Effective Management of Hepatitis C Molecular Testing Improves Test Use Without Compromising Patient Management

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Context.—The availability of effective antiviral therapy for hepatitis C has increased the need for molecular detection and quantification of circulating hepatitis C viral particles. The limits of detection differ for the quantitative and qualitative reverse transcriptase polymerase chain reaction (RT-PCR) assays; furthermore, adequate patient assessment requires both detection of hepatitis C virus when it is present and quantitation of the viral load when possible. The combination of these factors promotes the simultaneous ordering of both tests with the possibility of generating redundant test information.

Objective.—To reduce the number of unnecessary hepatitis C tests performed.

Methods.—We established a reflexive testing protocol for quantitative and qualitative RT-PCR testing for hepatitis C.

Results.—During a 3½-month interval, 170 qualitative RT-PCR hepatitis C tests were eliminated (a 59.4% reduction in the number of these tests). This reduction was achieved without a clinically significant change in turnaround time or a compromise of patient care.

Conclusions.—Establishing the quantitative and qualitative RT-PCR tests in-house and adopting the reflexive testing protocol was cost-effective and did not compromise patient management or care.

(March Pathol Lab Med. 2002;126:100–102)
were performed in batches when the maximum number of patient specimens per run was obtained.

**Management**

Although physicians retained the ability to order either the qualitative or the quantitative test (or both), when indicated, the qualitative test was used for initial testing. The frozen serum was thawed, and an aliquot was removed for testing; the remainder of serum was immediately refrozen at −80°C. When the result of the quantitative test was below the assay limit of detection (600 IU/mL), the qualitative test was carried out (limit of detection, 50 IU/mL). The laboratory records were evaluated to determine the total number of tests performed, the number of qualitative tests not performed, and the turnaround time for each test and for both tests combined. For the qualitative assay, the turnaround time was determined from both the time at which the specimen was acquired from the patient as well as the time at which it was determined that the qualitative test was needed.

**RESULTS**

Historically at our institution, to ensure that all appropriate information was obtained for all individuals, both quantitative and qualitative tests were requested when HCV-infected patients were evaluated. During the initial 3½ months after the introduction of molecular testing for hepatitis C in the Department of Pathology, 286 specimens from 286 individuals were received. The Table summarizes the results of the tests performed on those specimens. One specimen was lost during the interval between quantitative and qualitative testing. In the 3½-month period, by eliminating qualitative tests performed on quantitatively positive specimens, 170 qualitative tests were eliminated, corresponding to a 59.4% reduction in the number of these tests. Annually, this reduction would be a reduction of 583 qualitative assays.

Although the testing protocol drastically reduced the number of qualitative tests, our initial concerns focused on the potential for an increased turnaround time and a possible impact on patient management. The average time from receipt of the specimen until the availability of the final result if both tests were necessary and were performed sequentially was 8.1 days.

**COMMENT**

The availability of effective antiviral therapy for hepatitis C has increased the need for molecular detection of the virus.2-7,13,16-18,20-23,25 Much as the availability of this therapy has increased the need for human immunodeficiency virus testing. In order to save both physician and patient time as well as to accomplish the joint tasks of quantifying HCV (when possible) and using the lowest limit of detection, simultaneous requests for both quantitative and qualitative HCV tests were common. These requests often generated redundant information—negative quantitative results in a patient with a positive qualitative result or positive qualitative results in a patient with a quantified viral load—at an increased cost.

Responding to these divergent priorities (standard of care vs cost), we implemented a reflexive testing protocol. At our institution, the historical data indicated that either a qualitative assay followed by a qualitative assay (if the qualitative result was below the limit of detection) or a qualitative assay followed by a quantitative assay (if the result of the qualitative assay was positive) would have a similar cost-saving potential. Primary care physicians preferred using the qualitative test first. Concerns about any adverse effects of the protocol centered on logistics, maintenance of specimen integrity, and potential increases in turnaround time.

Although the reflexive testing protocol has required a cooperative interaction with the primary care physician, it has been effective and has provided successful analysis for all patients without problems of specimen degradation. The turnaround time remained within acceptable levels, especially for this category of patients (ie, patients often seen at intervals of 3–6 months). In fact, when compared with the turnaround time for the reference laboratory, the turnaround time for our laboratory was shorter (the reference laboratory average was 14 days for all tests). In the interval reported here, 1 specimen was lost; a change in storage organization and procedures has eliminated this potential problem.

An additional prognostic marker in evaluating patients with HCV infection is the viral genotype. We anticipate that adding genotypic analysis to the reflexive testing protocol (ie, attempting to genotype only those specimens with detectable HCV) will further improve testing efficiency and reduce wasted expenditures.

**References**