Bone marrow biopsy in thrombocytopenic or anticoagulated patients

Bone marrow aspiration and trephine biopsy are performed in an estimated 10 000 patients each year in the UK (Bain, 2004). A recent postal survey of members of the British Society for Haematology suggested that these procedures are generally safe, with adverse events being reported in only one per 1000 procedures (Bain, 2003, 2004). However, while complications

are rare, they may be serious, and fatal outcomes have been reported (Le Dieu *et al*, 2003; Morley & Makris, 2003; Bain, 2004). The most frequently reported serious adverse event is bleeding. Patients with thrombocytopenia or receiving anticoagulant therapy with heparin or warfarin are likely to be at increased risk of bleeding following bone marrow biopsy but the optimal management of these patients at the time of the procedure is uncertain.

Following the recent death of an Australian patient, who experienced a massive retroperitoneal haemorrhage after bone marrow aspirate and trephine biopsy was performed during warfarin therapy with an International Normalised Ratio (INR) of 1.9, an email survey was conducted of members of the Australasian Society of Thrombosis and Haemostasis and the Hematology Society of Australia and New Zealand, to document current approaches to performing bone marrow biopsy among thrombocytopenic or anticoagulated patients. Recipients of the survey were also asked whether written informed consent was routinely obtained prior to bone marrow biopsy.

A total of 104 of more than 400 persons on the Societies' mailing lists responded to the survey. Most responses were from Australian or New Zealand haematologists but replies were also received from Cambodia, Singapore and the UK.

The results are summarised in Table I. Most respondents indicated that they did not routinely transfuse platelets prior to bone marrow biopsy in thrombocytopenic patients. Approximately 20% stopped or reversed warfarin prior to biopsy, 10% performed a biopsy irrespective of the INR, and the remainder performed a biopsy as long as the INR was 'acceptable'. Approximately two of three respondents routinely obtained written informed consent prior to bone marrow biopsy.

This survey demonstrated a broad range of practices among haematologists who perform bone marrow biopsy in thrombocytopenic or anticoagulated patients. The widespread practice of performing a biopsy without platelet support or during warfarin therapy suggests that most haematologists do not consider thrombocytopenia or anticoagulation to be important risk factors for bleeding following bone marrow biopsy.

Our survey has several limitations. First, those members of the Australasian Society of Thrombosis and Haemostasis and the Hematology Society of Australia and New Zealand who have previously experienced complications of bone marrow biopsy may have been less likely to respond to our survey. Secondly, haematologists may avoid performing a bone marrow examination or trephine biopsy in thrombocytopenic or anticoagulated patients. This information was not captured in the survey.

Preventing adverse events after bone marrow biopsy is important for individual patients as well as public health. Extrapolating the UK data, it is likely that hundreds of thousands of bone marrow biopsies are performed worldwide each year. Assuming a complication rate of 0.1% (probably an underestimate because adverse events are often underreported), hundreds of adverse events occur worldwide each year. Accurate data on the incidence of complications following bone marrow biopsy in thrombocytopenia and anticoagulated patients are required so that appropriate management guidelines can be developed.

Table I. Results of bone marrow biopsy survey.

	Number (*n/N*)	% (95% CI)
Written informed consent prior to biopsy		
Routinely obtained	66/104	64 (53–73)
Not routinely obtained	38/104	36 (27–47)
Biopsy in thrombocytopenic patients		
Do not transfuse platelets	50/104	48 (38–58)
Transfuse platelets in selected cases	51/104	49 (39–59)
Transfuse platelets routinely	3/104	3 (0–8)
Biopsy in anticoagulated patients		
Stop warfarin or reverse anticoagulation	18/102*	18 (11–26)
Biopsy if INR <2.0	18/102*	18 (11–26)
Biopsy if INR not above therapeutic range	52/102*	51 (41–62)
Biopsy irrespective of the INR	14/102*	13 (8–22)

*Not reported by two respondents.

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