OR 7737 inglés

Hepatitis C in homeless people: reaching a hard-to-reach population

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Received: 18/12/2020
Accepted: 07/01/2021
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Conflict of interest: the authors declare no conflict of interest.

ABSTRACT
Objective: the aim of this study was to analyze the process of detection and treatment of hepatitis C in individuals experiencing homelessness (IEH).

Methods: an analytical cross-sectional study was performed in a Primary Care center. The center screened and registered patients with a positive hepatitis C antibody test and referred them to the Digestive Service.

Results: finally, 8.3 % presented with a positive HCV antibody test, of which six were patients who had already received treatment. Of those who had not received treatment, one patient was successfully treated; 30.8 % of the total could not be
located or did not wish to participate.

**Conclusion:** community coordination and the use of rapid tests would improve detection.

**Keywords:** Homeless people. Homelessness. Hepatitis C virus. Social exclusion. Poverty.

**INTRODUCTION**

One of the World Health Organization’s goals is the elimination of viral hepatitis in Europe by the year 2030 (4). Individuals experiencing homelessness (IEH) are at a higher risk of infection with the hepatitis C virus (HCV) (1), with rates of 4 to 36 % (2), which is well above the Spanish average of 1.7 % (3). In Spain, the national health system’s Strategic Plan for the Management of Hepatitis C (*Plan Estratégico para el Abordaje de la Hepatitis C*) has made it possible to treat more than 140,000 patients since 2015 (5). Given the simplicity and efficacy of new treatments, the incidence and complications derived from chronic HCV infection have decreased (6). At present in developed countries, hepatitis C is concentrated in hard-to-reach populations, such as IEH.

The aim of this study was to describe the process of detection and treatment of HCV infection in IEH in Girona and to analyze the factors that contributed to or hindered the intervention.

**METHOD**

**Study design**

An analytical cross-sectional study was performed with an IEH study population in the city of Girona, between June and November 2019. The six-month study included all the IEH who visited Girona’s municipal homeless shelter. The final sample included 133 IEH.

**Procedure**
In May 2019, the Hepatitis-C Hospital Unit (H-CHU) contacted the referral Primary Health Care Centre (PHCC) of Girona’s municipal IEH shelter to detect those infected with HCV. First, the HVC status and sociodemographic status of the sample was determined and their medical records were reviewed. Second, those with a recent negative HCV antibody test were distinguished from those with a positive result or with no test result. The IEH who tested positive for HCV and with a high viral load were referred to the H-CHU. Those without a blood test were offered one and were referred to the PHCC. Specialized teams involving outreach workers, shelter employees and the PHCC supervised the follow-up, compliance and final result of the treatment.

**Ethical considerations**

This research is subject to the ethical standards of the Declaration of Helsinki. The participants were verbally informed of the study and gave their consent for the use of their data anonymously and confidentially, for research purposes.

**Statistical analysis**

Measures of central tendency and dispersion were used for the description of quantitative variables, and absolute and relative frequencies for the qualitative variables. The Student’s t-test was used to compare means, the Mann-Whitney U test for independent samples according to normality, and the Chi-squared test for categorical variables. A binary logistic regression analysis with diagnosis as the dependent variable was adjusted to determine the predictive variables of a positive diagnosis.

**RESULTS**

Of the 133 cases included in the study, 80.5 % were male (n = 107) and 19.5 % were female (n = 26). The mean age was 45.4 years (SD = 13.1) and no age differences were found according to gender (male = 44.8 years, SD = 13.3; female = 47.6 years, SD = 12.1; t = 0.96; gl = 131; p = 0.339).
The review of the subjects’ medical records showed that 69 IEH (51.9 %) were HCV negative. Of the remaining 48.1 % (n = 64), eleven cases were confirmed HCV positive. Of the eleven positive cases, six had previously received treatment and had an undetectable viral load. Of the remaining five, one case was successfully treated, and the other four either could not be located or did not wish to be treated.

Of the 53 without a recent laboratory test (39.8 % of the total sample), 12 were located and were all found to be HCV negative. Therefore, 41 could not be tested because they could not be located or did not wish to participate. Of the total sample, the total number of positive HCV antibody tests was eleven (8.3 %) and the detection of a positive viral load was one case (0.8 %) (Fig. 1).

No gender or age differences were found regarding the diagnostic status of the total sample (Table 1). However, when only those cases which could be tested were included in the analysis (n = 92), we found that HCV positive individuals were older than HCV negative (positive = 53.4 years; SD = 8.5 vs negative = 44.2 years; SD = 12.5; Mann-Whitney U = 5.58; gl = 1; p = 0.02).

The binary logistic regression analysis found that older age was a predictor of a positive HCV antibody test (Table 2).

**DISCUSSION**

The results of this study show that although the majority of IEH have a negative HCV antibody test, the number of positive cases reported was almost five times higher than for the general population (8.3 % vs 1.7 %, respectively) (3). Of the positive cases, nearly half could not be treated due to the fact that the participants could not be located or did not agree to participate. Thus, there was a significant number of lost cases. This indicated the notable difficulties to carry out the follow-up and treatment of the cases.

A study carried out in Dublin in 2017 screened 597 IEH (7) and found that 199 (33.3 %) had a positive HCV antibody test. These were offered treatment and only two complied with it successfully. Another study from Girona showed a positive HCV rate of 11.7 % (8). Both studies presented a higher rate than that found in our study, a fact which may be due to the decrease in transmission and incidence thanks to the efficacy
of the new treatments introduced in the three intervening years.

IEH possess unique characteristics that must be taken into account in future interventions. Homelessness and marginal housing are considered to be contraindications for HCV treatment as they hinder the success of the intervention (9). Having spent the night in a shelter before a treatment has been found to increase adherence and success rates (10). Coordination between social services and health services improves accessibility and compliance with treatment.

It was not possible to perform a high percentage of blood tests in this study. This was partly due to the difficulties involved with locating the participants. Other challenges for this population are the fact that health centers perform blood tests in the early morning, individuals are required to remain in the waiting room until the extraction and they need to share the space with other patients while adhering to certain rules of conduct. The use of a rapid saliva-based antibody test that could be performed on the street would help to improve detection.

The number of infected patients who managed to complete the treatment was also low, despite the simplicity of current treatments and the infrequent hospital follow-up they require. Care coordination between GPs and other medical specialists, including mental health services, is necessary for the management of IEH patients (11). Therapeutic compliance should also be improved by facilitating the dispensing of antivirals in health centers (12,13), directly observed therapy (14) and supervision by teams of social workers/educators on the street.

The benefits of information and communication technology, eHealth, mHealth and telemedicine, which have been shown to improve adherence to treatment among IEHs should not be ignored (15).

REFERENCES

2. Fazel S, Geddes JR, Kushel M. The health of homeless people in high-income countries: descriptive epidemiology, health consequences, and clinical and policy


Table 1. Differences in diagnostic status after the intervention, according to sociodemographic variables

<table>
<thead>
<tr>
<th>Diagnostic status</th>
<th>Values</th>
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<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td>Not tested</td>
<td>$X^2/F$</td>
<td>gl</td>
<td>p</td>
</tr>
<tr>
<td>Sex, n (%)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Male</td>
<td>10 (9.3)</td>
<td>61 (57.0)</td>
<td>36 (33.6)</td>
<td>3.54</td>
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<tr>
<td>Female</td>
<td>1 (3.8)</td>
<td>20 (76.9)</td>
<td>5 (12.2)</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>11 (8.3)</td>
<td>81 (60.9)</td>
<td>41 (30.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, M (SD)</td>
<td>53.4 (8.5)</td>
<td>44.2 (12.4)</td>
<td>45.6 (14.7)</td>
<td>2.44</td>
<td>2</td>
<td>0.91</td>
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Table 2. Binary logistic regression analysis with the dependent variable diagnostic result hepatitis-C virus (Cox and Snell R-square = 0.059; Nagelkerke R-square = 0.115)

<table>
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<tr>
<th></th>
<th>B</th>
<th>Standard error</th>
<th>Wald</th>
<th>gl</th>
<th>p</th>
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<td>Constant</td>
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<td>1.593</td>
<td>10.84</td>
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<td>Age</td>
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<td>0.030</td>
<td>4.933</td>
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Fig. 1. Sample.