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Covid-19 related deaths:
Profile of cases treated at the Hospital Center of Oran- Algeria

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Abstract :

Objective: The objective of this work was to describe the profile of cases of death linked to severe Covid-19 infection.

Method: This is a retrospective descriptive study carried out on 144 cases of death linked to severe SARS-COV-2 infection hospitalized at El Kerma hospital – CHU Oran during a period of 4 months, from July 1 2021 to October 31, 2021 (period which corresponds to the wave of the DELTA variant).

Results: We collected 144 cases of death linked to severe SARS-COV-2 infection. More than 60% were aged over 60 years with a predominance of the male sex (80%),89% of deaths had comorbidities, the most common of which were hypertension, followed by diabetes. The triad dominated the clinical signs: asthenia (73.3%), headache (67.1%) and fever (63%). The main biological abnormalities observed were an increase in the inflammation marker (CRP) and hyperglycemia. The average length of hospitalization was 12 ± 9 days.

Conclusion: The Covid-19 pandemic is a threat to public health security; it turns out to be a complex disease, because it is viral, then inflammatory. Our study allowed the collection of epidemiological, clinical, radiological and biological data on cases of death linked to severe SARS-COV-2 infection to better understand the problem of the fatal course of the disease and optimize the management of patients.

Keywords: Death - Severe Covid-19 infection – profiles -Oran -Algeria

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Introduction:

The SARS-CoV-2 infection progresses in three phases; The incubation phase is followed by a symptomatic phase that appears within a median of 5 days after the contagion and that would concern 70% of infected patients. A worsening phase of respiratory symptoms is possible and about 3.4% of patients would develop acute respiratory distress syndrome (ARDS) within a median of 8 days after the first symptoms (1, 2). ARDS mortality is high, around 50% (3).

The most severe form of Covid-19 is pneumonia, characterized by cough, dyspnea and infiltrates on chest CT scan (CT). Clinical features can then not be distinguished from another viral infection of the lungs. Fever is associated with severe dyspnea, signs of respiratory distress, tachypnea (respiratory rate > 30 cpm) and hypoxemia (SpO2 < 90 % in ambient air) (2).

The global mortality trend during the pandemic is varied and difficult to describe due to different stages of COVID-19 waves, periods, various underlying medical conditions of patients and hospital burden (4).

In April 2021, Delta VOC became the new major variant of Covid-19 infection in the world (5).

In July 2021, Algeria experienced a sharp increase in the number of Covid-19 cases recorded, and the Pasteur Institute of Algeria announced a high rate of infections with the Delta variant, which accounted for 71% of the viruses in circulation and whose activity was rising sharply (6).

COVID-19 mortality depends on several factors such as early diagnosis, socio-demographic characteristics, patient history, and early and effective therapeutic management.

The objective of this work was to study the epidemiological, clinical, radiological and biological characteristics of deaths related to severe SARS-COV-2 infection hospitalized at El kerma Hospital – University Hospital of Oran (CHU Oran) during 2021 and specifically during the Delta Variant wave period.

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Materials and methods:

This is a retrospective descriptive study of 144 deaths related to severe SARS-COV-2 infection hospitalized at El kerma Hospital – CHU Oran, during a period of 04 months, from July 1, 2021 to October 31, 2021 (period corresponding to the wave of the DELTA variant). The deaths included in the study were deaths over the age of 18 with a SpO2 measure on admission and with a confirmed Covid-19 diagnosis (by RT-PCR and/or antigenic test and/or by serology and/or chest CT).

Data Collection

The variables studied were : Age, sex, medical personal history, the interval between the onset of symptoms and the date of hospitalization (in days), clinical symptomatology, SPO2 on admission, Biological and radiological para-clinical parameters (CT) at admission and length of hospitalization (in days).

Data Analysis

We performed a descriptive analysis of cases of death related to severe SARS-COV-2 infection, where quantitative variables were represented in mean and standard deviation and qualitative variables in number and percentage by class. Statistical analysis of the data was performed using SPSS.20.0 software.

Results:

A total of 144 deaths related to severe SARS-COV-2 infection hospitalized at El kerma Hospital – Oran University Hospital were studied. Over 60% of the cases were older than 60 years and the average age was 61.7 15.2 years. 80% of cases were male with a sex ratio of 3.9 (Table 1). The notion of associated comorbidity was found in 89% of cases. Diabetes and hypertension were the most frequent comorbidities and the notion of cancer was found in only 0.7% of cases (Table 2).

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Table 1 : Epidemiological profile

	Number of casess	%
Age groups (years)		
20-29	5	3,47
30-39	9	6,25
40-49	17	11,80
50-59	25	17,36
60-69	37	25,69
70-79	49	34,02
+80	2	1,38
Total	144	100
Sex		
Male	115	80
Féminine	29	20
Total	144	100

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Table 2 : Associated comorbidities

	Number of casess	%
Concept of Comorbidity		
Yes	128	89
No	16	11
Total	144	100
Type of comorbidity		
HTA	42	32,81
Diabète	41	32,03
Maladies thyroïdiennes	11	8,59
Maladies chroniques des poumons	9	7,03
Maladies cardiovasculaires	5	3,90
Obésité	4	3,12
Maladies neurologiques	4	3,12
Insuffisance rénale	3	2,34
Maladies psychiatriques	2	1,56
Maladies chroniques du foie	1	0,78
Cancer	1	0,78
Autres	5	3,90
Total	128	100

The delay between the onset of symptoms and hospitalization was greater than 7 days for more than 65% of cases (Table 3) with an average duration of 9.9 7.4 days. The average SPO2 rate was 78.01 13.97%, which is low compared to universal values [ranging from 95% to 100%] (Table 4). Asthenia was the main general symptom with a rate of 73.3%, followed by headaches with a rate of 67.1% and fever with a rate of 63%. Cough was present in 59% of cases. The notion of diarrhea was found in 24.1% of cases. Anosmia and agueusia were reported by 11.6% and 6.8% of cases respectively (Figure 1).

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Table 3: Delay between onset of symptoms and hospitalization

Delay	Number of casess	%
< ou = 7 days	50	34,72
> 7 days	94	65,27
Total	144	100

Table 4 : Clinical parameters

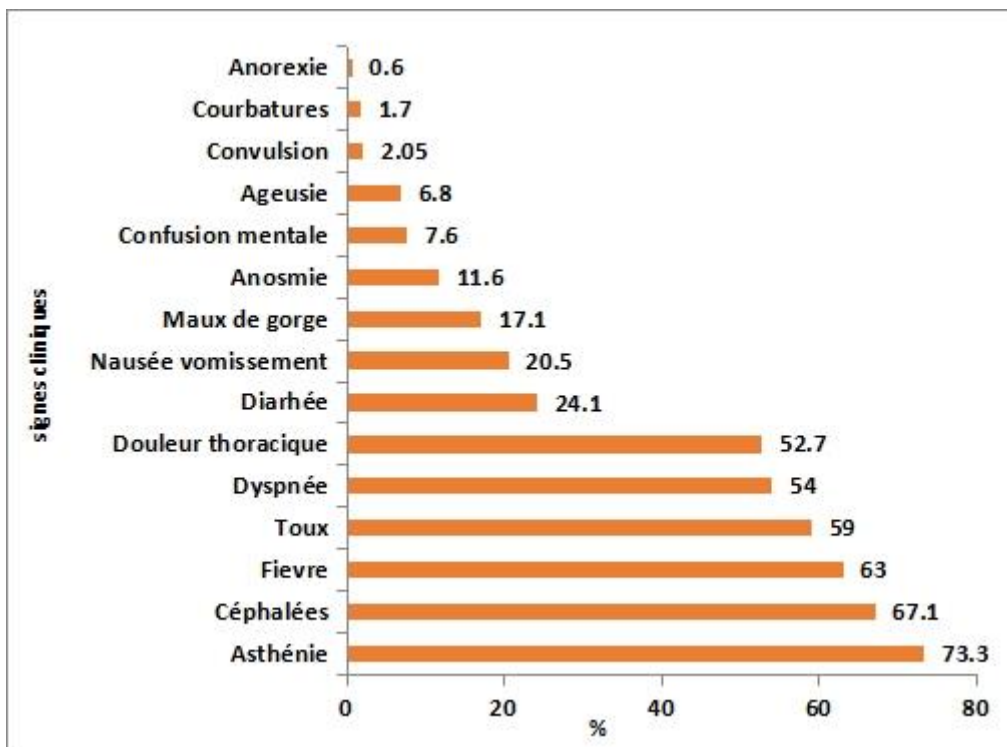|	Mean	Minimum	Maximum
SPO2 (%)	78,01 ±13,97	30	92
Fréquence cardiaque (bpm)	82,54 ± 18,53	53	120
Fréquence respiratoire (cycle/mn)	57,50 ± 36,05	22	96

Figure 1: Clinical symptomatology

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The average rate of radiological involvement on CT was 52.45 25.56% with extremes ranging from 5% to 90%. The mean rate of lymphocytes in cases of death related to severe SARS-COV-2 infection was 593.37 390.48/mm3 reflecting lymphopenia. The mean CRP level was 178.47 145.72 mg/l, indicating the presence of inflammation. The mean urea level was 2.88 1.16 g/l. The mean blood sugar level was elevated from the universal values (1.92 0.94 g/l). The D-dimer values were very high in deaths with an average rate of 5598.75 16226.67 µg/ml (Table 5).

Hospitalization was less than 10 days for more than 65% of cases and the average duration was 12 9 days with extremes ranging from 1 to 56 days (Table 6).

Table 5 : radiological and biological parameters

	Mean	Minimum	Maximum
radiological parameters (TDM)			
TDM %	52,45 ± 25,56	5	90
biological parameters			
Lymphocyte /mm3	593,37 ± 390,48	4	1330
CRP (mg/l)	178,47 ± 145,72	6	131,6
Urée (g/l)	2,88 ±1,16	0	13
Créatinine (mg/l)	15,84 ± 14,95	0	97
Glycémie (g/l)	1,92 ± 0,94	0,4	5
D-dimères (µg/ml)	5598,75 ±16226,67	149	22048

Table 6 : Duration of hospitalization

duration of hospitalization		
1-10 days	94	65,27
11-20 days	39	27,08
> 20 days	11	7,63
Total	144	100

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Discussion :

From 01 July 2021 to 31 October 2021, 144 cases were reported to have died because of Covid-19 at the El kerma- CHU Oran hospital, a male predominance was well highlighted in our series with a sex ratio equal to 3.9. This is similar to data from the Mukhopadhyay A and al. study (7) in India, where they showed that there were more men (62.6%) than women (37.4%) and the Abu-Abbas, L and al. study (8) in Lebanon, where the male sex was 60.41%. by contrast, the study of Duong-Quy, S and al. (9), in Vietnam, showed the predominance of the female sex (69.1%).

In our study, the average age was 61.7 ±15.2 years. This result is slightly higher than those reported by Mukhopadhyay A and al. (7) and Duong-Quy, S and al. (9), made in Iran, with mean ages of 53.4 ±15.4 years and 57.8 ±16.5 years respectively.

A higher risk of mortality was found in cases of severe Covid-19 infection with associated comorbidities. In our series, 89% of deaths had comorbidities. Hypertension was found in 32.81% of cases and diabetes in 30.1% of cases. These results are consistent with those reported by the team of Mukhopadhyay A and al. (7), who described that the main comorbidities found were hypertension (33%), diabetes (35.2%) and cardiovascular diseases (5.5%).

The average duration between onset of symptoms and hospitalization was 9.9 ±7.4 days in our series. This is higher than that reported by the team of Mukhopadhyay A and al. (7), who described that the majority of deaths developed symptoms within an average of 5.6 days of hospitalization.

Asthenia was the main symptom with a rate of 73.3%. This result is similar to that reported by Mukhopadhyay A and al. (7), where asthenia was found in 71.43% of cases.

Respiratory symptomatology was dominated by cough (59%) and followed by dyspnea with a rate of 54%, these results are close to the data of the study of Mukhopadhyay A and al. (7),

Zali A and al. (10) and Righi N and al. (11), whose cough was present in 58.24%, 51.5% and 60% of cases respectively.

Our results did report an average lymphocyte rate (593,37± 390,48/mm3) lower than that described in the Duong-Quy, S and al. study (9), where the mean lymphocyte rate was 731±564/mm3.

C-reactive protein was elevated in deaths with an average rate of 178.47 ±145.72 mg/l. This data was close to the result of the study of Duong-Quy, S and al. (9) where the average CRP was 157± 114 mg/l.

The notion of hyperglycemia was well demonstrated in our series with an average blood glucose level of 1.92 ±0.94 g/l. This result is higher than that of the study of Mukhopadhyay A and al. (7), which reported an average blood sugar level of 1.38 g/l.

The mean rate of D-dimers in deaths was 5598.75 ±16226.67 μg/l. This is higher than the result of the study by Hanh DLM and al. (12), where the average D-dimer level was 1227 μg/ml.

The average length of hospitalization was 12± 9 days with extremes ranging from 1 to 56 days. This result is similar to that described by the study of Righi N and al. (11) where they reported an average hospital stay of 10 days.

Conclusion:

The Covid-19 pandemic is a threat to public health security, it turns out to be a complex disease, because viral, then inflammatory. OUR study reported THE epidemiological, clinical and paraclinical characteristics of 144 deaths related to severe SARS-COV-2 infection hospitalized at El kerma Hospital – University Hospital of Oran (CHU Oran) during 2021 and specifically during the Delta Variant wave period. The results of our study highlighted some remarkable specificities. In this case, an older population, a strong male predominance, a rather long delay before hospitalization and a high rate of diabetics and hypertensive,

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