Chronic Hepatitis C Caused by a Virus – Fiction or for Real?

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The editor of the Hawaii Medical Journal received a printout of an article appearing in a news column on ABCNEWS.com (July 24, 1999) which criticized the scientific community for advocating the theory that the current epidemic of chronic hepatitis C is caused by a virus based on flawed scientific fundamentals. The article was sent to him by two of his patients who obviously were concerned about this and its ramifications.

The issues raised by the author, Mr. Nicholas Regush, are the following:

1. The virus C has never been isolated in an intact form.

2. The virus has never been grown successfully in a cell culture.

3. No animal model of hepatitis C caused by injecting this virus has been established.

4. No one has documented that this virus is infectious.

In other words, the Koch's principles were not met, and therefore to claim that the current candidate HCV-RNA genome reconstructed through molecular engineering techniques is scientifically unsound, and to advocate it to be "the virus which caused the chronic hepatitis is flawed.

The "virus" that caused the post-transfusion non-A non-B hepatitis has been suspected to be in existence since early 1970's. Through many researchers' works, it is known that this agent or agents that caused this disease are filterable and likely to be RNA virus. The scientists from NIH blood bank and CDC virology section had been collecting plasmas from several chimpanzees that had been repeatedly infected by patient's serum and are believed to be infected by these agents. These plasma were all labeled and kept by Dr. Harvey Alter. For many years since 1975, there were many laboratories around the world that were sent samples of an agent that they believed to be the virus that causes the hepatitis. But all failed the tests set up by Dr. Harvey Alter. In 1987 the Chiron Corp. scientists finally identified an antigen that is a fragment of a genetically engineered protein product that they had identified through tedious isolation processes from infected chimpanzees' plasma. This antigen was able to capture a specific antibody circulating in patients with chronic hepatitis due to transfusion. The antigen was then used to develop a serology test. Dr. Alter then tested the serums kept. The results were published in Science magazine in 1987. Since then many different laboratories in the world were able to reproduce their findings and the entire genome of this RNA virus was mapped. It is a fact that so far there is no cell culture system in existence to propagate the virus, but it has been visualized in the endoplasmic reticulum of infected liver cells under electron microscopy. Two articles were recently published having proved that the full-length complementary DNA clone of HCV can transmit hepatitis in the animal model—chimpanzees. In addition, there was much clinical evidence which strongly suggested that this is a real agent which caused about 80-90% of the so-called post-transfusion non-A non-B in the U.S. For instance, both in the U.S. and Japan, the incidence and prevalence of post-transfusion hepatitis C have plunged since the implementation of screening tests for all donated blood. This is especially true in Japan where HIV infection is much less than in the U.S. Furthermore, clinical experience in my own practice and for many of my colleagues who are also engaged in the treatment of chronic hepatitis C, eradication of the HCV-RNA material from serum has not only normalized liver enzymes but also improved or normalized their hepatic histo-pathology. For those unfortunate patients who relapsed after eradication of the virus, their liver enzymes and liver histology also showed recurrence. This is convincing evidence implying that HCV-RNA is indeed the cause of the hepatitis.

I was able to contact and speak with Dr. Richard Strohman, a molecular biologist at UC Berkeley quoted in the news column. He was very kind in agreeing to discuss with me the issues of this concern. I believe Dr. Strohman has a point in pure scientific merit that the current scientific evidence especially without a cultural system and proper animal model is weak and needs more study to prove beyond any doubt that the HCV-RNA is the cause of hepatitis C. But he agreed with me that this scientific impurity should not stop us, the clinicians, to use this HCV-RNA as a surrogate marker to threat our patients who are at risk of developing end stage liver disease and hepatic-cellular cancer. The patients who suffered from chronic hepatitis C should also be aware that the article is arguing for the proper scientific evidence and not that the disease is not in existence. Though personally, I do believe we have the right virus, and recent studies have shown encouraging evidence that the culture system for the virus may become available before too long.

My qualm with the ABC columnist is that he used sensational language and rhetoric in his article which is, I believe was intended for general audiences who are not savvy in molecular sciences creating a false impression that all the farce in current chronic hepatitis C disease is nothing but a "shibai" played by the scientific and medical community in conjunction with the pharmaceutical industry for profit. I think this is not what he intended as can be seen in the first paragraph of this article. Scientific news reporting and

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and would welcome other disciplines to also devote some of their limited educational time to this important topic.

References

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commenting professionals should take particular care not to mislead their readers. This can occur even with careful footnoting, therefore, eye-catching sensational languages really has no place in scientific/medical reporting.

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Editor's Comment

Thank you Naoki Tsai, M.D., for your commentary and review of the Internet news item that has apparently reached many people around the world. As Dr. Tsai state "eye-catching sensational language really has no place in scientific/medical reporting.

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