Factors Associated with Mortality in COVID-19 Patients with Comorbidities Who Were Hospitalized in the Different CT-EPI in the Labe Region, Guinea 2020-2022

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Abstract: Coronavirus infectious disease (COVID-19) shows remarkable symptomatic heterogeneity. To date, only a few demographic and clinical factors, such as advanced age, diabetes, and cardiovascular disease, have been associated with poor outcomes and increased risk of mortality from COVID-19. In the Labe region, the lethality of COVID-19 disease remains high in people with comorbidities. In our study, comorbidities were frequently associated with COVID-19 infection and were dominated by hypertension and diabetes. This recognition may help direct efforts toward prevention and management. The objective of the study was to describe the factors associated with mortality in COVID-19 patients with comorbidities hospitalized in the Labe region (Epidemiological Treatment Centers -CT Epi- and home). *Methods:* The study was carried out in the CT-Epi of COVID-19. It focused on the analysis of 1443 records of patients hospitalized in the CT-Epi of the Labe Region. It was a transversal and analytical study conducted in July 2022. Factors associated with mortality in patients with comorbidities were identified through patient records and content analysis. *Results:* A total of 1443 patients with COVID-19 hospitalized in the Labe region participated in our study, including 244 with comorbidities and 1199 patients with COVID-19

without comorbidities. Among these patients in our study, 823 were men and 620 were women, i.e., a M/F sex ratio of 1.33. The average age was 45 years (Min= 7 years; Max= 99 years). Bivariate analysis showed that there was a statistically significant association between comorbidities and the occurrence of death in patients with COVID-19. There is a positive association between this risk factor, which is comorbidity, and the occurrence of death. Therefore, we say that comorbidities are risk factors that are responsible for the occurrence of death in patients with COVID-19 in the Labe region. *Conclusion*: In our study, advanced age, hypertension, diabetes, HIV, and chronic lung disease were the main risk factors for hospitalization or death due to COVID-19 in the Labe region. Further research is needed to identify risk factors associated with severe forms and mortality of COVID-19 to optimize management of patients with comorbidities. This study places particular emphasis on the priority targets (people over 60 and people with co-morbidities) of accelerated vaccination campaigns against COVID-19.

Keywords: Mortality, Comorbidities, Associated Factors, COVID-19, CT-EPI of Labe, Guinea

1. Introduction

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is an RNA virus first reported in humans in Wuhan, China, in December 2019 [1].

Since then, COVID-19 has spread rapidly around the world and has become a global pandemic affecting more than 200 countries and territories, with an unprecedented effect not only on public health, but also on socio-economic activities [2].

The novel coronavirus 2019 (COVID-19) disease was crowned the second pandemic of the 21st century by the World Health Organization (WHO) on March 11, 2020 [3].

In the world as of July 14, 2022, the "pandemic" has infected more than 557,417,247 people, including 11,979,753 confirmed cases in Africa. In terms of deaths, there are 6,329,672 deaths worldwide, 254,661 of which are in Africa [4].

To date, only a few demographic and clinical factors, such as advanced age, diabetes and cardiovascular disease, have been associated with poor outcomes and increased risk of mortality. A better understanding of the risks for these vulnerable patient populations is essential to optimize their protection and tailor prevention and treatment strategies [5].

A high prevalence of pre-existing cardiovascular disease has been observed in patients with COVID-19, and these comorbidities are associated with increased mortality [2].

Diabetes is one of the major risk factors for fatal outcomes in COVID-19. Diabetic patients are vulnerable to infections due to hyperglycemia, impaired immune function; and comorbidities such as hypertension, dyslipidemia, and cardiovascular disease. In fact, it has been reported that the overall proportion of diabetics with COVID-19 was 5.3-33.9% in China, Italy, and the United States [6]. The severity and mortality of COVID-19 were significantly higher in diabetic patients than in those who did not have COVID-19 [6].

Hypertension is a notable risk factor for increased morbidity and mortality from COVID-19. The prevalence of hypertension in patients with COVID-19 observed in a meta-analysis was 21.1%. In addition, a hazard ratio (HR): 1.7 to 3.05 was reported for mortality in COVID-19 patients with hypertension [3].

Acute kidney injury is also reported to increase during coronavirus infection. Patients with acute renal failure are reported to have a higher mortality rate compared to other patients [7].

The case fatality rate of COVID-19 in the United States increases with age from 3% to 5% between 65 and 74 years of age, 4% to 11% between 75 and 84 years of age, and 10% to 27% beyond 85 years of age. Among COVID-19 patients over 65 years of age, there were 45% hospitalizations, 53% intensive care unit (ICU) admissions, and 80% deaths [8].

Two (2) studies conducted in China had shown that the mortality rate is 0.1% in children and 14.8% in the elderly and comorbidities were found in 53% of the deceased patients [9, 10].

In France, a cohort study of 67 million patients in 2020 found 0.38% heart failure 0.20% stroke 0.13% diabetes among deaths in the first wave compared with 0.51%; 023%; 0.14%, respectively, in the second wave COVID-19 [11].

In Algeria, a study of diabetic patients with COVID-19 revealed a 10% death rate [12].

A study conducted in Mali revealed that diabetes and cardiovascular disease remain the most frequent comorbidities among deaths with 20.45% and 17.42% respectively [13].

In Guinea, the first case of COVID-19 was reported on March 12, 2020, and to cope with this pandemic, the country has set up management structures. Thus, as of July 31, 2022, 779 deaths due to COVID-19 have been recorded, including 440 hospital deaths and 339 community deaths [14].

The administrative region of Labe is one of the 8 health regions of the country affected by COVID-19 and the disease has spread to all 5 health districts of the region with 1443 confirmed cases and 68 deaths [15].

A study carried out at the Donka National Hospital on the epidemiological and clinical characteristics of patients with COVID-19 admitted to the intensive care unit showed a predominance of arterial hypertension in patients with COVID-19 of 55% compared to other comorbidities [15].

Like other countries, Guinea, through the National Health Security Agency (ANSS) of the Ministry of Health and Public Hygiene and its main partners such as WHO, CDC, IOM, MSF, and UNICEF, has put in place adequate response strategies to reduce the risk of spread of the disease, and above all to limit the mortality rate of affected persons in general and of patients tested positive for COVID-19 with co-morbidities "i.e., vulnerable patients" in particular [16].

Currently, the health authorities in the Labe region do not have sufficient information on covid-19 patients with comorbidities who were hospitalized in epidemiological treatment centers and/or isolated at home and who died. Hence, the interest of the present study, the results of which may help to shed light on grey areas in order to provide useful information to decision-makers. The results of this study can be used to improve the quality of care of patients in epidemiological treatment centers and at home. [17].

2. Material and Methods

This is a transversal and analytical study with the objective of describing the factors associated with mortality of patients with COVID-19 with comorbidities and hospitalized in the Labe region. The study covers the period from 1er May 2020 to 30 June 2022.

A pre-tested, semi-structured data collection form was used for data collection. We used the Kobo collect software through experienced interviewers to collect data in the field. The COVID-19 database of the CT-EPI of the Labe Region and that of the National agency for Security Health (ANSS) were used for the data collection and this allowed the selection of participants. A total of 1443 patients, including 244 with comorbidities and 1199 without comorbidities who were hospitalized for COVID-19 in the epidemiological treatment centers (CT-Epi) of the Labe Region participated in this study. The data were exported to EXCEL software for cleaning. These cleaned data were exported to SPSS version 22.0 for analysis.

The central tendency parameters, namely mean, median, mode and standard deviation were used. We used two (2) types of analyses, namely descriptive analysis and statistical analysis to establish causality. We used Person's chi-square test and logistic regression to determine if there was an association between comorbidities and the occurrence of death.

3. Results

A total of 1443 COVID-19 patients hospitalized in the Labe Region participated in our study, including 244 with comorbidities and 1199 COVID-19 patients without comorbidities. Among these patients in our study, 823 were men and 620 were women, i.e., a M/F sex ratio of 1.33. The average age was 45 years (Min= 7 years; Max= 90 years).
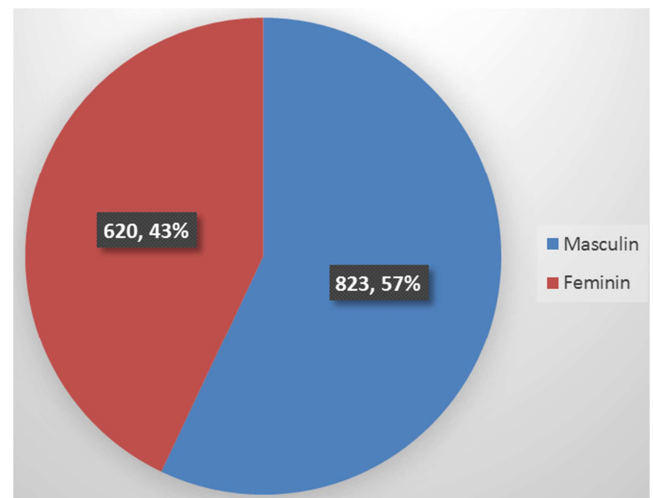

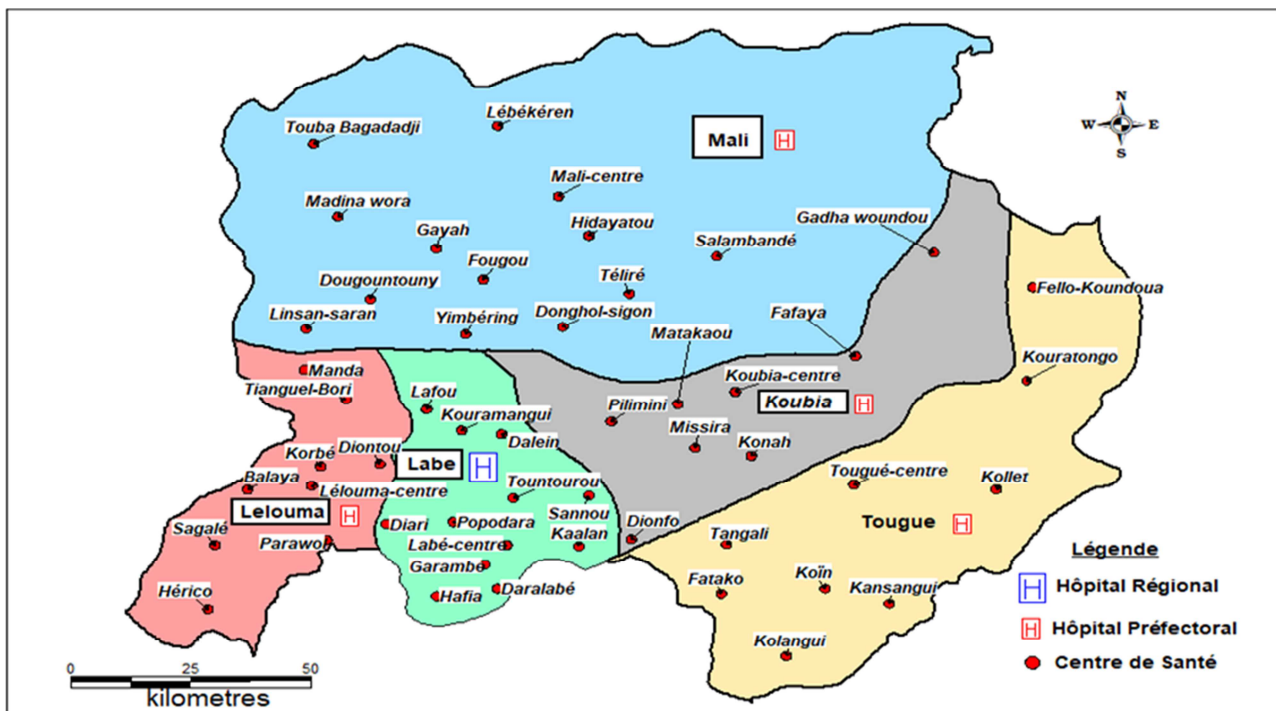**Figure 1.** *Sex distribution of COVID-19 patients in the Labe Region, 1er May 2020-June 2022.*

Figure 2. *The epidemiological treatment centers in the Labe region which were used as a framework for this study.*

Table 1. *Socio-demographic characteristics of COVID-19 patients with comorbidities and without comorbidities in the Lable Region, 1ᵉʳ May 2020-June 2022.*

Gender	Patients with comorbidities		Patients without comorbidities	
	Number (N= 244)	(%)	Number (N=1199)	(%)
Female	118	48	502	42
Male	126	52	697	58
Age range	Average age: 45 years Minimum age: 7 years Maximum age: 90 years			
≤ 20 years	2	1	189	16
21-40 years old	10	4	484	40
41-60 years old	86	35	256	21
61-80 years old	123	50	230	19
80 years and older	23	9%	40	3%
Profession				
Director	16	6,6	21	1,8
Health Officer	12	4,9	133	11,1
Farmer	24	9,8	107	8,9
Driver	8	3,3	44	3,7
Teacher	1	0,4	72	6,0
Student	27	11,1	175	14,6
Manager	11	4,5	75	6,3
Merchant/Dealer	28	11,5	83	6,9
Housekeeper	92	37,7	277	23,1
OTHER	25	10,2	212	17,7

Table 2. *Distribution of COVID-19 patients in Lable region according to place of hospitalization, clinical status and disease outcome from May 1, 2020-June 2022.*

| Place of hospitalization	Patients with comorbidities		Patients without comorbidities	
	Number (N= 244)	(%)	Number (N=1199)	(%)
CTEpi Koubia	0	0,0	111	1,3
CTEpi Lable	146	59,8	76	6,3
CTEpi Lelouma	12	4,9	587	49,0
CTEpi Mali	59	24,2	83	6,9
CTEpi Tougué	21	8,6	206	17,2
Domicile Koubia	0	0,0	101	8,4
Place of residence Lable	6	2,5	25	2,1
Domicile Lelouma	0	0,0	106	8,8
Symptoms				
Asymptomatic case	27	11	669	55,8
Leger/Minor case	106	43	308	25,7
Moderate case	44	18	125	10,4
Severe case	56	23	92	7,7
Critical Case	11	5	5	0,4
Outcome of the disease				
Healed	189	77	1096	91
Deceased	29	12	38	3
Transferred	26	11	54	5
Escapees	0	0	11	1
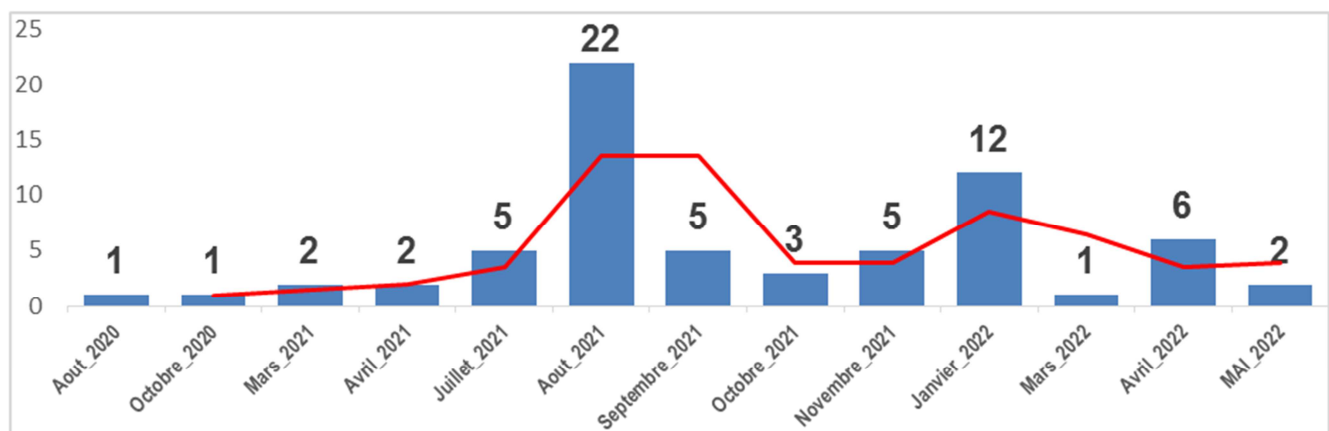
Figure 3. *Evolution of notified deaths in the different epidemiological treatment centers and those isolated at home in the Lable region, August 2020 to 30 June 2022.*

Table 3. *Distribution of COVID-19 patients in the Labe Region by outcome and by health district from 1er May 2020 - June 2022.*

Health district	Hospitalized	Healed	Transferred	Escapees	Deceased
Koubia	111	104	5	0	2
Labe	802	693	45	9	50
Lelouma	125	121	1	1	5
Mali	280	241	30	0	9
Tougué	129	126	1	1	1
Total (region)	1443	1285	80	11	67

Table 4. *Distribution of COVID-19 patients in the Labe Region according to their length of stay at the hospitalization site, 1er May 2020 - June 2022.*

Headings	Minimum length of stay for patients	Average length of stay of patients	Maximum length of stay for patients
Patients with comorbidities	24 hours	15 days	60 days
Patients without comorbidities	72 hours	22 days	70 days
Patients with COVID-19 vaccinated	6 days	16 days	32 days
Unvaccinated COVID-19 patients	9 days	31 days	68 days
COVID-19 patients who died with comorbidities	24 Hours	4 days	11 days
Patients who died without comorbidities	72 hours	16 days	40 days
Minimum duration: 24 hours Average duration: 17 days Maximum duration: 70 days			

Table 5. *Distribution of COVID-19 patients with comorbidities in Labe region according to types of comorbidities and types of vaccines administered Labe, 1 May 2020 - June 2022.*

Type of co-morbidities	Number (N=244)	(%)	Deceased
HTA	117	48	20
Diabetes	97	40	8
Diabetes +HTA	29	12	5
HIV	13	5	1
Chronic lung diseases	10	4	0
Hepatitis	3	1,22	0
Cancers	4	1,63	0
Types of vaccines	Number (N=26)	(%)	People who died having been vaccinated
Astra-zeneca	15	58	1
Pfizer	1	4	1
Sinopharm	5	19	0
Sinovac	5	19	0

Table 6. *Bivariate analysis between gender, comorbidities and occurrence of death in COVID-19 patients with comorbidities in the Labe Region, 1er May 2020 - June 2022.*

SEX	Deaths		Chi-square	P value
	Yes	No		
F	12	118	2,03	P > 0,05
M	17	126		
Comorbidities				
Yes	29	215	11,12	P < 0,005
No	38	1161		
Type of co-morbidities	Number (N=244)	Deceased		
HTA	117	20		
Diabetes	97	8		
Diabetes +HTA	29	5	3,623	P < 0,005
HIV	13	1		
Chronic lung diseases	10	0		
Hepatitis	3	0		
Cancers	4	0		

Table 7. *Logistic regression of the types of comorbidities and the occurrence of death in COVID-19 patients with comorbidities in the Labe Region, 1er May 2020 to 30 June 2022.*

Comorbidities	Bi-varied analysis		Multivariate analysis	
	OR [95% CI]	p-value	OR [95% CI]	p-value
HTA	0,25 [0,20-0,32]	< 0,001	0,29 [0,22-0,38]	0,001
Diabetes	0,26 [0,20-0,34]	< 0,001	0,32 [0,17-0,62]	< 0,001
HIV	1,85 [1,08-3,19]	0,027	7,39 [3,76-14,51]	< 0,001
Chronic lung diseases	0,58 [0,30-1,12]	0,105	0,72 [0,46-1,14]	0,161
Hepatitis	1,46 [0,89-2,41]	0,136		
Cancers	0,40 [0,16-1,03]	0,058		

4. Discussion

The objective of our study was to describe the factors associated with mortality in COVID-19 patients with comorbidities hospitalized in the Labe region (CT Epi and home) from 1er May 2020 to 30 June 2022.

This study allowed us to gather available information and determine the most common comorbidities in deceased COVID-19 patients, and the risk factors occurring in COVID-19 patients in the Labe region. We assessed the current evidence of associations between risk factors and mortality.

With regard to gender, this study showed that 57% of COVID-19 patients in the Labe region were male, a sex ratio of 1.33. Our result is comparable to that of Weizman O et al who found a male predominance of 57%, a sex ratio of 1.37. Our study is similar to that of L. Aazri, M. Ijim, S. Ait-Batahar, L. Amro in 2021 who reported in their study that males represented 55.3% of notified cases [19].

Regarding the distribution by sex and comorbidities, among COVID-19 patients with comorbidities, 52% were male, corresponding to a sex ratio of 1.06, and among COVID-19 patients without comorbidities 58% were male, corresponding to a sex ratio of 1.38. Our result is different from that found by A Diawara et al in Niger in 2022 who found in their study that 34% of COVID-19 patients had at least one associated chronic disease. [20]

Regarding age, the most represented age range among those with comorbidities is 61-80 years with 123 cases or 50% of this population. Among the population of COVID-19 patients without comorbidities, the most represented age range is 21-40 years representing 40% of the latter. Our results are like those found by F Yahia et al in 2020 in Tunisia who reported a mean age of 45 years. This could be explained by the fact that the elderly presents more comorbidities than the young and that age is a risk factor for this disease. [21]

Concerning the profession, in the patients with COVID-19 with comorbidities, housewives with 92 cases or 37.7% were the most represented while in the patients without comorbidities the housewife profession was the most represented with 277 cases representing 23.1% [21]. The least represented profession was that of administrators with only 21 cases or 1.8%. This result could be explained by the fact that the prison population is mostly young and at this age there are few or no comorbidities.

The region of Labe has five (5) Epi CTs corresponding to the health districts of the region and in addition to the Epi CTs, patients were hospitalized at home in 3 health districts, namely Labe, Koubia and Lelouma.

Thus, more than half of the COVID-19 patients with comorbidities in the region, 149 cases or 59.8%, were hospitalized in CT Epi de Labe and 6 cases or 2.5% at home, followed by CT Epi de Mali with 59 cases or 24.2%. However, the CT Epi of Koubia did not hospitalize any COVID-19 patients with comorbidities. This could be explained by the fact that many covid-19 patients from Koubia were hospitalized in the CT-Epi of Labe due to their proximity, but above all due to the notorious insufficiency of human resources at the CT-Epi of Koubia. The patients as soon as they feel the first signs prefer to come and consult the CT-Epi of Labe instead of waiting to be referred in difficult conditions.

Regarding COVID-19 patients without comorbidity, more than half were hospitalized in the CT-Epi of Labe and Tougue, 66.2% of the cases in Labe. The CT Epi of Koubia hospitalized the smallest number of cases, only 15 cases, representing 1.3% of the COVID-19 patients without comorbidities in Labe region. It should also be noted that some patients from the surrounding health districts, notably Dalaba, Pita and Gaoual, and some patients from the health districts of the Labe region were referred to and hospitalized at the CT Epi of Labe because of its technical facilities, which are more efficient than those of other CT Epi. This could be explained by the high number of hospitalized cases in the Labe health district.

According to the distribution of COVID-19 patients in the Labe region by clinical status, more than half (56%) of COVID-19 patients with comorbities were severe cases and 5% were in critical condition while among COVID-19 patients without comorbidities, more than half (58%) were asymptomatic cases and less than 1% were in critical condition.

Regarding the outcome of the disease, the case fatality rate of patients with COVID-19 in the Labe region is only 5%, a level that is much higher than the national level, which is around 2%.

The cure rate for patients with COVID-19 in the Labe region is 89%. It should be noted that 80 patients with COVID-19, i.e., 6%, were transferred to the capital city of Conakry for adequate care. We also noted that 11 cases (1%) escaped from the CT-Epi despite many security guards deployed in all over the centers.

Regarding hospital deaths, the Labe CT-Epi recorded the greatest number of deaths (50 out of 67 notified), i.e., 75% of the total number of deaths recorded in the Labe administrative region, followed by Mali (9 deaths, i e. 13%), Lelouma (5 deaths, i.e. 7%), Koubia (2 deaths, i.e. 3%) and Tougue (1 death, i.e. 1%).

The high death rate could be explained by:

1) Delay of patients in communities due to the use of traditional medicine.
2) Lack of fuel for the operation of the CT-Epi and the transfer of critically ill patients and those with co-morbidity.
3) Lack of intensive care units for the management of serious patients with comorbidity.
4) Lack of oxygen tanks for resuscitation of patients with comorbidities.
5) Insufficient trained staff and insufficient support for the coordination and operation of the EOC-SP.

We also reported that at the Mali CT-Epi 30 out of 280 (10%) and Labe 45 out of 802 (6%) patients were evacuated to the Conakry and Kindia CT-Epi for appropriate care. Of

the 80 patients evacuated, the Labe CT Epi alone evacuated 45 patients to the Conakry CT Epi. These high numbers of evacuations, 80 (4.5%) and deaths, 67 (6%), are sufficient proof of the need for assistance from these different CT-Epi in terms of improving the quality of care, equipment, and capacity building of care personnel. The high number of escaped patients (11 patients) at the CT-Epi level despite the presence of security services, leads us to question the importance of the security services put in place to monitor response activities.

For COVID-19 patients with comorbidities, there were 29 cases or 12% death, 189 cases or 77% cure and 26 cases or 11% transferred. While in patients with COVID-19 without comorbidities, we noted 1096 cases or 91% of them were treated from the CTepi, 38 cases or 3% of death, 61 cases or 5% of transferred and 11 cases of escaped or 1%.

From this study, it was found that those with comorbidities had a higher mortality rate than subjects without comorbidities; however, there were more recoveries in patients without comorbidities than those with COVID-19 disease with comorbidities. This result of our study is similar to that found by A Diawara et al who found 22.1% death in disease with comorbidities and 7.3% death in patients without comorbidities. [22].

In relation to the length of hospitalization of patients with COVID-19, the shortest length of stay was observed in patients with comorbidities (24 hours) and the longest length of stay was observed in patients without comorbidities and was 70 days. A longer length of stay was also observed in subjects vaccinated against the disease than in those who did not receive the vaccine. Similarly, patients who died with comorbidities had a shorter length of stay than those without comorbidities. The results of our study are different from those found by A D Dia et al in-Saint louis, Senegal in 2021 who found that the average length of hospitalization was 11.6 ± 3.6 days. [23]

Only 26 people with COVID-19 or 1.8% claimed to have received the vaccine. Among these vaccinated subjects 15 persons or 58% received Astrazeneca and 19% took Sinopharm, 19% took Sinovac and 4% took Pfizer. The case fatality was 7.6% in vaccinated COVID-19 patients and 12.38% in non-vaccinated COVID-19 patients. Our results are close to those found by S Abdallah et al who found that case fatality was 12% in unvaccinated patients or those who received a first dose of the vaccine, and 9% in vaccinated patients. Vaccination reduces mortality from COVID-19 in patients with comorbidities.

Regarding the types of comorbidities, arterial hypertension was the most frequent with 117 cases or 48% of COVID-19 patients with comorbidities, followed by diabetes with 97 cases or 40% of cases. The association of COVID-19 plus diabetes and hypertension was observed in 29 patients or 11.88%. 13 subjects or 5.32% had HIV in addition to COVID-19 and cancers were the least frequent with only 4 cases or 1.63% of COVID-19 patients with comorbidities. Our result is similar to that of Wern Hann Ng et al. in China in 2021 reported in a meta-analysis independent risk factors

for mortality were reported in 22 studies, and these risk factors included hypertension, obesity, diabetes, renal disease, chronic obstructive disease (COPD), neurological disease and cardiovascular disease [23].

Bivariate analysis showed that there was a statistically significant association between comorbidities in COVID-19 patients and the occurrence of death in COVID-19 patients with comorbidities (Chi-square =11.12 and P < 0.05).

There is a positive association between this risk factor, which is comorbidity, and the occurrence of death, and therefore we say that comorbidities are risk factors that are responsible for the occurrence of death in patients with COVID-19 in the Labe region.

The results of the study showed that among the 117 patients with COVID-19 or 48% who had hypertension, 20 people or 8.19% died and among the 97 patients or 40% who had diabetes, 14 of them or 5.73% died. As for the 29 patients with COVID-19 (11.88%) with the association of diabetes and arterial hypertension, 5 people or 2% died and among the 13 subjects or 5.32% who had HIV one (1) person or 0.4% died.

COVID-19 patients with comorbidity are at higher risk of death (12%) compared with those without comorbidity (3%).

From the graph_2 that it appeared that the greatest number of deaths were reported in August 2021 with 22 deaths, followed by January 2022, with 12 deaths. In April 2022, 6 deaths were reported. We also noted that for July 2021, 5 deaths were notified, September 2021, 5 deaths were notified and November 2021, 5 deaths were notified. Of the 22 deaths reported in COvid-19 patients in August 2021, 18 were recorded at the CT-Epi level and the other four deaths were recorded at the community centers and the other 6 deaths were reported in the community.

The comparison of reported deaths in covid-19 patients (2) before the introduction of covid-19 vaccination and reported deaths since the start of vaccination (65), showed that more than 97% of deaths were recorded after the introduction of vaccination in our country. The high number of reported deaths after the introduction of vaccination could be explained by the fact that among the 67 deceased patients, only 2 patients or 2.9% received at least one dose of any kind of vaccine. The other 67 patients, 97.01%, were not vaccinated despite the introduction of the vaccines. The non-vaccination of the population in the region is believed to be due to the lack of public awareness sessions on the importance of vaccination against covid-19.

Bivariate analysis showed that there was no statistically significant association between gender and comorbidities in COVID-19 patients with comorbidities in the Labe Region (Chi-square =2.03 and P > 0.05).

However, it showed that there was a statistically significant association between types of comorbidities and the occurrence of death in COVID-19 patients with comorbidities (Chi-square =3.623 and P < 0.05). There was not a positive association between this risk factor of comorbidity and gender.

There is a positive association between these risk factors

which were these types of comorbidities and the occurrence of deaths and we can admit that the types of comorbidities are risk factors that are responsible for the occurrence of death in patients with COVID-19 in the Labe Region.

In our study, hypertension and diabetes were significantly associated with mortality in univariate and multivariate analysis; HIV was significantly associated with mortality only in multivariate analysis. Chronic lung disease, hepatitis and cancer were not associated with mortality in either univariate or multivariate analysis. Our result is different from that reported by A. R. Ouedraogo et al in Burkina Faso in 2021 who found that: in univariate analysis, age greater than 65 years (HR: 2.7; 95% CI: 1.5-5.1) and hypertension (HR: 1.9; 95% CI: 1-3.5) were independently associated with the risk of death. However, after adjustment, only age >65 years (HR: 2.3; 95% CI: 1.2-4.3) was a risk factor for death. [25]

5. Conclusions

In our study, it was found that hypertension, diabetes, HIV, chronic lung disease, cancer and hepatitis are the main risk factors for hospitalization or death from COVID-19 in patients with comorbidities in the Labe region. The lethality of COVID-19 disease remains high in people with comorbidities.

Our study shows a statistically significant association between comorbidities in COVID-19 patients and the occurrence of death in COVID-19 patients with comorbidities.

Comorbidities were frequently associated with COVID-19 infection in our study and were dominated by hypertension and diabetes. This recognition could help direct efforts toward strengthening prevention activities and management. This provides a rationale for improving prevention for people with chronic conditions and prioritizing them for future interventions against viral infections.

The results of this study may help healthcare workers improve the management of patients with comorbidities who are at risk of death. They will also be useful to policymakers in continuing to develop and implement regulations to curb the spread of COVID-19 and other infections. Further research to identify risk factors associated with severe forms and mortality of COVID-19 is essential to optimize management of patients with comorbidities. This study also highlights the fact that people with comorbidities are priority targets for COVID-19 awareness and vaccination campaigns, among others.

In addition, our study lifts a corner of the veil on the need to provide the CT-EPI and the hospitals of the Labe Region with resuscitation services equipped with adequate materials and qualified human resources.

People to Be Quoted in This Article

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