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Screening for an underlying myeloproliferative neoplasm in patients with thrombocytosis post-induction chemotherapy for acute myeloid leukemia

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Rebound thrombocytosis after induction chemotherapy occurs in up to 40% of patients with acute myeloid leukemia (AML) and may be associated with a favourable outcome [1]. Despite being a recognised cause of secondary thrombocytosis, this rebound phenomenon remains a trigger for the investigation of the myeloproliferative neoplasm (MPN)-associated, driver mutations of *JAK2* V617F, *CALR* exon 9 and *MPL* exon 10 to determine whether the AML had transformed from an underlying MPN in whom the clinical management remains challenging [2].

A retrospective audit was therefore performed in order to address the clinical value of screening for the mutations in patients presenting with a thrombocytosis ($> 450 \times 10^9$/l) post AML induction treatment. From January 2006 to May 2020 inclusive, requests received for *JAK2* V617F, *CALR* exon 9 and *MPL* exon 10 mutation analyses were reviewed at a molecular diagnostic centre for hematological malignancies that receives approximately 1500 *JAK2* V617F requests per annum. Clinical details of post-induction (i.e. post-cycle one) thrombocytosis were identified on 33 requests. MPN-associated mutation detection methodology was unchanged throughout the audit period. The *JAK2* V617F was not detected in any of the 33 patients. *CALR* exon 9 mutations were sought in 23/33 and not detected with *MPL* exon 10 mutations analysed in 16 *JAK2* V617F-/*CALR*- patients and again, were not detected.

While the impact on laboratory resources appears minimal, this brief survey suggests that molecular testing for MPN-associated mutations is not routinely warranted in AML patients with thrombocytosis post-induction chemotherapy. While sporadic cases of rebound thrombocytosis unmasking an MPN do exist [3, 4], a recent review comparing *de novo JAK2* V617F-positive AML with *JAK2* V617F-positive AML transformed from an underlying MPN revealed distinctive, clinical, hematological, morphological and molecular characteristics. At AML diagnosis, cases of AML transformed from an MPN were significantly more likely to have splenomegaly, MPN-like megakaryocytes (large, hyperlobated or stag horn nuclei, bulbous nuclei, clustering) and a complex karyotype. After recovery from induction chemotherapy, none of the *de novo JAK2* V617F-positive AML patients had bone marrow evidence of an underlying MPN such as typical megakaryocyte morphology and clustering or reticulin fibrosis: features evident in the majority of patients in whom the AML had transformed from an MPN [5]. It is therefore suggested to pay considerable attention to the aforementioned clinical, biological and morphological aspects in AML patients with rebound thrombocytosis post-induction therapy prior to evaluation of MPN-associated mutations.

1. Compliance with ethical standards

1.1. Ethical approval

This study encompassed standard of care, routine, investigation and was performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Declaration of Competing Interests

The author declares no conflicts of interest.

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