Hepatitis C Virus (HCV) Epidemiology, Diagnosis, and access to treatment in a UK Cohort

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Introduction

The WHO estimates that 71 million people worldwide have chronic HCV infection with 0.4 million people dying each year from their infection. Up to 85% of infected patients may be unaware of their infection, and a minority of those diagnosed receive treatment.28

Diagnosis of HCV is based on a 3-fold approach to testing:
1. Detection of HCV IgG by ELISA (no discrimination between acute and previous infection)29
2. Detection of HCV core antigen (HCV-Ag). Diagnostic of active infection and improved specificity compared to HCV-Ab.
3. Detection of HCV RNA by PCR (gold standard, but not financially viable in resource poor settings)

Up until 2014, detection of HCV-Ag was widely used to estimate seroprevalence. However, this method detects cleared infection, has inter-assay variability and false positive results associated with various factors such as ethnicity, ESR, auto-antibodies and prostatic devices.30 There has been a move towards using HCV-Ag and/or HCV PCR to accurately determine population prevalence although there are doubts as to the sensitivity of HCV-Ag as a primary screening tool and WHO guidelines still recommend HCV-Ab as the first line test.31

We here set out to look at the performance of several diagnostic tools in a UK tertiary referral hospital. We reviewed the performance of the local HCV testing protocol in 2 different time periods:
- When HCV antibody screening alone was available
- After the combined Ab/Ag test was introduced

We collated these results alongside HCV RNA detection to describe the local epidemiology, and reviewed the proportion of individuals with a diagnosis of HCV who are referred onto hepatitis sites. This is part of an ongoing local effort on HCV surveillance and treatment.32,33

Methods

The laboratory involved handles samples from a wide community as well as four hospital inpatient sites. We retrospectively looked at all HCV screening tests performed within two time intervals in which different diagnostic algorithms were operating (figure 1):

Group 1 (Jan 2013 - June 2014)
Samples screened for HCV-Ab only using an automated immunoassay. Positive results were sent to the reference laboratory for confirmation using two further ELISA tests, and those confirmed positive were then tested for HCV RNA.

Group 2 (Jan 2015 - March 2016)
HCV diagnosis using combination of HCV Ab/Ag testing. HCV Ag positives were classed as those in range 10-20,000 fmoI/L.

Results

38,510 HCV tests were done during the two intervals with 359 new active HCV infections identified and confirmed (0.9%). Characteristics of individuals with new infection are shown in table 1. HCV genotype was available in 70% new diagnoses, with geno-1 and 3 accounting for 3% of the overall population.

Referral to Hepatology and Treatment Attendance

Of the 359 patients with a new HCV diagnosis, only 117 (33%) attended a hepatology clinic appointment, 76 were treated (21%) and had sustained viraemic remission (13%). This shows the loss of patients during the treatment pathway due to a multitude of factors.

Discussion

This study shows the large number of HCV patients processed in a UK teaching hospital laboratory. Overall 0.9% tests confirmed active HCV infection. There was a predominance in men and over one-third were from prison.

Our HCV test had PPV of 87% and performed worse in African populations. This illustrates how tests derived for Caucasian populations do not necessarily apply to other settings. Following our switch to combined HCV-Ab and HCV-Ag test, PPV increased to 100%. Genotypes 1 and 3 predominated in keeping with national and international data.

Significance to Clinical Practice

Our results affirm the approach to diagnosis using HCV-Ag testing which could potentially replace a nucleic acid test for diagnosis or monitoring. PCR however remains the gold standard in both the UK and North America and is needed for genotyping to plan treatment.

The small proportion of diagnosed patients who subsequently attended clinic appointments and received treatment highlights the challenges for HCV elimination. Ensuring the prison population have access to specialist hepatology care seems particularly important given the high proportion of infected patients in prison.

References