Homeless people hospitalized with COVID-19 in Brussels

Loïc Schrooyen 1,*, Marc Delforge 1, Faustine Lebout 1, Thibaut Vanbaelen 1, Amaryl Lecompte 1, Nicolas Dauby 1, 2, 3

1) Department of Infectious Diseases, CHU Saint-Pierre, Brussels, Belgium
2) Institute for Medical Immunology, Université Libre de Bruxelles (ULB), Belgium
3) Environmental Health Research Centre, Public Health School, Université Libre de Bruxelles (ULB), Brussels, Belgium

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To the editor,

Compared to the general population, homeless people have higher mortality related to both communicable and non-communicable diseases; this can be explained in part by greater exposure to risk factors (including alcohol, illicit drugs and smoking) [1,2]. Transmissible infectious diseases contribute significantly to the morbidity and mortality of the homeless [1]. Notably, airborne diseases such as tuberculosis, influenza and pneumococcal pneumonia have been reported with increased incidence and severity in homeless populations [2]. Shelter overcrowding and limited access to hygienic supplies could enhance the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in this vulnerable population.

We assessed the prevalence, incidence and outcome of homeless patients hospitalized with COVID-19 in our institution between 3rd March and 26th May 2020. Sociodemographic features and risk factors were compared with those of non-homeless patients admitted during the same period.

Only symptomatic hospitalized patients with SARS-CoV-2 positive RT-PCR or rapid antigen test with evidence of pneumonia on computed tomography were included. Nosocomial cases and pregnant women were excluded. Demographic data were collected and included age, gender, smoking, alcohol abuse, methadone therapy for opioid substitution, HIV, hepatitis B virus and hepatitis C virus serological status, and chronic comorbidities such as arterial hypertension, diabetes, obesity, and neurological, cardiovascular and pulmonary diseases. Homeless patients were retrospectively identified based on systematic social inquiry performed upon admission. In order to assess disease severity and outcome, each (homeless) case was matched to three controls based on sex and age categories. Non-parametric Wilcoxon's and Fisher's exact tests were used for continuous and binomial variables analyses, respectively.

Between 3rd March and 26th May 2020, 14 homeless people were identified among 238 patients hospitalized for COVID-19 pneumonia, a homelessness prevalence of 5.88%. All but three resided in homeless shelters. Incidences of COVID-19 among homeless and non-homeless patients were calculated using a homeless census report and our hospital catchment population. According to the last homeless census report, there were 2151 homeless people in Brussels in November 2018 [3]. Most of them were found to attend homeless shelters located in the downtown area surrounding our hospital. The Centre Hospitalier Universitaire (CHU) Saint-Pierre is a public tertiary hospital which works closely with public social services of the capital and is a referral centre for resource-limited patients in Brussels City. The estimated catchment population of our institution was 122 808 people in 2018 (data provided by the Federal Public Health Service, Food Chain and Safety Environment). For the reporting period, incidences were 650 and 194/100 000 hospitalized homeless and non-homeless patients for COVID-19, respectively.

The median age was 56.36 (standard deviation ± 16.76) and 61.78 (standard deviation ± 16.87) years for homeless and non-homeless patients, respectively. We observed a male predominance in both populations (71.43% and 58.04%). Compared to non-homeless patients, the homeless were more likely to smoke (OR 37.17, 95%CI 3.90–378.2), to suffer from alcoholism (9.82, 95%CI 5.38–19.4), to be treated with methadone for opioid substitution (OR 71.4%, 95%CI 3.90–138.2) and to have neurological diseases (OR 58.8, 95%CI 1.84–18.64).

There was no difference between the two groups in terms of C-reactive protein and lactate dehydrogenase levels and lymphocytes...
Our results illustrate the urgent need for implementing strategies to stop the spread of COVID-19 in the homeless population. Strategies based on wide-scale prevention, screening and management of COVID-19 infection have been shown to be efficient in reducing SARS-CoV-2 transmission among homeless people [5,6].

Transparency declaration

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Ethical approval

The study was approved by the Ethics Committee of CHU Saint-Pierre.

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Table 1
Comparison of severity and outcome of COVID-19 between homeless and age and sex-matched non-homeless controls

| Outcome                                | Homeless (n = 14) n, (%) | Non-homeless (n = 42) n, (%) | p     |
|-----------------------------------------|--------------------------|-------------------------------|-------|
| Admission CRP level (mg/L), median (IQR) | 79.6 (30.4; 191.2)       | 84.3 (51.7; 151.7)            | 0.62  |
| Admission LDH level (UI/L), median (IQR) | 397 (316; 487)           | 416 (238; 489)                | 0.92  |
| Admission lymphocyte count (/μL), median (IQR) | 1065 (980; 1620)         | 880 (690; 1270)               | 0.10  |
| Symptoms delay before admission (days), median (IQR) | 6.0 (4.0; 7.0)           | 7.0 (6.0; 10.0)               | 0.18  |
| ICU admission                           | 2 (14.29%)               | 12 (28.57%)                   | 0.47  |
| Invasive ventilation                    | 1 (7.14%)                | 8 (19.05%)                    | 0.42  |
| Dialysis                                | 0 (0.00%)                | 2 (4.88%)                     | 1.00  |
| HCQ treatment                           | 11 (78.57%)              | 1 (97.62%)                    | 0.06  |
| Length of stay in ICU (days), median (IQR) | 5.5 (1.0; 10.0)          | 15.0 (8.0; 23.5)              | 0.22  |
| Length of stay in hospital (days), median (IQR) | 6.0 (4.0; 10.0)          | 11.0 (5.0; 20.0)              | 0.11  |
| Mortality                               | 2 (14.29%)               | 8 (19.51%)                    | 1.00  |

CRP, C-reactive protein; IQR, interquartile range; LDH, lactate dehydrogenase; ICU, intensive care unit; HCQ, hydroxychloroquine.