Research Article

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COVID-19 Associated Cardiovascular Risk Factors in a Medical Facility in Bamako, Mali

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Abstract

Objective: To study the major cardiovascular risk factors in COVID-19 patients at the "La Rosette" clinic in Bamako.

Material and Methods: This was a cross-sectional and descriptive study that took place from May 2021 to April 2022 at the **"**La Rosette**"** clinic (private medical structure specialized in medical imaging). Involved were patients of both sexes over the age of 15 years referred for computed tomography (CT) and thoracic CT angiography as part of a COVID-19 infection assessment. An individual survey form was used to collect epidemiological data. Angio CT was performed on a General Electric device, 8 strips with cuts of 2.5 to 3mm. The interpretation of the results was carried out by a college of specialists in medical imaging. The data collected were analyzed by SPSS version 20.

Results: We collected 188 patients. The predominance was female (52.7%) with a high frequency in the age group of 45 to 54 years (35.1%). All patients resided in Bamako. Housewives were the majority (47.7%) followed by traders (42.6%) and marabouts (22.3%). Hypertension was the most found risk factor (59.6%) followed by physical inactivity (54.2%), diabetes (38.8%) and active smoking (11.17.6%). The ground glass lesions were mostly unilateral (83.5%), they were associated with pulmonary embolism in 22.3%).

Conclusion: Hypertension, diabetes and active smoking were the major cardiovascular risk factors most associated with COVID-19.

Keywords

Cardiovascular risk factors, COVID-19, Bamako.

INTRODUCTION

Coronavirus Disease 2019 (COVID-19), starting end of 2019 has been declared a pandemic by the World Health Organization (WHO) on March 11, 2020. The WHO reported in April 1, 2020 reported 911,541 confirmed cases of COVID-19 and 45,532 deaths worldwide [1]. COVID-19 can have a direct impact on the cardiovascular system. Pre-existing cardiovascular disease can predispose to or aggravate COVID-19 infection. Severe acute respiratory syndrome coronavirus 2 (SARS CoV-2) infects host cells through angiotensin receptors, leading to COVID-19 pneumonia. At the cardiac level, the virus has a dual impact; Indeed, the infection will be more serious if the host has cardiovascular comorbidities, and the virus can cause cardiovascular lesions that can be life-threatening [1]. Few data are available on the cardiovascular risk factors associated with SARS-CoV-2 infection in Mali, motivating the present study with the aim of characterizing the epidemiological profile and identifying the major cardiovascular risk factors in patients with COVID-19 infection at the "La Rosette" clinic in Bamako.

MATERIAL AND METHODS

This was a cross-sectional and descriptive study performed from May 2021 to April 2022 at the

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"La Rosette" clinic (a private medical facility specializing in medical imaging). Recruitment concerned patients of both sexes aged 15 years and more referred for Computed Tomography (CT) and Thoracic CT Angio as part of a COVID-19 infection assessment. An individual survey form was used to collect epidemiological data. CT Angio was performed on a General Electric 8-strip device with slices of 2.5 to 3 mm. The interpretation of the results was carried out by a college of medical imaging specialists.

The 5-stage classification of French thoracic imaging society has been used : Minor (less than 10%, Moderate 10-25%, Extended 25-50%, Severe 50-75 and finally critical for more than 75% parenchymal lesion), The data collected were analyzed by SPSS version 20.

RESULTS

We collected 188 patients residing in Bamako with 52.7% female patients and 35.1% in the age group 45-54 (Figure 1). Housewives were the majority (47.7%) followed by traders (42.6%) and marabouts (22.3%) (Figure 2).

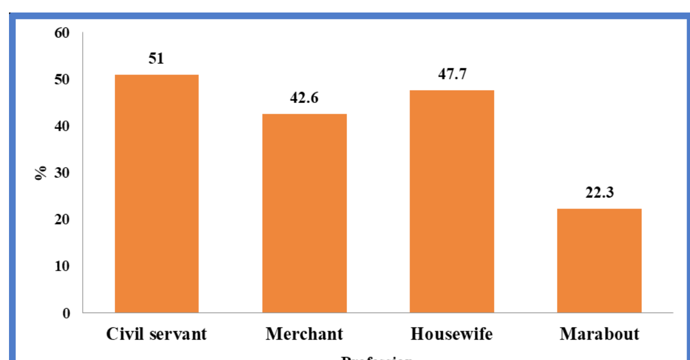

Figure 1: Age group distribution in a sample of 188 COVID-19 patients.

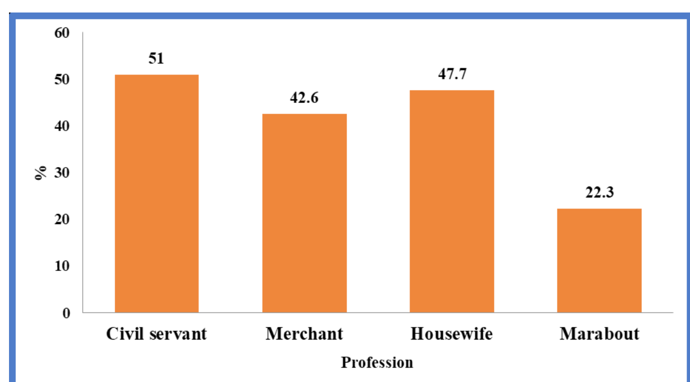

Figure 2: Profession distribution in a sample of 188 COVID-19 patients.

Patients came from as well as university hospitals as from community and private hospitals (Table 1). Hypertension (HTN) was the most common cardiovascular risk factor (59.6%) followed by sedentary lifestyle (54.2%), type 2 diabetes (38.8%) and active smoking (11.17%) (Figure 3). Chest CT revealed the presence of unilateral ground glass lesions in 83.5%, they were associated with pulmonary embolism in 22.3%. a proportion of 19 and 14.4% of the patients had moderate and severe parenchymal lesion respectively (Table 2).

Table 1: Origin distribution in a sample of 188 COVID19 patients.

Provenance	N	%
UH* Pt G	39	20.74
UH* Gabriel Toure	40	21.28
UH* Luxembourg	7	3.72
UH* Hopital du Mali	8	4.26
**CSRef	34	18.09
Private facilities	38	20.21
Military Hospital	22	11.70

*UH: University Hospital** Centre de Santé de Référence (district hospital).

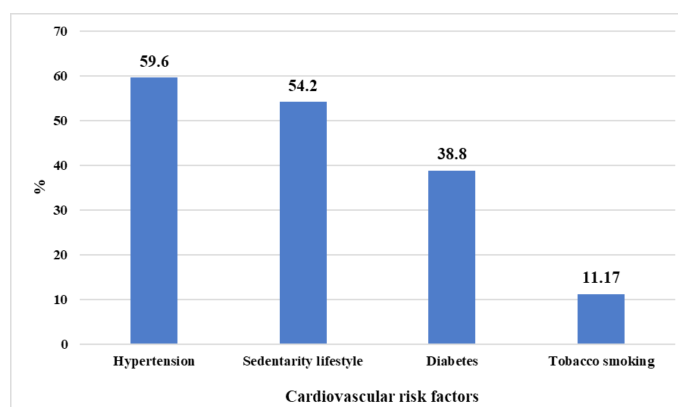

Figure 3: Cardiovascular risk factor distribution among the sample of 188 COVID19 patients.

Table 2: Severity distribution in a sample of 188 COVID19 patients.

Stage	N	%
Minor	125	66.49
Moderate	36	19.15
Severe	27	14.36

DISCUSSION

The work was carried out in the context of a pandemic of a potentially contagious viral disease that was little known at the time. The usual precautions required maximum preventive measures and in our situation we used the prevention recommendations issued by the World Health Organization. The predominance was female (52.7%) in our study unlike the series of Chibinda BY in the Democratic Republic of Congo (DRC) where the predominance was male [2]. The average age of our patients was 53 years with extremes of 15 to 82 years close to the data from the DRC. COVID-19 was more common (52.8%) in the 45-64 age group in our series, while it was 43.5% after 60 years in the South Kivu series in the DRC.

Currently available studies seem to indicate a high prevalence of hypertension in patients hospitalized for COVID-19, regardless of the geographic focus of the epidemic [3-5], varying from 15 to more than 50% in the literature. This high prevalence of hypertension in severe forms of COVID-19 seems to be explained more by the close correlation between hypertension and age, on the one hand, and hypertension and cardiovascular diseases, on the other hand, than by a direct causal relationship. In our study, the prevalence of hypertension was 59.6%, significantly lower than that found in Italy (73%) but higher than the data reported by Guan et al. (15%), Zhou et al. (30.4%), Wang et al. (31.2%), Huang et al. (14.6%), Ruan et al. (34.7%), Wu et al. (19.4%) in China during the same period [6-11].

In the DRC in South Kivu, Chibinda BY et al. found the association HTA COVID-19 in 38.2% [2]. Sedentary lifestyle, frequently found among housewives, traders and marabouts was associated with COVID-19 (54.2%) in our series without there being an established causal relationship. However, the role of physical activity in reducing symptoms and mortality in conditions such as influenza or those affecting the respiratory system is known [12,13]. The results of a first study involving 48,440 patients with COVID-19 are favorable to the practice of physical or sporting activity [14].

The association of type 2 diabetes and COVID-19 was found in 38.8% of our patients, a prevalence slightly higher than the Chinese series with 30.4%, 31.2% and 34.7% respectively by Zhou et al., Wang et al., Ruan et al. but also Italian (33.9%). This association was found in 29.2% in the DRC.

We found an association between active smoking and COVID-19 in 11.17% of our patients. This result is slightly lower than the 14.4% of Guan et al. but higher than the 5.8% and 7.3% reported respectively by Zhou et al., Huan et al. in China. A large meta-analysis recently updated [15] seems to confirm this low prevalence of COVID-19 in smokers. But in the absence of matched case-control studies, these observational data must be analyzed taking into account many possible biases. The presence of ground glass lesions on chest CT was the determining morphological diagnostic element, the lesions were unilateral in the majority of cases.

CONCLUSION

Hypertension, diabetes and active smoking were the major cardiovascular risk factors most associated with COVID-19 without any causal effect being clearly established in the current state of our knowledge at the time of the study.

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