



Research Article

ANTIBIOTHERAPY OF FEBRILE NEUTROPENIA AMONG PATIENTS WITH CANCER ADMITTED AT THE INTENSIVE CARE UNIT: A RETROSPECTIVE STUDY

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ABSTRACT

Febrile neutropenia (FN) is a medical emergency requiring immediate evaluation and administration of empiric broad-spectrum antibiotics. In cancer patients, it's a major cause of morbidity, mortality, and overcost. Our retrospective study over a period of 1 year described epidemiology, bacteriology, antibiotherapy and prognostic of FN in cancer patients admitted at intensive care unit (ICU) of Rabat Oncology National Institute (Morocco). We first ranked FN among all reasons of hospitalization at ICU, then we described epidemiology, management and prognosis. Over the studied period, 520 patients were admitted at ICU (74% for surgical reasons and 26% for medical ones). FN represents 34% among all reasons for hospitalization at ICU. Antibiotherapy was empiric in 70% of patients. For the first-line, it was based on ceftazidim or imipenem-cilastin. For the second-line, ceftazidim or imipenem were associated to amikacin or gentamicin. For documented antibiotherapy, targeted germs were *Staphylococcus spp*(37,5%), *E.coli*(25%), *Streptococcus spp* (16,7%), *P.aeroginusa* (8,3%), *A.baumannii*(8,3%) and *K.pneumonia* (4,2%).

Death was observed in 20% of FN patients, which represents 19% of total death at ICU over the study period. To sum up, FN is a common, resource-intensive and clinically important complication of cancer treatment. Despite an antibiotic therapy started in all our patients with FN, evolution remains fatal for 20% of patients.

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INTRODUCTION

Febrile neutropenia is considered as a medical emergency requiring immediate evaluation and administration of empiric broad-spectrum antibiotics (Scott, Stephens, 2019). In patients with cancer, it presents a major cause of morbidity, mortality, and overcost. In this context, our study aimed to describe the epidemiology, bacteriology, antibiotherapy and prognostic of febrile neutropenia in patients with cancer admitted at the intensive care unit of Rabat Oncology National Institute (Morocco).

MATERIALS AND METHODS

In this retrospective study conducted over a period of one year, over which we first ranked febrile neutropenia among all reasons of hospitalization at the intensive care unit of our hospital, then we described the different characteristics of its epidemiology, management and prognosis.

RESULTS

520 patients were admitted at the intensive care unit during the study period, 74% for surgical reasons and 26% for medical ones.

Febrile neutropenia represents 34% among all medical reasons for hospitalization at the intensive care unit (177 patients). It was also at the origin of 21,4% of total hospitalization days (Fig 1).

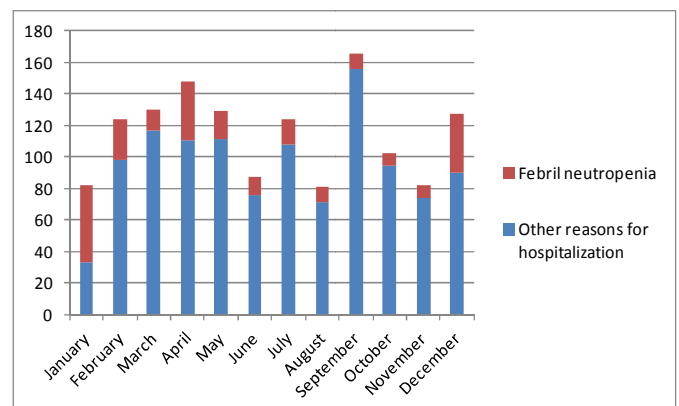


Fig 1 Days of hospitalization at the intensive care unit

Sex ratio M/F for febrile neutropenia patients is 0,92.

Febrile neutropenia antibiotherapy was empiric in 70% of patients. For the first-line, it was based on ceftazidim or

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imipenem-cilastin, as piperacillin-tazobactam and cefepime were out of stock at our hospital. For the second-line, ceftazidim or imipenem were associated to amikacin or gentamicin.

For the 14 febrile neutropenia patients who received a documented antibiotherapy with an identification of involved bacterial species, the nature of sampling is detailed in Fig 2.

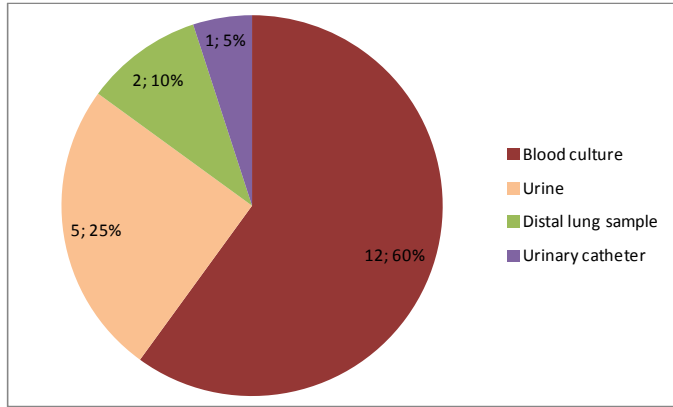


Fig 2 Nature of sampling

The most frequent targeted germs were *Staphylococcus spp* (37,5%), *Escherichia coli* (25%) and *Streptococcus spp* (16,7%) (Fig 3).

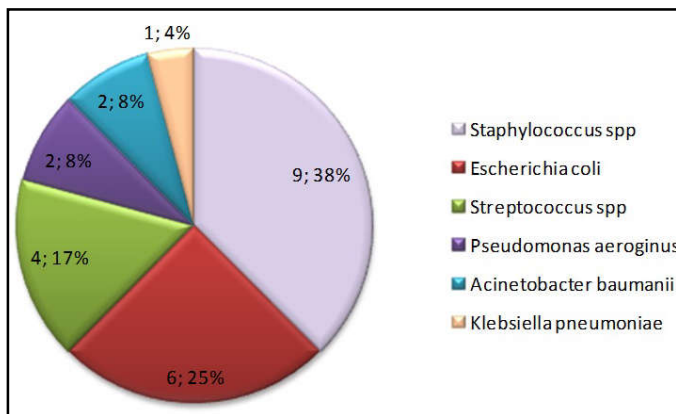


Fig 3 Identified bacterial species

The evolution to death was observed in 20% of febrile neutropenia patients, which represents 19% of total death at the intensive care unit during the study period.

DISCUSSION

The intensive care unit is a hot work service at Rabat Oncology National Institute. Hospitalization of most of patients is successive to an act of Surgical Oncology. Febrile neutropenia is one of the most common medical reasons for admission to intensive care and is the source of a large share of hospitalization days in the intensive care unit. Fever in neutropenic patients is defined by an oral temperature more than 38.0°C or an absolute neutrophil count less than 500 neutrophils/ μ L (Hosiriluck and Radhi, 2015; Kochanek, 2019). Antibiotic treatment of febrile neutropenia should obey the emergency deadlines (Scott, Stephens, 2019). It justifies the empirical treatment in most cases, provided that the prescription is conducted according to international recommendations. This is the case in Rabat Oncology National Institute where febrile neutropenia first-line antibiotherapy is based on the use of ceftazidim or imipenem-cilastin, as piperacillin-tazobactam and cefepime were out of stock at our

hospital during the study period. For the second-line, ceftazidim or imipenem were associated to amikacin or gentamicin. This concurs with therapeutic protocols used in similar studies, except Levofloxacin and aztreonam which are used in other hospitals but not at ours (Markcourtney *et al.*, 2007).

However, it is desirable to perform, as far as possible, bacteriological samples before starting an antibiotherapy, in order to adapt the treatment, case by case. Indeed, the empirical treatment must be reconsidered in case of no improvement after 5 to 7 days, in which case it is absolutely necessary to document the prescription (Hosiriluck and Radhi, 2015). This was the case for only 14 patients among the 177 admitted for febrile neutropenia, corresponding to a percentage of 7,9%. This latter is low compared to similar studies that report documented Bacteremia in 25% of neutropenic fever (Scott, Stephens, 2019). Our documented cases benefited, for the majority, from blood cultures, and in which the isolated germs belonged mostly to staphylococcal and streptococcal species, as well as *Escherichia coli* genus. Similar studies reports that most infections are due to gram-positive organisms (Scott, Stephens, 2019). These pathogens are often responsible of opportunistic infections in immunodepressed patients, and the evolution remains fatal in some cases despite the establishment of an adequate treatment, due to comorbidities found in these patients, which further complicates their management. Moreover, similar studies also report the association of febrile neutropenia with an elevated risk of mortality, which was the case for 20% of our study patients (Aagaard *et al.*, 2020).

CONCLUSION

Febrile neutropenia is a common, resource-intensive and clinically important complication of cancer treatment. Despite an antibiotic therapy started in all our patients with febrile neutropenia, evolution remains fatal for 20% of patients.

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