



Features of Patients With 2019 Novel Coronavirus Admitted in an Internal Medicine Department: A Descriptive Study of the First Wave of the Epidemic in Algiers

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Received: 📅 December 03, 2021

Published: 📅 December 17, 2021

Abstract

Introduction: At the end of the first wave of the Covid 19 epidemic in Algeria, very little data is known on the clinical profiles of patients, their treatment protocols and their evolution.

Aim of study: to describe the clinical and evolutionary characteristics of patients treated for SARS- CoV-2 infection (Severe Acute Respiratory Syndrome Corona Virus 2) in an internal medicine department in Algiers in response to the application of the national protocol fight against Covid 19.

Method: single-center prospective study over six-months (April 12 - September 30, 2020) including 1008 patients. The diagnosis of Covid 19 was made on clinical, radiological (thoracic CT) and / or immunological (rapid serological test and RT-PCR) criteria.

Results: We included 519 (51,5%) men and 489 (48,5%) women having an average age of $53,24 \pm 15,564$ years. Common symptoms included asthenia (59,5%), anorexia (43%) and dry cough (51%). Ageusia and anosmia affected 35% and 32% of patients respectively while only 19% of patients had dyspnea. Biological inflammatory syndrome occurred in 44% of patients, lymphopenia in 61%, thrombocytopenia in 70% and hepatic cytolysis in 21,5%. Chest CT showed minimal to moderate lesions in 80,3% of cases and severe in 6,8% of cases. We noted diabetes in 23,4% of cases, hypertension in 31% and ischemic heart disease in 3,5%. Only 25 patients had chronic inflammatory disease and 12 patients had cancer. The rapid serological test (IgM / IgG) was positive in 113 of 244 patients tested while the RT-PCR was positive in 529 of 581 patients tested. Length of hospital stay was 10 days for 25% of patients while the rest received outpatient care. Hydroxychloroquine and Azithromycin were prescribed in 62,5% and 92% of patients respectively with very few side effects (5,8%), the prescription of corticosteroids (8,3%) and cephalosporins (18,4%) was rarer. Heparin therapy was prescribed in 69% of cases, mainly for preventive purposes (61%) and the use of oxygen was only recorded in 6% of cases. The outcome was favorable in 97,5% of patients, 10 deaths was recorded and 15 transfers to an intensive care unit. Logistic regression analysis identified age >70 years (OR = 7,640; 90% CI: 1,732-33,700; p=0,007) and severe radiological lesions on the chest CT (OR = 11,406; 90% CI: 4,007-32,468; p<10⁻³) as the main determinants of serious clinical forms in our population

Conclusion: In the current context, the situation in our population seems little worrying during the first wave of the pandemic, it was well controlled by a homogeneous and well codified care

Keywords: Covid19; epidemic

Introduction

The Covid 19 pandemic is causing a huge survival crisis for mankind. As of October 1, 2021 WHO counted more than 235 million infected cases and 4 million deaths [1]. In Algeria, these figures stand at more than 205,000 confirmed cases and 5875 deaths, since the first cases recorded in February 2020 [2]. Little is known about the epidemiological data of Algerian patients. The objective of the present study was to analyze the clinical, biological and radiological profile of patients with Covid-19 during the first six months of the epidemic in Algiers.

Patients And Method

Study Design and Participants

From April 11 to September 30, 2020, we carried out a descriptive and prospective study at the El Biar Hospital in Algiers, and we enrolled 1008 patients. Only adults with a diagnosis of Covid-19 confirmed by serology test (IgM, IgG) and / or by RT-PCR (Reverse transcription polymerase chain reaction) and / or radiological signs on Chest CT compatible with the disease were included [3-6].

Clinical data

Demographic information, medical history, exposure history, comorbidities (diabetes, hypertension, respiratory diseases, ischemic heart diseases, chronic inflammatory diseases and cancers) and symptoms (asthenia, dyspnea, cough, chest pains, digestive disorders, ageusia, anosmia..) were collected by a pre-established questionnaire. Blood pressure figures were classified according to ESC 2018 [7]. Temperature, respiratory rate, heart rate and oxygen saturation were also measured. An electrocardiogram

(ECG) was performed in all patients on inclusion and then every two days in patients treated with hydroxychloroquine to detect any prolonged QT interval [8].

Laboratory testing

Medical laboratory finding results, including blood cell counts (white blood cell, lymphocyte and Platelet count), C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), liver test (Alanine Aminotransferase [ALT] and Aspartate aminotransferase [AST]), creatinine, natremia and kalemia were collected for each patient. Covid-19 IgG/IgM Rapid Test was used for the qualitative detection of IgG and IgM antibodies to Covid-19 in whole blood, serum or plasma as an aid in the diagnosis of primary and secondary infections while nasopharyngeal samples made the molecular diagnosis by highlighting the genomic material of SARS-CoV2 by real-time RT-PCR [9] at Pasteur Institute of Algiers.

Computed tomography (CT) data

The Chest CT identified images compatible with covid 19 pneumonia [10]: peripheral multifocal frosted glass opacities, parenchymal condensation or mosaic appearance. Based on the extent of lung lesions, radiological damage was classified into

minimal (<10%), mild (10- 25%), moderate (25-50%) and severe (50-70%).

Support protocol

All patients with moderate clinical expression were treated with the combination of Hydroxychloroquine (600mg/day), Azithromycin (500mg on first day then 250mg/day until the fifth day) and a preventive dose of heparin (Enoxaparin) according to the national protocol for the fight against Covid 19 [11]. For patients with a severe clinical form and requiring oxygen therapy, we prescribed broad-spectrum antibiotics, corticosteroids based on dexamethasone (8 to 16 mg / day) and curative doses of heparin (Enoxaparin 0.1ml / 10kg / 12h). A biological monitoring workup and an ECG (calculation of the QT interval) were performed on the third, seventh and tenth days of treatment.

Statistical analysis

Categorical variables were described as frequency rates and percentages and continuous variables were described using mean, median, and interquartile range. Proportions for categorical variables were compared using the χ^2 test. The tests with P value of <0.05 were considered statistically significant. All statistical analyses were performed using SPSS (Statistical Package for the Social Sciences) version 21.0 software.

Results

Demographics and clinical characteristics

Table1: Distribution of patients by sex and age groups.

Age (years)	Women		Men		Total	
	Number	%	Number	%	Number	%
< 20	5	1	5	1	10	1
20-29	34	7	22	4.3	56	5,6
30-39	69	14	74	14,4	143	14,2
40-49	89	18	106	20.6	195	19,3
50-59	138	28	112	21.6	250	24,8
60-69	80	16	119	23	199	19,7
≥70	78	16	77	15	155	15,4
Total	493	100,0	515	100,0	1008	100,0

The study involved 1008 participants, 515 (51%) men and 493 (49%) women. The mean age was 53±16 years ranging from 16 to 95 years old. 60% of patients were over 50 years old (Table 1). 75% of patients received outpatient care and the rest were hospitalized with a length of care of 10 days. The most common symptoms at onset of illness were asthenia (71,6%), anorexia (36%), dry cough (56%), headache (34%) and myalgia (33%). Anosmia and ageusia were noted in 32% and 35% of cases respectively. Less common symptoms were abdominal pain (10,3%), nausea (11,7%), and vomiting (9,6%). All clinical data are shown in Table

2. The presence of comorbidities was frequent: Hypertension (30,8%), diabetes (23,4%), ischemic heart diseases (3,5%) and respiratory diseases (5,85%). Twenty patients suffered from chronic inflammatory diseases and 12 from cancers (Table 3). We noted a contact with an infected person in 33,2% of cases while preventive measures were not respected in 77% of cases. The blood cell count showed lymphopenia (61%), thrombocytopenia (70%) and neutropenia (6%) ; other laboratory findings included elevated Erythrocyte Sedimentation Rate (ESR) (44%), high concentration of CRP (28,4%) and hepatic cytolysis (21,5%) (Table 4). The rapid serological test (IgM / IgG) was positive in 113 of the 244 patients tested while the RT-PCR was positive in 529 of the 581 patients tested (91%). Chest CT, performed in 935 patients, was normal in 57 patients (5,7%); 809 patients (86,5%) had minimal to moderate radiological lesions while the rest had severe lesions (6,8%) (Table 5). At baseline, the ECG showed a mean QT interval of 411 ± 32 ms; it was elevated (> 450ms) in 65 patients justifying the non-prescription of HCQ. The mean values were 416 ± 28ms on the fifth day and 413 ± 27ms on the tenth day of treatment.

Table 2: Prevalence of clinical symptoms.

symptoms	Number	%
asthenia	722	71,6
cough	565	56,1
ageusia	355	35,2
headache	343	34
anorexia	361	35,8
myalgia	332	32,9
anosmia	323	32
diarrhea	259	25,7
dyspnea	190	18,8
throat irritation	164	16,3
chest pain	145	14,4
nausea	118	11,7
abdominal pain	104	10,3
vomiting	97	9,6
dysphagia	22	2,2
Patients Profile		
Weight (Kg)	79,9±14,5	
SBP (mmHg)	120,2±16,9	
DBP (mmHg)	75,7±11,7	
HF (b/mn)	89±14	
RR (c/mn)	21±4	
SaO2 (%)	96,17±4,03	

SBP : systolic blood pressure , DBP :diastolic blood pressure, HR : heart rate , RR : respiratory rate.

Table 3: Prevalence of co-morbidities in order of frequency.

	Number	%
Hypertension	311	30,9
Diabetes	236	23,4
Chronic respiratory diseases	59	5,9
Dyslipidemia	36	3,6
Ischemic heart disease	35	3,5
Chronic inflammatory diseases	20	2
Chronic kidney diseases	24	2,4
Cardiac arrhythmia	23	2,3
Cancer	12	1,2

Table 4: Summary of biological abnormalities values.

Parameters	Mean Values
Hemoglobin (g/dl)	12,9±1,7
Leucocytes (103 /mm3)	7135±3366
Lymphocytes (103 /mm3)	1038±813
Platelets (103 /mm3)	250311±104168
Natremia (mmol/l)	155,5±474,2
kaliemia (mmol/l)	3,86±0,53
Creatinine	10,95±5,54
ESR (mm) (1ere h)	60±31
CRP (mg/l)	41,40±59,15
AST (u/l)	32,6±22,3
ALT (u/l)	28,0±32,9
Patients Profile	
Anemia (N %)	203 (20,2)
Neutropenia (N %)	62 (6,2)
Lymphopenia (N %)	612 (61)
Thrombocytopenia (N %)	701 (70)
Hypokaliemia (N %)	54 (5,4)
Elevated ESR (N %)	445 (44,1)
CRP increased (N %)	284(28,4)
Hepatic cytolysis (N %)	215(21,5)

ESR: Erythrocyte Sedimentation Rate; : C-Reactive Protein; LDH: lactate dehydrogenase; AST: Aspartate transaminase; ALT: Alanine transaminase.

Table 5: Radiological abnormalities on chest CT.

Extent of lesions	Number	%
No CT	73	7,2
Normal CT	57	5,7
<10%	270	26,8
10-25%	354	35,1
25-50%	185	18,4
50- 70%	56	5,6
>70%	8	0,8
Total	1008	100

We applied the national protocol to fight Covid 19 and prescribed HCQ (62.5%) and azithromycin (92%) in all moderate clinical forms. Additional antibiotics (cefotaxime 4g / day and / or ciprofloxacin 400mg / day) were prescribed in 185 patients because of bacterial superinfection. Short-term corticosteroids therapy and oxygen were reported in 8,6% and 6,2% of cases respectively. After treatment, we noted 31 cases of prolonged QT interval and 23 cases of acute hepatitis justifying the discontinuation of the combination of HCQ and Azithromycin. We also noted metabolic complications in diabetics in 6,3% of cases, thromboembolic accidents in 0,5% of cases, the onset of atrial fibrillation in 0,3% of cases and psychiatric side effects in 0,4% of cases. The outcome was favorable in almost all patients; we recorded 10 deaths and 15 transfers to intensive care. Logistic regression analysis identified age >70 years (OR = 7,640; 90% CI: 1,732-33,700; p=0,007) and severe radiological lesions on the chest CT (OR = 11,406; 90% CI: 4,007- 32,468; p<10⁻³) as the main determinants of serious clinical forms in our population Table 6.

Table 6: Determining factors of severe clinical forms from logistic regression.

		OR	95% CI	P
Age >70 years		7,640	1,732-33,700	,007
Chest CT lesions	10-25 %	,873	,281 -2,716	,815
	25-50 %	5,179	1,816- 14,770	,002
	50 -70 %	11,406	4,007-32,468	,000
	> 70 %	28,786	6,742- 122,900	,000
hypertension		,519	,196- 1,372	,186
Diabetes		,924	,385- 2,217	,860
Dyslipidemia		,213	,076- ,600	,003
Respiratory chronic diseases		,857	,228- 3,223	,819

Discussion

Clinical profiles of Covid patients can vary widely, ranging from asymptomatic infection to respiratory distress [7-9]. The clinical symptoms are dominated by general signs, ENT involvement, respiratory signs (cough and / or dyspnea) and gastrointestinal symptoms, but the semiology may be richer and different from one population to another [10,11]. Our study described the characteristics of patients infected during the first wave of the epidemic in Algiers and treated in an internal medicine department. Symptoms were dominated by general signs, cough and ENT involvement; digestive signs were infrequent and dyspnea less common. The average age of our patients was younger than that reported by Tunisian and Chinese authors. Only 60% of them were over 50 years old against 75% in Tunisia [12] and China [8,13]. Although the male predominance was clear in several published

series [11, 14- 16], probably related to a higher prevalence of cardiovascular risk factors in men, we recorded as many men as women in our population. with no age difference between the two groups. Cardio-metabolic comorbidities affected nearly half of the patients in different published series [7,17] and some authors had even reported a high mortality among these patients [18]. In our serie, this prevalence was around 30%, however, among our 10 registered deaths, we noted hypertension in 07 cases, diabetes in 05 cases and ischemic heart disease in 03 cases. 80% of our deaths were over 70 years old. Cancerous pathology's frequency was 1.2% in our patients, little different from those reported in Chinese studies [14,15]. The most frequent laboratory abnormalities in studies seem to be lymphopenia, inflammatory syndrome and hepatic cytolysis [8,19,20], these prevalences were also high in our population (61%, 44% and 21.5% respectively). RT-PCR, considered the most important element in the diagnosis of Covid 19 [21,22], was only performed in 58% of our patients, due to its unavailability during the first months of the epidemic. It was positive in 91% of cases while the rapid serological test (IgM / IgG) was helpful in 113 patients.

The diagnosis of Covid infection in our population was made mainly by chest CT (95% of cases), objectifying frosted glass opacities and parenchymal condensations [5,23]. The extension of the lesions made it possible to classify the majority of patients with a minimal or moderate form (80%), which is in line with the results published by the medical team at Rouïba hospital in Algiers (88%) [24]. The performance of CT is highly variable depending on the series with an around sensitivity of 90% and an average specificity less than 50% [25-27]. However, a normal CT scan does not rule out Covid-19 infection, especially in the first days of the disease [28], which was the case in 5.7% of our patients. The outcome under treatment was favorable in 97,5% of patients (only 10 deaths recorded) with good tolerance of HCQ (5,4% side effects). This efficacy and safety have been reported in several publications and the treatment, thus, initially recommended by several institutions [12,24, 29-31]. However, its usefulness remains disputed by the WHO as well as by certain studies and meta-analyzes [32,33] due to its ineffectiveness against severe forms and the risk of deleterious cardiac effects. A limitation of this study is the large number of missing data regarding the virological diagnosis (the onset of the epidemic in Algeria, data acquired under crisis conditions).

Conclusion

Our single-center study of 1008 patients treated during the first months of the Covid pandemic in Algiers showed that the clinical forms were mostly benign, as evidenced by the high rate of patients successfully treated on an outpatient basis (75%). The therapeutic protocol applied was well tolerated in the majority of patients with very few side effects and low mortality (1%) despite the high frequency of cardiometabolic comorbidities. Thus, the epidemiological situation does not seem very alarming during this first wave compared to that of other countries ; the analysis of the second wave data is a work in progress.

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DOI: [10.32474/ACRR.2021.03.000173](https://doi.org/10.32474/ACRR.2021.03.000173)

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