Biology of a Covid 19 Patient in Post-Induction for Acute Myelomonocytic Leukemia at Brazzaville University Hospital

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Abstract: *The new SARS-CoV-2 infection more commonly known as covid 19 is a viral infection with a predominantly respiratory tropism. The documentation of covid 19 infection in the field of haemopathic malignancie deserves to be further enriched at this early stage of the pandemic. We report here the biological parameters of a case of covid 19 infection in a AML4 patient post induction of chemotherapy.*

Keywords: *Covid 19, acute myelomonocytic leukemia, Chemotherapy, Brazzaville*

1. INTRODUCTION

The new SARS-CoV-2 infection more commonly known as covid 19 is a viral infection. The first cases were reported in China, in the city of Wuhan on December 31st, 2019. It is a new tropical disease, mainly respiratory. Its evolution is very often silent in the young population.

In the elderly, immunocompromised or with co-morbidities, the viral infection is potentially serious, manifesting itself as a severe acute respiratory syndrome that may progress to multi-visceral failure.

Covid 19 infection in a cancer patient is an uncommon situation in the early stages of a pandemic. It is therefore useful to document these cases in order to provide data that could contribute to a better understanding of this new disease. It is in this perspective that we proposed to report the biological parameters of a patient suffering from acute myelomonocytic leukemia (AML 4 FAB classification) in whom the diagnosis of a covid 19 infection was made during induction.

AML 4 is a form of acute myeloblastic leukemia (AML) resulting from bone marrow and monoclonal proliferation of myeloblasts and monocytes.

2. PRESENTATION OF THE CASE

We report the case of a 21 year old young man, without any particular findings in his past history, who was admitted to the Clinical Hematology Department of Brazzaville University Hospital on March 13th, 2020 for a long term fever and submandibular swellings. The clinical examination on entry revealed an infectious syndrome with no localization found, and polyadenopathies. The haemogram performed on the Sysmex XN 350 auto-analyzer showed bicytopenia (Haemoglobin 7 g/dL, platelets at 37 Giga/L) associated with hyperleukocytosis at 201 Giga/L. The myelogram diagnosis was a type III rich marrow with a blast population of myeloblasts and monoblasts 31.6% and 37.9% respectively. The diagnosis of AML 4 was therefore made. This patient received two induction courses of chemotherapy during 30 days apart (Aracytine-Daunorubicin protocol) which resulted in Grade IV hematological toxicity.

The post-chemotherapy period was marked by the occurrence of two episodes of care-associated infections. The first episode occurred on the 13th day of the first chemotherapy course and manifested itself by fever and cellulitis, the starting point was an infection of the peripheral catheter. Resolution of the inflammatory and

infectious signs was achieved by removal of the peripheral venous tract, local care and parenteral biantibiotic therapy: oxacillin and ceftriaxone. The second infection occurred on the 17th day of the second chemotherapy course, manifesting itself as a progressive ascending fever, then in isolated plateau without any signs of clinical localization; resistant to the different lines of treatment: antibiotic and antifungal treatment. Faced with deep neutropenia, we initiated three days of growth factors (G-CSF) in order to limit the risk of sepsis. Thanks to the progressive increase in the number of neutrophils, signs of clinical localization of the infection appeared in the form of subcrackle sounds of the left lung field. We concluded to a non-dyspneic pneumopathy. A chest X-ray carried out highlighted this, leading to the suspicion of a Sras-Cov-2 infection. The PCR was positive, confirming the diagnosis of Sras-Cov-2 pneumopathy.

The patient was transferred to a Covid 19 unit. Triple therapy associating Hydroxychloroquine, Azythromicine and Lopinavir/Ritonavir was initiated. The evolution was characterized by the disappearance of fever, respiratory signs and negativation of the PCR control on the 21st day of hospitalization after 14 days of treatment.

Table1. *Patient's Haemogram at Diagnosis and Negativation of covid 19 PCR*

Parameters	To the diagnosis of Covid-19	To the negativation of Covid-19 PCR	Unit
Leukocytes	4,03	6,06	G/L
Hémoglobin	7,7	10,6	g/dL
Hématocrit	23	33,7	%
Mean globular volume	76,9	88,7	fl
Mean hemoglobulin content	25,8	27,9	Pg
Platelet	33	348	G/L
Neutrophilic polynuclear	2,48 (61,6 %)	3,36 (55,3 %)	G/L
Eosinophilic polynuclear	-	0,04 (0,07 %)	G/L
Basophilic polynuclear	0,02 (0,5 %)	0,01 (0,02 %)	G/L
Lymphocytes	0,96 (23,8 %)	2,15 (35,5 %)	G/L
Monocytes	0,57 (14,1 %)	0,50 (8,3 %)	G/L
Reticulocytes	26 (0,87 %)	-	G/L

Table2. *Patient's Haemogram at Diagnosis and Negativation of covid 19 PCR*

Parameters	To the diagnosis of Covid-19	Unit
Creatinine	104	µmol/L
Urea	6,6	µmol/L
Uric acide	1,2	mg/dL
ASAT	42	UI/L
ALAT	57	UI/L
LDH	355	UI/L
γGT	45	UI/L
Direct bilurubine	6,6	µmol/L
Total bilurubine	20,4	µmol/L
CRP	36,1	mg/L
Protidemia	52,7	g/L
Ferritinemia	891	µg/L
Triglyceride	1,86	mmol/L
Total Cholesterol	2,54	mmol/L
HDL Cholesterol	0,44	mmol/L
LDL Cholesterol	0,95	mmol/L
Total IgA	2,83	g/L
Total IgM	2,89	g/L
Total IgG	19,71	g/L

3. DISCUSSION

Fever is a protective response against infections in general and It is an important criterion in the diagnosis of covid-19 [1]. Thus, a high temperature allows the screening of potentially covid-positive patients in an outpatient setting. The single selection criterion of increased body temperature would be of little value in the hospital setting. Fever is encountered indeed in the most infectious diseases and it is one of the main reason for emergency room visits. As a result, its referral value could be further enhanced in the hospital setting if it is associated with other symptoms, particularly those of respiratory failure. This is the observation made by many authors who report that the symptomatology in covid-positive patients is dominated by fever followed by cough [2-4]. The rarity of respiratory signs in immunocompromised patients such as in our case may have contributed to delay the diagnosis of pneumopathy and expose the health care staff to potential covid contamination [19]. Covid 19 cases are managed in specialized units, indeed, with adequate protective measures to limit the risk of contamination.

Many authors report in that immunosuppression, particularly connecting with cancer and with or without chemotherapy, is a risk factor for a

lethal covid evolution 19 [5]. This led some practitioners to reduce immunosuppressive treatment in the management of some diseases [6,7], (as viral clearance may be impeded in such cases) and to reduce the time of hospitalization. Conversely, other authors have hypothesized that hyperactive immune responses may trigger a cytokine storm associated with clinical deterioration [8], which led to interest in certain immunosuppressive drugs as a potential treatment for covid 19. In addition, although covid 19 positive patients are at high risk for worsening disease, covid 19 has not been shown to cause more severe disease in immunocompromised patients. In our case, the patient, initially neutropenic post-induction, benefited of the growth factors. These would be at the origin of the rise in the number of neutrophils, induced the production of inflammatory cytokines responsible of the appearance of respiratory signs that led to the suspicion of pneumopathy. In front of this observation, one has the right to wonder whether the deep neutropenia observed during induction would have contributed to the paucity of respiratory signs due to the lack of production of cytokines that actively contribute to cytokine runaway. Furthermore, the patient's favorable outcome could also be attributable to the benefit of G-CSF.

Lymphopenia has also been reported, sometimes with an increased ratio of neutrophils to lymphocytes [10-12]. This trend is more often marked by a reversal of the white blood cell count in cases of hematological malignancies. The increase in ferritinemia is thought to be the consequence of transfusions of erythrocyte concentrates received by the patient during the previous hospital stay.

4. CONCLUSION

The management of covid 19 remains an up-to-date challenge for the global scientific community. This disease, associated with a haemopathic malignancy, makes the management of covid 19 more complex and requires a special attention from clinicians. Systematic investigation of covid 19 infection in front of persistent fever in hospital blood disorders, would improve not only patient management but also the risk of exposure of healthcare personnel to covid 19.

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