Brief Report

Undocumented migrants during the COVID-19 pandemic: socio-economic determinants, clinical features and pharmacological treatment

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Abstract

Population groups such as undocumented migrants have been almost completely forgotten during the COVID-19 pandemic, though they have been living in all European countries for decades and new arrivals have continued throughout the pandemic. The aim of this study was to investigate their health conditions during the current pandemic. We analysed the records of 272 patients with respiratory issues attending the outpatient clinic of a large charity in Milan, Italy: amongst them, 18 had COVID-19 confirmed by rhino-pharyngeal swab and 1 of them deceased. All the patients attending the clinic appeared to have several risk factors for COVID-19 and chronic conditions suspected to predispose to the disease and/or to worsen severity and outcomes: hypertension, immunosuppression and previous close contact with COVID-19 patients were the most important ones. Presenting symptoms were worse in patients with COVID-19 than in those with other respiratory issues. These results are discussed in light of the necessity to provide better healthcare to undocumented migrants.

Introduction

As of 30th July 2020, total 17,109,335 cases and 668,801 deaths due to COVID-19 have been reported in 188 countries, with 3.9% case-fatality rate.[1] The global epidemic curve illustrates rapid onset and widespread transmission, with incidence still increasing. The pandemic is not yet over as September 2020, it remains ongoing and dynamic with transmission currently flaring up in countries that have been less impacted so far (*e.g.*, South America), resurging in countries that have a temporary decrease in infection rates (*e.g.*, China), and increasing in countries that have removed lockdown measures (*e.g.*, European countries as France and Spain). Vaccine development, production, distribution, and administration will take time to materialize and provide population-wide protection. A structured and coordinated approach is needed to address the ongoing global crisis.[2] Throughout the pandemic, many researchers have worked on the clinical and epidemiological aspects of the novel disease. The current evidence base shows that it disproportionately affects males, smokers, the elderly and patients with multiple underlying co-morbidities including chronic conditions such as hypertension.[3-5]

Both spreading speed and magnitude of the COVID-19 pandemic have put National Health Systems under unprecedented pressure; many of them have chosen to prioritize life-saving interventions for critically ill COVID-19 patients ahed of regular services (non-related to COVID-19). Notwithstanding this, the pandemic has resulted in high morbidity and mortality due to COVID-19 (primary impact) and displaced regular health service delivery with risk of health status deterioration due to causes other than COVID-19 (secondary impact).

Disproportionate impact on the elderly in long-term nursing homes has been documented[6] and undocumented migrants living in poverty in western countries have been identified as a high-risk population group due to underlying vulnerability to respiratory infectious diseases such as COVID-19, as a result of overcrowded dwelling conditions, inadequate water and sanitation facilities, under-nutrition, and elevated physical and psychological stress with multiple underlying co-morbidities *i.e.*, a well-established

Significance for public health

To our knowledge, this is the first study describing health conditions among undocumented migrants during the COVID-19 pandemic. Migrants are at higher risk of morbidity and mortality and represent an increasing share of total population in several countries, yet they have limited access to National Health Services. Knowing their conditions during an epidemic is fundamental both to assist them and to prevent the spread of the disease. Specific provisions for migrants need to be embedded systematically within overall emergency preparedness and response measures against COVID-19, to ensure adequate provisions for infection prevention and control, case finding and contact tracing, isolation and quarantine, and case management.

risk factor for increased mortality due to COVID-19.[7-9]

These risk factors are associated with limited access to healthcare due to legal, administrative, linguistic, social, and cultural barriers which pre-date the pandemic but are further exacerbated by the COVID-19 pandemic. Communication campaigns aimed at disseminating key messages on containment measures (*i.e.*, mobility and activity limitations, social and physical distancing, hygiene and decontamination) are mostly in national languages hence not easily accessible for those speaking other languages and designed according to social and cultural norms that may differ for migrants. Furthermore, isolation measures are challenging to implement for migrants living in overcrowded conditions, with inadequate water and sanitation facilities, without sufficient and stable employment and income sources.[10,11] Finally, such dwelling conditions are conducive to increased risk of infection transmission: institutional settings such as reception centers entail sharing rooms and communal spaces among guests and staff, as well as restrictions to individual mobility and activity;[12] informal settlements have inadequate water and sanitation infrastructure/facilities, are overcrowded, and health facilities within proximity tend to have limited capacity;[11] transit areas are by default unsanitary and populations on the move are the most exposed to health risks with the lowest access to services.

Overall, access to healthcare was already limited among migrants in such situation of vulnerability before COVID-19 pandemic and thereupon further decreased due to fear of becoming infected in health facilities, triage protocols requiring to contact family general physicians, and limited direct access to health facilities including Emergency Departments, hence additional barriers for undocumented migrants without a family general physician.[8]

The COVID-19 pandemic has exposed the negative effects of insufficient and inadequate coverage of primary health care among migrants, particularly those with precarious living situations and insecure status. Yet, health is a fundamental right that ought to be equitably accessed by every person.[15,16] In spite of this, very little has been done to solve this problem, with the exception of some spontaneous initiatives by not-for-profit organizations (NPOs) already involved in health care for the poor. We think that studying the patients followed by one of these organizations could give an insight into the social and health conditions of undocumented migrants during the COVID-19 pandemic.

Study population and methods

We analysed the records of 272 patients presenting with respiratory issues from February 24th to May 24th, 2020 at Opera San Francesco (OSF), the largest NPO providing healthcare to the poor in Milan, Italy. The vast majority of patients are undocumented migrants living in Milan and neighboring areas in Lombardy Region.

On February 18th, the first case of locally transmitted COVID-19 due to SARS-CoV-2 was diagnosed in Italy. Confinement measures were instituted and escalated over the following days and weeks, until reaching full-fledged lock-down status nation-wide, due to pandemic declaration by the World Health Organization on March 11th. Among these measures, a double-track pathway was designed to access health facility premises, with one track designated for possible COVID-19 patients (*i.e.*, individuals with respiratory symptoms, fever, and/or close contacts of confirmed cases) and one track designated for presumed non COVID-19 patients. OSF acted in the same way and since February 24th divided the outpatient clinics into two separate groups: one group for possible SARS-CoV-2 cases and one group for all other patients.

The patients included in this study represent the entire population seen in the clinic for possible COVID-19 cases over a period of three months, *i.e.*, since its opening February 24th until May 24th. For all patients, we obtained the following data, in addition to age, gender and country of birth: socio-economic conditions (employment and legal registration status); risk factors including unhealthy lifestyles, especially smoking,[2] impaired immunologic conditions, and close contact with confirmed COVID-19 cases; pre-existing chronic conditions (*e.g.*, hypertension, cardiac disease, diabetes and obesity) suspected to be associated with greater risk of susceptibility to SARS-COV-2 infection, and/or more severe COVID-19 morbidity, and/or higher risk of mortality due to COVID-19;[4,11,12] pharmacologic treatment prescribed upon consultation; diagnostic test (rhino-pharyngeal swab) results; outcome.

Variables with more than 10 missing values were excluded from the analysis of the association with COVID-19. Descriptive statistics were used to summarize patient characteristics. Continuous variables were reported as mean and standard deviations, while percentages were used for categorical variables. Continuous variables were compared between groups by using the t-test for independent samples. Differences on categorical variables between groups were tested by the Chi-square test for independence. Statistical analysis was performed with Analyse-it for Microsoft Excel Ver. 5.65/2020 (Analyse-it Software Ltd., Leeds, UK).

Results

During the study period, 272 patients attended OSF, including 144 (52.9%) males and 128 (47.1%) females. As shown in Table 1, our study cohort's mean age was 42.6 (±13.6) and 41.2 (±13.0) years in males and females, respectively (p=0.39). Overall, 43 patients had migrated from Africa, 37 from Asia, 155 from Latin America and 37 from Eastern Europe (*data not shown*); unfortunately, no information on the date of migration was available. Unhealthy lifestyles, particularly smoking, were significantly more frequent among males (p<0.0001), while the contrary was true for obesity (p=0.03) and arterial hypertension (p=0.03). The prevalence of type 2 diabetes (p=0.34) and cardiac diseases (p=0.95) did not differ significantly between males and females. In general, it appeared that risk factors for COVID-19 were highly represented in this population. No data are available, at the moment, for the overall rates among the poor population in Italy.

Table 1. Differences in risk factors and chronic conditions between males and females of the study cohort.

	M (n=144)	F (n=128)	p
Age (years, mean ±SD)	42.6±13.6	41.2±13	0.39
Risky behaviors (%)	43.8	14.1	<0.0001
Smoking (%)	30.6	11.3	<0.0001
Obesity (%)	50.6	67.0	0.03
Hypertension (%)	27.0	39.8	0.03
Diabetes (%)	24.8	30.1	0.34
Cardiac diseases (%)	14.8	14.5	0.95

Presenting symptoms are shown in Figure 1. Respiratory symptoms and fever were the most common complaints that induced patients to seek medical assistance. The mean peripheral arterial oxygen saturation was 97.6±1.9 % (range: 85-100%).

They were prescribed mainly symptom relievers such as paracetamol (61 patients; 22.4%) and antihistamines (27 patients; 9.9%); 56 patients (20.6%) received oral antibiotics.

Eighteen patients (6,6%) had a positive swab for SARS-CoV-2 genome. One patient, among those who tested positive for COVID-19 (with AIDS co-morbidity) died. In addition, we suspected 16 more patients (5.8%) to have the disease, based on presence of one or more criteria as per case definition. Unfortunately, we could not obtain the results of their rhino-pharyngeal swab.

Positive patients included 11 males (61.1%) and 7 females (38.9%), with a mean age of 44.4±15 years. Twelve were Latin-Americans, 3 Africans, 2 East Europeans and 1 Asian. Five patients were homeless (2 sleeping in a dormitory). The mean number of persons sharing accommodation with the patients was 2.1±1.8.

The number of patients with confirmed COVID-19 was small, as compared to the rest of the population, therefore the results of statistical analysis should be considered with caution. However, we found that an association existed with some predisposing factors. As shown in Table 2, among chronic co-morbidities, the association with hypertension was significant. In a simple logistic regression model, hypertension was a significant predictor of COVID-19 (OR 1.66; 95% CI 1.02-2.69; p=0.04). Four of the 10 hypertensive COVID-19 patients were on either Angiotensin Converting Enzyme Inhibitors (ACE-I) or Angiotensin Receptor Blockers (ARB).

Among risk factors, previous close contact with COVID-19 cases appeared to be the most important; immunosuppression was also significant. Presenting symptoms more frequently associated with COVID-19 were dyspnea (p<0.0001), fatigue (p<0.0001), temperature over 37.5°C (p<0.0001), rhinitis (p=0.03), and cough (p=0.02). Peripheral oxygen saturation was significantly lower in patients with COVID-19: 95.6%±3.4% *vs* 97.7%±1.8% (p=0.0005).

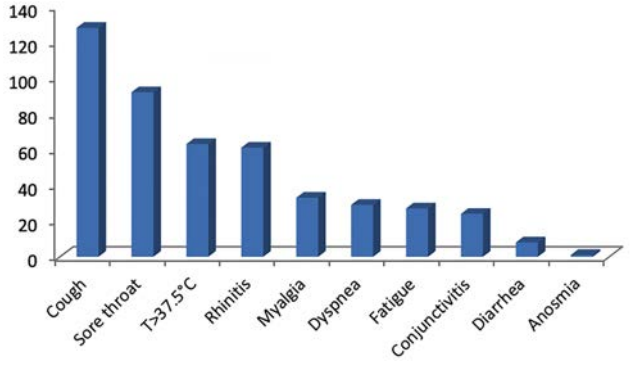

Figure 1. Presenting symptoms (percentage of subjects) in the study cohort.

Table 2. Predisposing factors in the 18 patients with confirmed COVID-19. For COVID-19 negative patients the total number is not always 254 because of missing values.

	COVID +		COVID -		p
	Y	N	Y	N	
Male sex	61.1	38.9	52.3	47.7	0.47
Hypertension	55.6	44.4	31.3	68.7	0.04
Diabetes	33.3	66.7	27.1	72.9	0.55
Smoking	22.2	77.8	20.9	79.1	0.89
Contacts with positives	44.4	0*	31	125°	<0.0001
Immunodepression	11.1	88.9	6	247	0.04
Persons living with the patient	2.1±1.8		3.1±2.0		0.06

*Does not know = 55.6; °does not know = 98.

Discussion

In the present study, we describe the characteristics of a population of undocumented migrants seeking medical assistance for respiratory problems during the COVID-19 pandemic.

We are aware that our work has limitations. First, the study is health facility-based rather than population-based. Therefore, the study provides information only about those migrants who presented at the health facility, while it does not provide a true picture of the actual magnitude, characteristics, and patterns of SARS-CoV-2 transmission and COVID-19 morbidity and mortality among migrants (selection bias). This is particularly important because as much as 80% COVID-19 cases may be non-severe (*i.e.*, mild, pauci-symptomatic, asymptomatic), hence may not present at a health facility to seek care therefore ending up missed-out by epidemiological surveillance and health care systems. Second, the study captures a small-size population (total 272 patients) seeking and accessing health care at a single health facility (OSF clinic in Milan, Italy). Therefore, observations are too few to allow for meaningful stratification and statistical analysis, and results are not representative and cannot be generalized to the overall migrant population, who tends to be highly heterogeneous. Third, the study site (OSF clinic in Milan, Italy) mostly provides healthcare to undocumented migrants, *i.e.* a further specific migrant population, who may have behaved differently during lockdown, compared to the general population and to the documented migrant population, respectively. As a matter of fact, undocumented migrants may have refrained from seeking healthcare for fear to be spotted and expelled from Italy. This could have reduced the population size of our study sample and of COVID-19 positive patients. Lastly, we could not obtain 16 (47%) test results of rhino-pharyngeal swabs over total 34 patients suspected to have COVID-19, due to various reasons (such as refusing to undergo the test or to comply with follow-up). We are aware that 16 more positive cases out of 34 could have made a change near to 100%. However, this cannot be considered an epidemiologic study, since it is impossible to know the exact number of undocumented migrants living in Lombardy. Therefore, no inference on prevalence and incidence can be made. The aim of our study is only to begin to drive attention onto a population escaping every other form of investigation. It is important to underline that we used the same tests implemented for the general population both in Italy and other European countries, whose sensitivity and specificity are known.[17] In this way we avoided a potential methodological bias.

With these limitations, some points are worth discussing. First, this population, though relatively young, had a significant burden of risk factors and chronic conditions that are associated with worse prognosis due to COVID-19.[3,5,15,16] Chronic conditions

were unevenly distributed between men and women, *i.e.* an observation that we have already made earlier.[18] Among these conditions, hypertension seemed to be more frequent in COVID-19 patients, as reported by others too.[5] Of course, in consideration of the small number of COVID-19 patients with hypertension in our study, we cannot draw conclusions on treatment with ACEI and ARB. However, though their potential role has widely been debated,[19] it has now been demonstrated that there is no evidence that they affect the risk of COVID-19.[20] The small number of positive patients (due to the small sample size) could also be the reason why we did not find an association with other conditions such as smoking, which can increase both infection risk and disease severity.[21,22]. For obesity, whose role is still unclear,[16] we have no information from our study. This variable, which contained more than 10 missing values, was not analyzed.

Also for immunosuppression, either caused by disease or therapy, which is a well-known predisposing factor for COVID-19[23] we had to few patients in such condition to allow a reliable statistical analysis.

The high number of Latin Americans among COVID-19 patients almost surely reflected the high percentage of this ethnicity in the population of the study, which may be over-represented (hence an additional selection bias and study limitation).

Interestingly, the COVID-19 patients in our study had worse-presenting symptoms than patients with other causes of respiratory disease. Therefore, severe symptoms, the presence of chronic conditions as hypertension and risk factors such as immunosuppression and previous close contacts with COVID-19 positives can help to distinguish the patients in whom a diagnostic test (rhinopharyngeal swab) is more needed on priority basis. This is not a superfluous observation since currently NPOs must rely on hospital Emergency Departments and overall access to diagnostic tests remains limited. More in general, our study demonstrates and confirms that undocumented migrants are a high-risk population for COVID-19, perhaps even more than other population segments, due to underlying socio-economic vulnerability, health risks and barriers to accessing healthcare. This segment of population is excluded from the picture of the background situation in the region regarding COVID-19 infection rates.[24].

Though receiving less media attention, migrant and refugee flows have remained ongoing throughout the COVID-19 pandemic and have increased after lockdown measures were lifted. For instance, irregular arrivals in Europe were more than 28,000 from January 1st to June 15th 2020.[25] Nonetheless, there is a lack of specific and systematic provisions for migrant populations in context of COVID-19 and cases are managed through *ad hoc* solutions, mostly through spontaneous initiatives by local NPOs or quarantine ships in case of sea arrivals, thus resulting in limited effectiveness of strategies to contain COVID-19 and unnecessary burden of disease. In June 2020, the European Center for Disease Control issued specific guidance for migrants in context of COVID-19,[12] yet these have not been translated into national and local measures so far. Based on these observations, migrants and refugees risk to fall in between the cracks of COVID-19 emergency preparedness and response. As the pandemic remains ongoing and further spread is possible, there is a persisting risk of cases going untimely detected and treated thus contributing disproportionately to morbidity and mortality. Therefore, specific and systematic measures are needed to adequately extend coverage of epidemiological surveillance and healthcare systems and services in this population. There are three reasons for this. The first is human right-based (it is not ethical to exclude individuals and/or groups from health care, which is a fundamental human right). The second concerns Public Health, to increase effectiveness of infection prevention and control measures. The third has clinical relevance, since it is possible that COVID-19 causes important permanent pulmonary damage.[26]

Failing to take action could risk "bad policy at high cost".[27]

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Key words: COVID-19; undocumented migrants; chronic diseases; drugs prescription.

Contributions: GF, SGC, designed and supervised the study and wrote the manuscript; CG, MA, EC, collected the data; MF, helped with statistical analysis; AER, MF, GC, EG. contributed to the interpretation of data and revised the manuscript.

Funding: This work was supported by grants from the Italian Ministry of Education, University and Research ('PRIN' 2017, project 2017728JPK).

Conflict of interest: The authors declare no potential conflicts of interest.

Ethics approval and consent to participate: Since the study is retrospective, an authorization protocol number by the local ethics committee was not required. All data were completely and permanently anonymized. All procedures were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Availability of data and materials: The data used to support the findings of this study are available from the corresponding author on reasonable request.

Received for publication: 2 July 2020.
Accepted for publication: 11 November 2020.

Journal of Public Health Research 2020;9:1852
doi:10.4081/jphr.2020.1852

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