Multiple Myeloma Secondary to HIV Infection, Revealed by Renal Failure: About a Case

Mbengue Mansour¹, Cissé Mouhamadou Moustapha¹, Faye Maria², Lemrabott Tall Ahmed², Fall Khodia², Keita Alex², Faye Moustapha², Ba Bakary², Diagne Seynabou², Keita Niakhaleen², Ba Mamadou Aw², Dieng Ameth², Niang Abdou², Ka El Hadji Fary², Diouf Boucar²

¹Department of Nephrology, Regional Hospital, Thies, Senegal
²Department of Nephrology, Aristide Le Dantec University Hospital, Dakar, Senegal

Email: mansourmbengue92@gmail.com

Abstract
Multiple myeloma is on the list of neoplasia that may be associated with human immunodeficiency virus infection. It is an affection that aggravates the prognosis in these particular patients. We present the case of a patient with multiple myeloma and HIV infection, revealed by renal failure. This was a 59-year-old patient who was received to the Department of nephrology for renal failure associated with severe aregenerative pancytopenia. In etiological investigations, multiple myeloma Secondary to HIV Infection, Revealed by Renal Failure: About a Case. Open Journal of Nephrology, 9, 20-25. https://doi.org/10.4236/ojneph.2019.91002

1. Introduction

Multiple myeloma (MM) is included in the list of neoplasia that may be associated with human immunodeficiency virus (HIV) infection [1] [2]. It is an affection that aggravates the prognosis in these particular patients. In this article, we present the case of a patient with multiple myeloma and HIV infection, revealed by renal failure. We then propose an updated review of the mechanisms that may explain the link between HIV infection and MM, as well as the particular clinical manifestations and therapeutic implications of this association.

2. Case Report

Mr N.D, a 59 years old senegalese patient, with no particular pathological ante-
cedent with a notion of taking herbal medicine. He was admitted on 03/10/2018
in the nephrology department of the regional hospital of Thies for renal failure
in a context of deterioration of the general state (DGS). Upon admission, the in-
terrogation found nausea accompanied by vomiting evolving for 2 months. The
general examination found a DGS with weight loss and physical asthenia. Ar-
terial pressure was 129/82 mmHg and diuresis was 1700 cc/day. The physical
examination found a silky trichopathy. The rest of the clinical examination was
normal. At the paraclinical explorations, the hemogram showed aregenerative
pancytopenia with anemia at 8.7 g/dl, thrombocytopenia at 37,000/mm³, leuco-
penia at 1800/mm³ and a reticulocyte count at 1.9%. The medullogram showed a
plasmocyte infiltration at 20% (Figure 1). The serum creatinine was 375 mg/l
and blood urea was 2.2 g/l. The serum calcium was 91 mg/l and the phosphate-
emia was 117 mg/l. Serum proteins electrophoresis found polyclonal hypergam-
maglobulinaemia, hypoalbuminemia at 18 g/l and hypoproteinemia at 57 g/l.
The proteinuria was 0.45 g/24 h. The account of Addis found a leukocyuria at
110,000/mn without hematuria. The X-ray of the skull showed no geode. The
renal biopsy puncture was not performed because of severe thrombocytopenia.
The HIV serology was positive for HIV1. The viral load of HIV1 was 7152 cop-
ies/ml. The diagnosis of multiple myeloma associated with HIV was retained.
Hemodialysis was performed in our patient every 48 hours. The evolution was
unfavorable, marked by the death of the patient caused by digestive haemorr-
hage, two weeks after admission, before the start of antiretroviral treatment and
chemotherapy.

3. Discussion

The association of multiple myeloma and HIV infection gives rise to three ref-
lections. The first is to see if HIV infection is a contributing factor to multiple
myeloma. It is also to highlight the specific clinical and paraclinical manifesta-
tions of this association, finally to see the implications for this different thera-
peutic modalities in this association.

The exact mechanisms of plasma cell disorders in HIV patients are unclear.
Two main mechanisms probably contribute to the development of plasma cell
disorders in this population of patients: antigenic stimulation and immunodefi-
iciency [3].

It is generally accepted that chronic antigenic stimulation is important step in
the process. Indeed, HIV antigens and/or other bacterial or viral antigens can act
as super-antigens [4] [5] [6] [7] [8] and stimulate B-cell proliferation and im-
munoglobulin secretion without the help of T cells. However, very little is
known about the nature of the antigen(s) and the published data has been con-
troversial. It was stipulated that a viral infection or HIV, Epstein-Barr virus,
human herpes virus 8, herpes simplex virus and hepatitis B and C viruses antigi-
ens could play an important role in the development of B cells [8].

HIV viruses can cause T-cell dysfunction and dysfunctional T cells can induce
B cell activation without the need for antigenic stimulation [8]. In addition, HIV
infection depletes T cells, resulting in profound immune deficiency. Grulich et al. recently conducted a meta-analysis to study the role of immunodeficiency in the development of MM. The authors compared the incidence of cancers, including MM, in HIV/AIDS patients and kidney transplant patients on immunosuppressive drugs [9]. The authors found that the standardized incidence ratio (SIR) of MM in HIV-infected patients was 2.71, which was quite similar to that of MM in renal transplant patients (SIR: 3.12). These data suggest that T-cell depletion and immune deficiency may act an important role in increasing the incidence of MM in HIV patients.

Several epidemiological studies conducted in the United States, Italy and Australia have shown a 2- to 5-fold increase in the risk of developing MM in HIV-infected patients [10]. In this patient population, MM has particular characteristics. In the general population, MM is a disease that mainly affects the older patients: the median age of diagnosis is 66 years and only 2% of patients are under 40 years of age [11] [12]. However, in HIV-infected patients, MM appears much earlier: the mean age of patients varying in the quarantine [12]. In our patient, MM was diagnosed at 59 years old. In fact, the age of onset of MM in these patients depends on that of HIV infection. MM in HIV-infected patients shows atypical clinical evolution. It tends to be associated with solitary bone plasmocytoma or extramedullary plasmacytoma [13]. These patients also tend to have a low level of M protein despite the aggressiveness of the disease. The progression of MM in HIV-infected patients is very rapid and overall survival is short. MM in HIV-infected patients has atypical histopathological characteristics, and some patients may have anaplastic cells. These anaplastic cells are negative for the common leukocyte antigen, lysozyme, and cytoplasmic immunoglo-

Figure 1. Medullogram showing plasmocyte proliferation.
The interval between HIV infection and the diagnosis of MM remains to be determined. In some reported cases, MM was the first manifestation of HIV/AIDS infection. In our patient, the diagnosis of MM and that of HIV infection were concomitant. It appears that MM occurs at different stages of HIV infection: some patients develop MM at the beginning of the infection, while others develop it several decades later.

Highly active antiretroviral therapy (HAART) treatment acts an important role in the management of plasma cell disorders in patients with HIV infection. Limited data suggests that a good response to HAART may lead to a reduction in M protein in some HIV-infected patients with monoclonal gammopathy. Amara et al. reported that HAART could achieve complete remission of multiple myeloma. The exact effect of antiretroviral therapy on myeloma is poorly documented, contrary to the implication of these therapeutics in the regression of certain tumoral pathologies such as Kaposi’s sarcoma and certain types of non-Hodgkin’s malignant lymphoma, which is a phenomenon already well described. It is also not known how long patients need to take antiretroviral therapy before the start of chemotherapy.

It was recently reported that protease inhibitors such as ritonavir, saquinavir and nelfinavir (but not indinavir) induce growth cell arrest and apoptosis in several MM cell lines. These protease inhibitors down-regulate the antiapoptotic protein Mcl-1, block interleukin-6-stimulated phosphorylation of STAT3, and inhibit production of vascular endothelial growth factor. Nelfinavir has synergistic effects with bortezomib on the proteotoxic death of MM cells. The chemotherapy regimens for MM in HIV-infected patients are the same as for seronegative HIV-infected MM and usually consist of 2 to 3 drug combinations including thalidomide, lenalidomide, bortezomib, and dexamethasone.

4. Conclusion

The development of MM during HIV infection implicates various molecular mechanisms and pathways, and the understanding of these pathways has important implications in the treatment of MM in general. Antiretrovirals undoubtedly have other targets than viral enzymes. The discovery of these pathways offers new perspectives especially in the MM.

Ethical Statement

The informed consent of the patient’s family was obtained.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.
References


