Epidemiological and Clinical Profile of COVID-19 Patients Hospitalized in University Hospitals in Mali

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| Abstract | | Original Research Article |

Introduction: The COVID-19 pandemic has caused a significant number of patients worldwide, associating mortality and sequelae. Its clinical presentation is very polymorphic and its tropism largely explains the different manifestations encountered. In order to determine the sociodemographic characteristics of patients hospitalized in the University Hospitals of Mali (CHU) for COVID-19, we conducted a study in the first year of the COVID-19 pandemic. ***Methods:*** This was a retrospective, descriptive, multicenter study over 12 months from March 2020 to February 2021 at the level of the various university hospitals in Mali, namely: Gabriel Touré University Hospital, Point-G University Hospital, Kati, Mali Hospital and Bamako Dermatology Hospital. ***Results:*** We collected 1349 patients out of 8376 cases during the period, i.e. 16.10%. Point G University Hospital accounted for 51.2% of admissions. The average age of the patients was 30 years old. The male sex was predominant with a sex ratio of 2.20. The median length of hospitalization was 8 days. The general signs were fatigue (11.6%) and asthenia (5.8%). The symptomatology was dominated by cough (23.1%), dyspnea (11.9%), headache (8.4%), anosmia (4.6%) and vomiting (2.1%). Biological abnormalities were dominated by anemia (13.9%), leucopenia (11.7%), hyperleukocytosis (4.8%), hypercreatinineemia (44.9%), hyperglycemia (9.8 %) and hypertransaminasemia (25.4%). Chest CT was performed in 10 patients, i.e. 0.7%; the most common radiological sign was multifocal ground glass opacities (100%). The evolution was favorable (88.2%), with 7.8% of cases of death. ***Conclusion:*** COVID-19 remains a polymorphic condition both in terms of symptoms, biology and imaging, further questioning the systemic nature of the disease.
Keywords: COVID-19, hospitalized patients, Mali, university hospital.

INTRODUCTION

COVID-19 (Coronavirus Disease 2019) is a viral zoonosis secondary to infection by a virus belonging to the coronaviridae family. As of December 31, 2019, 27 cases of pneumonia were already identified in Wuhan city, Hubei province in China [1]. The causative agent was identified from samples by the Chinese Center for Disease Control and Prevention (CCDC) on January 7, 2020, and later named Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) [2]. The World Health Organization (WHO) declared on 01/30/2020 the SARS-CoV-2 outbreak as a public health emergency of international concern. This emergency was declared on March 11, 2020 as a pandemic in view of its rapid spread to the majority of countries in the world [3,4].

Human-to-human transmission is high with a basic reproduction rate (R0) of between 2 and 4

meaning that an infected individual infects on average two to four other people. The preponderant mode of transmission would involve large droplets (> 5 μm) generated during speech, coughing or sneezing, and not propagating more than two meters from the emitting subject. There are strong arguments for the existence of airborne transmission, mediated by aerosols (droplet size ≤ 5 μm), but this route is marginal, as is transmission by contact with contaminated surfaces [5]. Globally, nearly 2.3 million new cases and nearly 15,000 deaths were reported between April 24 and May 21, 2023. As of May 21, 2023, more than 766 million confirmed cases and more than 6.9 million deaths have been reported worldwide. In the Western Pacific region, there are more than 203 million confirmed cases and more than 2 million deaths.

In Europe, America, Southeast Asia, there have been respectively more than 276 million, 192 million and 61 million confirmed cases with respectively more than 2 million, eight hundred thousand, and more than three hundred thousand deaths. In Africa, more than 9,530,200 confirmed cases and more than 175,000 deaths have been observed [6].

Mali recorded its first cases of COVID-19 on March 25, 2020. As of May 29, 2023, there were 33,148 positive cases of COVID-19, 32,329 recoveries, i.e. a recovery rate of 97.52% and 743 deaths, i.e. a lethality of 2.24% [7]. According to the WHO, human behavior is the common denominator in epidemic risk and, ultimately, in the prevention and control of an outbreak. What people do or don't do greatly affects the control of outbreaks, and success therefore depends on the active participation and contribution of the population, including those affected or exposed. It is therefore important to understand how a community perceives and represents the disease before designing strategies intended to act on behaviors. This study focuses on COVID-19 in university hospitals in Mali, and aims to provide epidemiological and clinical data from patients hospitalized for confirmed SARS-COV 2 infection.

METHODOLOGY

This was a retrospective, descriptive and multi-centre study over 12 months from March 2020 to February 2021 in the University Hospital Centers of Mali, which are the CHU Gabriel Touré, CHU du Point-G, CHU de Kati, the Hospital of Mali and the Dermatological Hospital of Bamako (HDB). The population concerned consisted of all patients hospitalized for a confirmed SARS-CoV 2 infection. Suspected cases of Covid-19, patients with a positive diagnosis of COVID-19 confirmed by non-hospitalized RT-PCR and those with a CT image in favor of Covid-19 whose RT-PCR was negative were excluded.

The sample was exhaustive for all confirmed cases of COVID–19 hospitalized within the structures during the study period. A protocol was developed as well as survey forms used for data collection. The continuous variables were described in median and interquartile range. The categorical variables in percentage to describe the sociodemographic, clinical and biological characteristics of the population. These data were entered using Epidata version 3.1 software and analyzed using IBM SPSS version 25 software.

The conduct of this study has benefited from the authorization of the ethics committee of the University of Sciences, Techniques and Technologies of *Bamako (USTTB)*. Patient confidentiality was respected during the study.

RESULTS

In total, we collected 1349 patients out of 8376 cases recorded during the period, i.e. a prevalence of 16.10% of hospitalized patients. The median age was 30 years old. The modal class was 21-40 representing 42% of cases. In our study, the male gender (69% of cases) was predominant with a male/female sex ratio of 2.20. Arterial hypertension (14.1%) was the most frequent antecedent (Table 1). Note that 85.2% of patients were asymptomatic. Fever was present in only 5% of cases (Table 2). Fatigue or muscle weakness was observed in 11.6%, cough 23.1%, dyspnea 11.9% and chest pain 3.4% of cases. ENT symptomatology was dominated by anosmia in 4.6%, followed by runny nose in 4.1%. (Table 3).

Table 1: Distribution of patients according to history

Background	Workforce	Percentage
hypertension	190	14.1
Diabetes	141	10.5
Others	85	6.4
HIV	8	0.6
IRC	5	0.4
COPD	3	0.2
Corticosteroid therapy	2	0.1
Neoplasia	0	0
Cirrhosis	0	0
No history	913	67.7
TOTAL	1349	

Table 2: Distribution according to hemodynamic parameters

Setting	Value	Workforce	Percentage
Temperature (°C)	< 38.5	1282	95
	> 38.5	47	3.4
Heart rate (beats/min)	100	907	67.2
	100	385	28.5
Systolic blood pressure (mmHg)	90	7	0.5
	90-140	799	59.2
	140	481	35.6
Diastolic arterial BP (mmHg)	60	21	1.5
	60-90	854	63.3
	90	413	30.6
O_2 saturation (%)	94	237	17.5
	94	950	70.4

Table 3: Signs of COVID-19

Distribution of patients according to general signs		
General signs	Workforce	Percentage
Tiredness or weakness Muscular	157	11.6
Anorexia	78	5.8
Distribution of patients according to respiratory signs		
Cough	312	23.1
Dyspnea	160	11.9
Chest pain	46	3.4
Distribution of patients according to digestive signs		
Digestive signs	Workforce	Percentage
Vomiting	28	2.1
Nausea	27	2
Diarrhea	27	2
Abdominal pain	17	1.3
Distribution of patients according to neuromuscular signs		
Neuromuscular signs	Workforce	Percentage
Headache	113	8.4
Arthralgia	60	4.4
Myalgia	19	1.4
Confusion	8	0.6
Distribution of patients according to ENT signs		
ENT signs	Workforce	Percentage
Anosmia	62	4.6
Runny nose	55	4.1
Ageusia	51	3.8
Common cold	41	3
Sore throat	39	2.9
Sneeze	17	1.3

Table 4: Distribution according to patient outcome

Evolution	Effective	Percentage
Favorable	1190	88.2
Deceased	105	7.8
Exit against medical advice	14	1
Transferred to intensive care	40	3
Total	1349	100

Of 503/1349 patients who performed NFS, 13.9% had anemia, 11.7% leukopenia and 4.8% neutrophil-predominant leukocytosis. CRP (C Reactive Protein) was performed in 187 patients, i.e. 13.9%. It was high in 122 patients or 65.4%. Serum creatinine was performed in 606 patients or 44.9% and there was

an increase in creatinine levels in 118 patients or 19.47%. Blood sugar levels were taken in 607 patients, or 45%, of whom 123, or 20.27%, had hyperglycemia. Transaminasemias were performed in 596 (44.2%) finding an elevation of ALT in 123 patients (20.63%) and an increase in AST in 190 patients (31.87%).

In our series, thoracic CT was performed in 10 patients, i.e. 0.7%. The most frequent radiological sign was multifocal (100%) ground glass opacities. Hydrochloroquine or chloroquine plus azithromycin were administered in 89.1% of cases. Therapeutic abstention accounted for 10.5% of cases. Azithromycin alone was administered in 3 patients, ie 0.2% of cases. The evolution was favorable with recovery in 88.2% of cases, 3% transfer to intensive care and 7.8% death.

DISCUSSION
The prevalence of hospitalized patients over the period was 16.10% out of 8376 recorded COVID cases. The median age was 30 years old. The most represented age group was 21 to 40 years old with a percentage of 42%. In the studies of Wu [8], Guan [9] and Zhou [10] the median age was respectively 51 years, 47 years and 56 years old. The deviation from the median age could be explained by the fact that our populations are younger due to low life expectancy.

Comorbidities are possible risk factors for the severity of COVID-19. In our series, diabetes (10.5%) was the most found comorbidity followed by arterial hypertension (HTA) (14.1%). Our results are similar to those found in the literature. Zhou had found hypertension (30%), followed by diabetes (19%) as the predominant comorbidity. Similarly Wu in his study found a predominance of hypertension (19.4%) followed by diabetes (10.9%). Asthenia (11.6%) was the predominant general sign in our patients. Our results are much lower than those of Wu and Kafti [11] in whom asthenia was present in 32.3% and 80.2% respectively.

This difference could be explained by the fact that the studies of Wu and Kafti were carried out at the very beginning of the pandemic for a shorter period not reaching two months. Fever (T>38°C) was found in 3.4% in our study. Our results differ from those in the literature. This is the case in the studies by Guan, Liu [12] and Goyal [13], where fever was present in 43.8%, 81.8% and 77.1% of cases respectively. This difference could be explained by self-medication of our patients with paracetamol well before screening. In our study the frequency of respiratory symptoms was high with cough (23.1%), followed by dyspnea (11.9%). These same findings were made by Goyal with cough and dyspnea present respectively in 79.4% and 56.5%.

As for Khan [14] he observed cough and dyspnoea respectively in 59.5% and 57% and Liu cough in 48.2%. In our series, 3% of patients were transferred to intensive care and 7.8% of deaths were noted. Mekolo [15] in a similar study carried out in Douala had observed figures higher than ours with 32% of patients admitted to intensive care, and 32% of deaths. This difference could be explained by the fact that at Mekolo the study was carried out over a period of approximately 3 months (March-May 2020), and also at the start of the pandemic where we observed seriousness and mortality rates more important.

Another explanation would be that in our study the modal class was 21-40 or 42% of our patients, whereas in Mekolo it was higher 40-59 or 43.3% of patients. Similarly, 44% of patients presented at least one comorbidity dominated by hypertension (68.5) and diabetes (37.1). The involvement of comorbidities in increased mortality is well described in a review of the literature by Safer [16]. Our difficulties were the incomplete nature of certain files and the systematic non-performance of additional examinations, particularly biological examinations, which excluded a large number of files from the study.

CONCLUSION
In the first year of COVID in Mali, the care of hospitalized patients showed a polymorphism of the symptoms of this condition. Unlike other skies, the youngest were more representative in our care centers and we observed a lower mortality rate.

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