

Morbidity and mortality associated with performing bone marrow aspiration and biopsy

Abstract

Background: Bone marrow aspiration and biopsy are diagnostic methods in the study of hematological diseases. Complications are rare. Knowing the morbidity and mortality related to the procedure is essential in order to implement preventive behaviors and improvement plans.

Objective: To determine the incidence of complications in patients over 18 years who were undergone to bone marrow biopsy and aspiration in a university hospital between October 2013 and May of 2015. Furthermore, frequency, socio-demographic and clinical characteristics were established as well.

Materials & methods: Observational, descriptive and retrospective study. The unit of analysis was biopsies and bone marrow aspirations. The information was obtained from the database of outpatient hematology ward, into the program Group of Education and Monitoring of Egress (GESE) of the Hematology Service of Hospital de San José (Bogotá, Colombia), and from medical records.

Results: A total of 1252 bone marrow aspirates and biopsies were performed on 914 patients. Seventy-seven complications were reported, which corresponds to 6.15% of all documented procedures. The most frequent complication was: pain (100%), being more affected the women (66%), OR 1,91 (IC 1,18-3,11) $p=0,003$. Regard to pathology diagnosis, 53.2% of biopsies were histologically normal hematopoiesis, followed by 16.8% for chronic myeloproliferative syndromes, which was the diagnosis most commonly associated with bleeding events (40%):OR 8,9 (IC 1,2-66,44) $p=0,006$, and death (1.3%).

Conclusion: Pain was the most frequently reported complication, and among bleeding complications, chronic myeloproliferative disorders were the most common diagnosis. The largest number of complications in women may be related to the anatomical differences between the genders. It is recommended to improve post-procedure analgesia and prospective studies to establish association between complications and diagnosis.

Keywords: complications, bone marrow biopsy, bone marrow aspirate, morbidity, mortality

Volume 3 Issue 1 - 2018

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Received: December 29, 2017 | **Published:** February 06, 2018

Introduction

Aspirate and bone marrow biopsy are diagnostic methods used in the study of hematological diseases allowing molecular, cytogenetic, and immunophenotype analyses, indispensable today for the classification of hematolymphoid malignancies. Its indications are ample and include various types of hematolymphoid malignancies, solid tumors, study of fever of unknown origin, and other infiltrative diseases. Trained physicians must perform these procedures in order to recognize indications and medical risks related with the procedure and also managing potential complications.¹ This study can be realized on an outpatient procedure room or during hospitalization. For patient convenience, biopsies are usually made in the posterior iliac crest.²

Nevertheless, pain is a common outcome after this kind of procedures. In the UK the use of local anesthetic and benzodiazepines (midazolam), as a pain management strategy is common during this process, achieving better grief control.^{3,4} Furthermore, other strategies for deep sedation are also used, such as ketamine or propofol, these being more morbid by a high risk of respiratory depression, aspiration, hemodynamic instability, arrhythmias, and cardiac arrest.⁵

While there are several factors that are associated with the onset of pain as gender, race, body mass index and duration of the procedure, it is clear that anxiety plays an important role related to pain control after the procedure. Therefore, giving prior information, solve hesitations adequately and reassure the patient is used as a non-pharmacological pain control strategy.⁶

In the Hospital of San José (Bogotá, Colombia) as part of the quality management of the institution, there is a monitoring program after invasive procedures called Group of Education and Monitoring of Egress (GESE). This program offers comprehensive, emotional orientation, safe, continuous, and quality care, ensuring adherence to the home care plan. The scope includes patients who have undergone surgery in all specialties of the hospital, in our specific patients whose were undergone bone marrow biopsy and aspiration.⁷

Several case reports of complications related to the realization of bone marrow aspiration and biopsy had been published, it is worth highlighting studies such as the ones performed by Barbara J. Bain in collaboration with the British Society of Hematology, which analyze morbidity and mortality in terms of frequency and causal relationship