



Cross-sectional study of SARS-CoV2 clinical characteristics in an immigrant population attended in a Hospital Emergency Department in the Catalunya Health Region in Spain

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ABSTRACT

Aim: The COVID pandemic has been the biggest health challenge faced in decades. The aim of this study is to assess the characteristics of immigrant patients who attended a Hospital Emergency Department during the first three waves of the coronavirus pandemic.

Methods: A retrospective, descriptive study of immigrant patients treated in a Hospital Emergency Department between March 15 and November 30, 2020. A descriptive analysis and a comparative analysis were carried out according to place of origin, gender and age. For the comparative analysis, the chi-square test for qualitative variables was used. For the comparative analysis according to gender, Student's t test or the Mann-Whitney U test was used for normal or non-normal quantitative variables, respectively. The Kruskal-Wallis test was used for normal or non-normal quantitative variables according to age.

Results: We have analyzed 633 immigrant patients who visited the emergency department during the study period. Of the sample, 50.1% patients were women and 78% of all patients came from Africa. The mean age of the patients was 44.1 years. Most patients (72.5%) were discharged to home after evaluation in the emergency department, especially European patients. One-quarter of patients required social resources to be able to comply with quarantine measures, of whom 87% were African. Forty-seven percent of patients became infected at home and 41% in the workplace.

Conclusions: The immigrant population is generally younger and less infected than the population at large. In addition, the use of social resources to guarantee patient isolation has often proved essential in controlling outbreaks that have arisen in these communities.

Background

The COVID pandemic has been the biggest health challenge faced in decades. Our health region is one of the few in Spain that have suffered a higher number of cases than other regions.

After the lifting of mobility restriction measures implemented during the first lockdown, there was a rapid recovery of social activity linked to the seasonal hiring of people to work in the region's agro-food sector. In fact, Lleida was the only region in Catalunya, that suffered two lockdowns in less than six months.

The coronavirus pandemic has been described as having accentuated health inequalities, especially among the immigrant population (Okonkwo et al., 2020 Jun 3). Structural changes should be considered (Clark et al., 2020 Jul 13) to reduce inequalities and reduce the costs

suffered by the immigrant population during the various epidemic outbreaks. In fact, in the United States and Canada there has been a call to awareness (Mia and Griffiths, 2020 Sep) of the effects that COVID can have on a vulnerable population such as immigrants. However, in Lleida province few studies have been carried out in this population group.

In Europe (Kuhlmann et al., 2020 Sep 1), a recent review explored the situation of long-term migrants and the disruptions caused by COVID. In addition, this review revealed the shortcomings of the labor market in respect of this population, whose effects on our region we verified in the second wave of the disease. The COVID pandemic has revealed that these conditions impact the population's health and well-being, thus becoming a public health problem.

In Catalunya, in 2019 we had an immigrant population of 15% (Catalan Statistics Institute 2020). Among them, 20% came from Morocco, followed by Romania (7.7%), and China (5.36%). 48.6% were

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women and 63.7% were under 40 years of age. Although the province of Barcelona concentrates 70% of the immigrant population, it accounts for 15% of the total Catalan population. In the province of Lleida, the immigrant population accounts for about 19% of the total population. However, during summer months, between 10,000 and 30,000 people arrive in the province to work at different agriculture holdings.

The figures are similar for Spain as a whole. The immigrant population accounts for 11.4% of the total population, with an average age of 36 years, and 49.8% women. Fifteen nationalities account for almost 75% of all foreign residents in Spain. Eight of them correspond to countries of the European Union, among which Romania, the United Kingdom and Italy stand out.

Among the most numerous groups from countries outside the EU are the nationals of Morocco, China, Venezuela, and Ecuador, all of them with over 145,000 residents in Spain each (Ministry of Migrations 2020).

In many patients, coronavirus infection can be asymptomatic or present mild symptoms (Kim et al., 2020 Jul), especially in younger subjects without risk factors. This is very important, because the immigrant population in our country (Gimeno-Feliu et al., 2019 Feb 28) is generally young and healthy. Moreover, the priority of this population is to work, and in many cases they minimize the severity of their symptoms to avoid being forced to take sick leave. In Catalunya, 71% of temporary workers in the agricultural industry are immigrants. This percentage is lower in other Spanish autonomous communities with major primary industries. In Murcia, 54% of temporary workers are immigrants, in Valencia the figure stands at 42%, and in Andalucía, 15%. This has been very important in controlling outbreaks of COVID associated with immigrant communities. In addition, the hygienic-dietary conditions of this group of people make it difficult to implement quarantining.

We proposed this study to assess the characteristics of the patients who attended a Hospital Emergency Department during the first three waves of the coronavirus pandemic.

Methods

A retrospective, descriptive study of immigrant patients treated in a Hospital Emergency department between March 15 and November 30, 2020. Our hospital is the only public hospital that attends to general emergencies with an area of influence of 300,000 people.

Variables

Sociodemographic variables were collected from all patients, especially their country of origin. We have also studied clinical variables such as duration of symptoms, laboratory results, and disease severity scores. We have also evaluated destination at discharge, treatment at discharge and re-consultation at 48 hours and 7 days after the first attention.

Inclusion criteria

All immigrant patients treated by the emergency department due to respiratory symptoms or disease associated with coronavirus were included, as well as all patients who came to the emergency department for another reason and underwent PCR control, testing positive. "Immigrant patients" were defined as persons who did not have Spanish nationality and did not have a Catalan Health Identifier at the time of the study.

Statistical analysis

A descriptive analysis and a comparative analysis were carried out according to origin, gender and age. For the descriptive analysis, absolute and relative frequencies were used to summarize the qualitative variables and means and standard deviations or median and interquartile range for the normal or non-normal quantitative variables, respectively. For the comparative analysis, the chi-square test for qualitative

variables was used. For the comparative analysis according to gender, Student's t test or the Mann-Whitney U test was used for normal or non-normal quantitative variables, respectively.

For the comparative analysis according to origin and according to age (four categories), the analysis of variance or the Kruskal-Wallis test was used for normal or non-normal quantitative variables, respectively. If significant differences were observed according to origin or age groups, the differences between pairs of groups were analyzed adjusting by the Tukey method or the Benjamini & Hochberg method for normal or non-normal variables, respectively.

Statistical analysis was performed using the R program (Core Team, 2020) and considering statistical significance when $p < 0.05$.

The study was approved by the Research Ethics Committee of the Lleida Biomedical Research Institute, assigned with the code 2020/2531.

Results

We have analyzed 633 immigrant patients who visited our hospital's emergency department during the study period. Of the sample, 50.1% were women and 78% of all patients came from Africa. The mean age of the patients was 44.1 years. Asian patients were by far the oldest patient group.

Of patients that had previously consulted due to manifesting COVID symptoms (40.3%), patients from America had previously contacted the least and took longest to consult ($p < 0.05$). 30% of patients had been referred by their family doctor. Table 1 sets out a summary of patient characteristics depending on area of origin.

Regarding COVID risk factors, 21% presented high blood pressure and 23% were clinically obese. Less than 10% of patients had a history of lung disease, diabetes and smoking habit.

Regarding the clinical characteristics of COVID, the majority did not present respiratory distress. However, 54.7% of the sample had pathological radiological evidence. Asian patients were the most severely affected, with elevated inflammatory markers and more significant lymphopenia. Treatment characteristics are shown in Table 2.

Most patients (72.5%) were discharged to home after evaluation in the emergency department, especially European patients. 25% of patients required social resources to be able to comply with the quarantine measures. 87% of the patients who needed social resources were of African origin. 5.37% of the patients sought assistance for second time within 48h of their first visit.

197 patients were able to identify where they had been infected. In 47% of cases, patients were infected at home, while in 41% of cases infection took place at the workplace, as shown in Table 3.

Regarding gender, female patients were younger (41.8 years compared to 46.2 years for men) and more obese ($p < 0.05$). However, they required fewer hospitalizations than male patients.

If we analyze age-dependent differences, older patients (> 60 years) had higher risk factors and worse clinical markers. However, the majority were discharged to home and were the patients most in need of social resources upon discharge.

Discussion

This is the first study to describe the clinical characteristics of patients with SARS-CoV2 in our country, and one of the first in Europe. Our study shows that immigrant patients infected with COVID-19 were young and were mostly discharged to home. Older patients, despite having higher risk factors, were discharged to home. Immigrant patients accounted for 17% of the patients treated by the Emergency department for coronavirus.

72.5% of the immigrant patients were discharged to home. Immigrant patients who consulted for COVID presented milder symptoms

Table 1
Clinical and sociodemographic characteristics.

VARIABLES	TOTAL	Europe	Asia	Africa	America	p. overall	N
Men	316 (49.9%)	30 (57.7%)	2 (66.7%)	251 (50.3%)	33 (41.8%)	0.283	633
Women	317 (50.1%)	22 (42.3%)	1 (33.3%)	248 (49.7%)	46 (58.2%)		
Age	44.1 [14.5;88.5]	46.2 [16.0;88.5]	61.0 [33.8;68.0]	43.0 [14.5;75.2]	48.9 [24.0;85.0]	<0.001	633
Previous visit	230 (40.3%)	14 (32.6%)	0 (0.00%)	200 (43.8%)	16 (23.5%)		
Duration of symptoms prior to consultation	4.00 [0.00;30.0]	5.00 [0.00;30.0]	5.00 [0.00;5.00]	4.00 [0.00;30.0]	6.00 [0.00;21.0]	0.023	633
Referred by GP	190 (30.0%)	17 (32.7%)	1 (33.3%)	149 (29.9%)	23 (29.1%)		
Risk Factors							
Hypertension	134 (21.2%)	16 (30.8%)	1 (33.3%)	100 (20.0%)	17 (21.5%)		
Respiratory Diseases	38 (6.00%)	5 (9.62%)	0 (0.00%)	31 (6.21%)	2 (2.53%)		
Obesity	122 (23.7%)	11 (21.6%)	1 (50.0%)	92 (24.0%)	18 (23.4%)		
Smoker	38 (6.05%)	7 (13.5%)	0 (0.00%)	27 (5.47%)	4 (5.06%)		
Diabetes	69 (10.9%)	4 (7.69%)	1 (33.3%)	52 (10.4%)	12 (15.2%)		
Clinical characteristics							
MuLBSTA score	5.00 [0.00;15.0]	5.00 [0.00;9.00]	13.0 [13.0;13.0]	5.00 [0.00;15.0]	5.00 [0.00;15.0]	0.357	351
SpFI	462 [152;495]	462 [298;471]	. [..]	462 [152;495]	462 [419;471]	0.355	229
PAFI	352 [128;695]	457 [207;529]	462 [462;462]	343 [128;576]	405 [145;695]	0.008	209
Pathologic X Ray	321 (54.7%)	40 (78.4%)	2 (66.7%)	226 (49.5%)	53 (69.7%)		
Pathologic lung ultrasound	43 (13.7%)	2 (6.25%)	0 (0.00%)	31 (13.5%)	10 (19.6%)		
Blood test performance	463 (73.5%)	44 (84.6%)	1 (33.3%)	349 (70.4%)	69 (87.3%)		
D Dimers	150 [51.0;13684]	192 [150;13684]	358 [150;567]	150 [150;12309]	163 [51.0;1722]	0.171	449
PCR	35.0 [0.12;446]	48.9 [2.00;266]	98.0 [98.0;98.0]	29.8 [0.12;446]	52.8 [2.00;273]	0.208	437
Absolute Lymphocytes	1230 [230;4530]	1210 [320;4530]	520 [520;520]	1260 [230;4449]	1150 [340;3560]	0.364	457

Table 2
Treatment administered.

	TOTAL	Europe	Asia	Africa	America	p. overall	N
Hydroxychloroquine	47 (7.42%)	5 (9.62%)	0 (0.00%)	36 (7.21%)	6 (7.59%)	0.783	633
Heparin	244 (38.5%)	13 (25.0%)	0 (0.00%)	210 (42.1%)	21 (26.6%)	0.003	
Dexamethasone	92 (14.5%)	5 (9.62%)	0 (0.00%)	76 (15.2%)	11 (13.9%)	0.751	
Other treatments	263 (41.5%)	10 (19.2%)	0 (0.00%)	239 (47.9%)	14 (17.7%)	<0.001	

Table 3
Destination at discharge.

	TOTAL	Europa	Asia	Africa	America	p. overall	N
Destination at discharge							
Home	459 (72.5%)	45 (86.5%)	3 (100%)	345 (69.1%)	66 (83.5%)	0.017	633
Social Resource	158 (25.0%)	7 (13.5%)	0 (0.00%)	138 (27.7%)	13 (16.5%)		
Hospital	16 (2.53%)	0 (0.00%)	0 (0.00%)	16 (3.21%)	0 (0.00%)		
Identify contacts	174 (27.5%)	11 (21.2%)	0 (0.00%)	147 (29.5%)	16 (20.3%)		
Family scope of contagion	93 (47.2%)	3 (20.0%)	0 (.)	80 (49.7%)	10 (47.6%)	0.099	197
Social scope of contagion	21 (10.7%)	2 (13.3%)	0 (.)	15 (9.32%)	4 (19.0%)		
Work scope of contagion	83 (42.1%)	10 (66.7%)	0 (.)	66 (41.0%)	7 (33.3%)		
2nd visit in <48h	34 (5.37%)	1 (1.92%)	0 (0.00%)	27 (5.41%)	6 (7.59%)		633
2nd visit within 7 days	36 (5.69%)	0 (0.00%)	0 (0.00%)	32 (6.41%)	4 (5.06%)		633
More than 2 visits in the same period	59 (9.32%)	0 (0.00%)	0 (0.00%)	55 (11.0%)	4 (5.06%)	0.014	633

than the rest of the population. As we expected, our sample is a healthy population without risk factors, since lung diseases and diabetes did not exceed 10% of the sample, and hypertension and obesity were only present in 20% of cases. Women required fewer hospitalizations, which also occurred among the general population.

Regarding destination upon discharge, 25% of immigrant patients required social resources to be able to complete quarantine and isolation from their contacts and partners. These centers, known as *Hotel Salut*, or Social Quarantine Centers, have been fundamental in controlling the epidemic, especially in the summer months.

At these centers, co-managed by public administrations and health authorities, patients who could not guarantee adherence to quarantine could be admitted there, where they were provided with food and received medical supervision.

A study conducted in Madrid (Jaqueti Aroca et al., 2020 Aug) has revealed differences depending on the country of origin. Said study reflected little involvement of African and Asian patients, which does not coincide with our results. Another study in our country (Amengual-Moreno et al., 2020 Sep 16) has detected significant differences in the

incidence of infection by the immigrant population, however, linked to the neighborhood where they reside, with patients from Maghreb presenting the highest incidence.

A recently published study showed that the Latin population had a higher risk of hospitalization (Zaeh et al., 2021 Jan). In our study, patients from America took longest to visit the emergency department and consulted their primary care doctor the least. However, a Norwegian study (Indseth et al., 2021 Feb) showed that those who most required hospital admission were Africans. Another study (Guijarro et al., 2020) showed an increased risk of COVID in African and Latin American patients in our country.

Patients consulted the emergency department on the fourth day of manifesting symptoms, which is similar to the rest of the population. However, once attended, the re-consultation rate was 5.3%, probably because the majority of patients had mild symptoms and did not present complications.

In our study, there was a clear predominance of African patients, so it is logical that they presented with the worst complications and recorded the highest rates of admission. Interestingly, our study includes

few Asian patients. However, they presented greater comorbidity, although they did not require admission.

We also believe it is significant that infection occurring in the workplace was reported in 41% of cases, and we believe that the real percentage is likely higher since on many occasions it was not possible to obtain this data set. We hope and expect that in the coming months measures can be implemented to prevent contagion in the workplace, thus making it safer.

The main limitation of our study is that we have not been able to carry out a prospective study on this patient group. Some data, especially clinical, have not been possible to record, and neither was it possible to collect more variables, related to the time spent living in the country, household details and social and health conditions at home. Furthermore, the lack of bibliography in our country makes it difficult to compare results.

The SARS-CoV2 pandemic has highlighted two main social gaps in our country. In the first wave, elderly people living in residencies were the main focus of contagion. In the second wave, in our region we were aware of the poor social and health conditions of temporary immigrant workers.

The main recommendation after reviewing our data is the importance of establishing social resources to guarantee the accomplishment of quarantining and avoid high concentrations of people in the same household. Moreover, local policymakers and stakeholders should be involved to ensure that only regularized immigrants come to work in the agricultural sector during the summer. Moreover, specific strategies should be planned for people who come in the hope of finding a job whose expectations are not met. Situations involving hundreds of irregular immigrants waiting in public places without wearing masks must be avoided. If we cannot prevent the arrival of immigrants, we must ensure dignified places for them to stay in and give them solutions to control the situation.

The conclusion of our study is that the immigrant population is generally younger and less infected than the population at large (Casas-Rojo et al., 2020 Nov). In addition, the use of social resources to guarantee the isolation of patients has been essential to control outbreaks that have arisen in these communities. We hope that with the information obtained, adequate planning can be implemented to be able to solve the hygienic conditions of the homes of people who come seasonally to work in our region and that there is a commitment to make the workplace safe.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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