jan 2011

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Journal:	<i>American Journal of Hematology</i>
Manuscript ID:	AJH-10-0095.R1
Wiley - Manuscript type:	Correspondence
Date Submitted by the Author:	04-Mar-2010
Complete List of Authors:	Cortese, Bernardo; Fondazione IRCCS Ca' Granda, Ospedale Maggiore Policlinico, Cardiologic
Keywords:	Anticoagulation therapy



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A comment on Laboratory monitoring of new anticoagulants

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Disclosures: none.

Word count: 499.

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For Peer Review

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2 To the Editor: In their recent paper, D.D. Castellone and E.M. Van Cott review recent
3 developments in laboratory and bedside testing for some of the newest anticoagulants [1].

4 This review is a clear and easily understandable tool for clinicians, which provides a
5 comprehensive summa of available and lesser available laboratory tests for their preferred
6 anticoagulants (both factor IIa or factor Xa inhibitors).
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9 However, I would like to expand on bivalirudin management in the cardiovascular area.
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15 Bivalirudin is a synthetic polypeptide that binds to an active site of thrombin, blocking it; it
16 has a short half-life (20-25 minutes) and only 20% of it is renally excreted.

17
18 This drug is currently indicated for the management of patients suffering acute coronary
19 syndromes undergoing coronary angioplasty and for patients undergoing elective
20 angioplasty. It is also indicated for patients with (or at risk for) heparin induced
21 thrombocytopenia undergoing PCI (U.S.A.).
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29 Regarding drug monitoring, the authors state that the aPTT monitoring is currently
30 adopted; however, they state, this test is not ideal due to inaccuracy at high drug dosages.
31
32 The authors conclude that a more precise evaluation of the anticoagulant effect of
33 bivalirudin could be achieved with complex laboratory tests, such as the chromogenic anti-
34 factor IIa assay, or the Ecarin Clotting Time.
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40 In the catheterization laboratory, unlike unfractionated heparin which needs frequent
41 monitoring of activity and is usually given with multiple intravenous boluses, bivalirudin is
42 given with a bolus dose of 0.75 mg/kg followed by an infusion of 1.75 mg/kg/h for the
43 duration of the procedure and possibly with a further infusion of 0.25 mg/Kg/h for 4 hours
44 following the angioplasty (the prolonged infusion after PCI has been approved in Europe
45 and has shown to reduce the risk and extent of peri-procedural myocardial infarction) [2].
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2 Otherwise, the USA/FDA approved package insert also says that “Continuation of the
3 Angiomax infusion following PCI for up to 4 hours post-procedure
4 is optional, at the discretion of the treating physician. After 4 hours, an additional IV
5 infusion of Angiomax may be initiated at a rate of 0.2 mg/kg/h for up to 20 hours, if
6 needed.” That’s all. No further monitoring is needed with this drug, because if its activity
7
8 on laboratory monitoring (e.g., the aPTT or the Activated Clotting Time) is unpredictable,
9
10 its biological and clinical activity is reliable. In fact, bivalirudin has been shown to exert an
11
12 antithrombotic efficacy comparable to that of heparin with or without glycoprotein IIb/IIIa
13
14 inhibitors, warranting fewer bleedings [3, 4].

15
16 In case of hemorrhages the infusion should be interrupted because an antidote is not
17
18 available and its half life is short. Bivalirudin is hemodialyzable. Activated Clotting Time
19
20 monitoring is --preferable only in patients with renal impairment, where bivalirudin’s half life
21
22 is prolonged. In case of severe renal impairment (hemodialysis or creatinine clearance <30
23
24 ml/min) it is contraindicated (Europe).

25
26 Therefore, in my opinion, the highly predictable biological effect and the safety of this drug
27
28 render its monitoring unnecessary (and too expensive), at least in the vast majority of
29
30 patients undergoing coronary angioplasty.

31 32 33 34 35 36 37 38 39 40 REFERENCES

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43 Hematol 2010;85:185-187.
- 44
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46 versus intraprocedural in preventing myocardial damage after percutaneous
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2 [coronary intervention in patients with angina pectoris. Am J Cardiol](#)
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