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Podcast Issue

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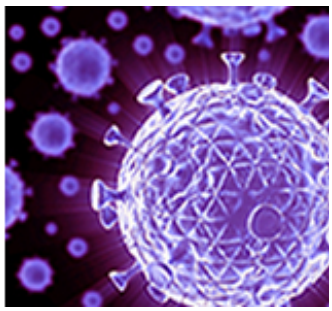

VOLUME 1 — ISSUE 10: TRANSCRIPT

Featured Cases: Human Immunodeficiency Virus and Hepatitis C Virus Coinfection

Our guest author is Mark Sulkowski, MD, Professor of Medicine, Medical Director of the Viral Hepatitis Center, Division of Infectious Diseases and Gastroenterology/ Hepatology at the Johns Hopkins University School of Medicine in Baltimore, Maryland.

At the conclusion of this audio activity, the participants will demonstrate the ability to:

- Describe the epidemiology of HCV infection in HIV-infected persons including the role of sexual transmission of HCV,
- Discuss the use of HCV NS3/4A protease inhibitors for the treatment of chronic HCV infection in HIV-infected persons, and
- Explain the rationale for staging and methodologies used to stage, HCV-related liver disease.

This discussion, offered as a downloadable audio file and companion transcript, covers the important issues related to Human Immunodeficiency Virus and hepatitis C virus coinfection in the format of case-study scenarios for the clinical practice. This program is a follow up to the Volume 1, Issue 9 eHIV Review newsletter — Human Immunodeficiency Virus and Hepatitis C Virus Coinfection.

MEET THE AUTHOR

Mark Sulkowski, MD
Professor of Medicine
Medical Director of the Viral Hepatitis Center
Division of Infectious Diseases and Gastroenterology/Hepatology
The Johns Hopkins University School of Medicine
Baltimore, Maryland

Unlabeled/Unapproved Uses

Dr. Sulkowski also notes that his presentation today will include a discussion of the off-label or unapproved uses of telaprevir and boceprevir.

Faculty Disclosure

Dr. Sulkowski has disclosed that he has served as a consultant for AbbVie, Inc., Boehringer Ingelheim Pharmaceuticals, Inc., BMS, Gilead, Janssen, Merck, Roche, and Vertex Pharmaceuticals. He has also served as the principle investigator for research grants and/or research support to the Johns Hopkins University from AbbVie, Inc., Boehringer Ingelheim Pharmaceuticals, Inc., BMS, Gilead, Janssen, Merck, Roche and Vertex Pharmaceuticals.

PROGRAM DIRECTORS

Richard Moore, MD, MHS
Professor of Medicine
Director, Moore Clinic for HIV Care
Divisions of Infectious Diseases and Clinical Pharmacology
The Johns Hopkins University School of Medicine
Baltimore, Maryland

Michael Melia, MD
Associate Professor of Medicine
Associate Fellowship Program Director
Division of Infectious Diseases
The Johns Hopkins University School of Medicine
Baltimore, Maryland

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Next Issue
Emerging Promises and Challenges with the Use of Antiretroviral Therapy for Prevention of HIV Transmission

CME INFORMATION ⇩ PROGRAM BEGINS BELOW

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STATEMENT OF NEED
Three central ideas emerged from our needs assessment. In order to provide optimal treatment to patients with HIV:

- Clinicians caring for patients with HIV need current information about: appropriate treatment and maintenance of care…guidance for treating comorbidities…and information about emerging findings for treating HIV-associated neurocognitive disorders (HAND)
- The need for more information on HIV topics including updated guidelines for HIV, treating older patients with HIV, managing patients with comorbidities and coinfections, treatment and sequencing strategies for maximizing future therapeutic options, and new and emerging agents for HIV
- Treating comorbidities in patients with HIV, especially among people older than age 50

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MR. BOB BUSKER: Welcome to this *e*HIV Review Podcast.

*e*HIV Review is presented by The Johns Hopkins University School of Medicine. This program is supported by educational grants from Abbott Laboratories, Boehringer Ingelheim Pharmaceuticals, Inc., and Bristol-Myers Squibb.

Today's program is the companion piece to our Volume 1, Issue 9 newsletter topic: *Human Immunodeficiency Virus and Hepatitis C Virus Coinfection*.

Our guest is that issue's author, Dr. Mark Sulkowski from the Johns Hopkins University School of Medicine.

This activity has been developed for infectious disease specialists, primary care physicians, nurse practitioners, and other health care practitioners whose practice includes treating HIV patients. There are no fees or prerequisites for this activity.

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Learning objectives are, that after participating in this activity, the participant will demonstrate the ability to:

- Describe the epidemiology of hepatitis C infection in HIV-infected persons, including the role of sexual transmission of HCV;
- Discuss the use of HCV NS3/4A protease inhibitors for the treatment of chronic HCV infection in HIV-infected persons; and
- Explain the rationale for staging and methodologies used to stage, HCV-related liver disease.

I'm Bob Busker, managing editor of eHIV review. Our guest today is Dr. Mark Sulkowski, professor of medicine and medical director of the Viral Hepatitis Center, Division of Infectious Diseases and Gastroenterology/Hepatology at the Johns Hopkins University School of Medicine.

Dr. Sulkowski has disclosed that he has received grants and/or research support from AbbVie, Inc., Boehringer Ingelheim Pharmaceuticals, Inc, Bristol Myers Squibb, Gilead, Janssen, Merck, Roche, and Vertex Pharmaceuticals. He has also served as a consultant for AbbVie, Inc., Boehringer Ingelheim Pharmaceuticals, Inc, Bristol Myers Squibb, Gilead, Janssen, Merck, Roche, and Vertex Pharmaceuticals.

As no agents are currently indicated specifically for the treatment of hepatitis C in HIV-infected persons, his discussion of telaprevir and boceprevir should be considered off-label or unapproved usage of these drugs.

Dr. Sulkowski, welcome to this eHIV Review Podcast.

DR. MARK SULKOWSKI: Great, thank you, I'm thrilled to be here.

MR. BUSKER: Our topic is HIV-Hepatitis C coinfection. In your newsletter issue Doctor, you discussed recent research into the sexual transmission of hepatitis C, the impact of HIV/HCV coinfection on mortality, and the treatment of hepatitis C in patients infected with HIV. I'm going to ask you to present us with a couple of patients to focus on how that information can best be applied in clinical practice. But first, I'd like to talk specifically about hepatitis C. Let's start with screening.

DR. SULKOWSKI: The idea behind this disease is to identify patients early so that they can be screened and potentially treated. And one of the issues that we face in the United States and other parts of the world is that screening for hepatitis C has really lagged. And in part that's because up until very recently, the criteria for screening were based on the clinician or a health care provider eliciting risk behaviors. In other words, the patient's primary care physician would have needed to elicit a history of injection drug use in order to know this patient qualified for screening.

So based on this failure to identify infected people, the Center for Disease Control has actually announced a plan to switch the screening criteria for hepatitis C to what's called "birth cohort screening."

And what this essentially means is that the so-called baby boomers, those born between 1945 and 1965, should have a hepatitis C screening test with the antibody done simply based on their year of birth. In other words, it's a shift away from this risk-factor screening.

MR. BUSKER: What's known about the impact of hepatitis C on mortality?

DR. SULKOWSKI: When one looks at the reason the CDC has announced plans that change how we look for hepatitis C, it is really based on data. And there was a publication recently in the *Annals of Internal Medicine* that focused on the impact in terms of cause of death. And one of the remarkable facts in this analysis looking at US death certificates was that since 2007 more Americans have died from hepatitis C-related consequences than HIV. Now the reasons for this are because of the high prevalence of hepatitis C. It is estimated between 4 and 5 million Americans are infected, the low rates of screening and diagnosis and relatively ineffective treatments up until very recently.

At the same time there's been very effective efforts to screen for HIV as well as the development of highly effective antiretroviral drugs. And that result has been that HIV deaths have fallen and hepatitis C deaths have continued to increase as Americans infected with this virus grow older.

One of the important findings in this particular study was that hepatitis C deaths were higher in those with HIV coinfection and those who consumed alcohol. So we know that these are two factors that increase the risk of a hepatitis C infected person progressing to cirrhosis and then the complications of cirrhosis.

So we've learned that HIV coinfection is an important factor for us to focus on with respect to trying to eradicate hepatitis C.

MR. BUSKER: Another article in that same issue of *Annals of Internal Medicine* looked at the cost-effectiveness of hepatitis C screening, and the authors there noted that fully implemented birth cohort screening would likely identify over 800,000 new cases of HCV. So when a patient is newly diagnosed with hepatitis C, what initial steps should the clinician take?

DR. SULKOWSKI: Well there are several important things that need to happen after a person is diagnosed. Now the first thing is that that person becomes aware of their infection and the possibility of spreading it to other individuals. The spread is primarily through blood transmission, but they need to know how hepatitis C is transmitted and steps to prevent it.

In addition, they need to know ways that they can prevent further damage to their liver. The first we've already touched on, which is alcohol. People with chronic hepatitis C infection should be advised not to consume any alcohol. It's a major risk factor in terms of progression of damage due to this particular virus.

The second point, and one that's emerging particularly here in the United States, is that they should achieve or maintain an ideal body mass index. What we're seeing is the impact of obesity on chronic hepatitis C, there's an additional hepatic insult, if you will, in the form of steatosis or fatty liver. So people often ask me what's the best diet for someone who is hepatitis C infected, and my answer is typically it should be a diet that restricts calories, because maintaining a normal body weight can help prevent further progression.

Another point that is probably worth mentioning is the role of coffee intake. There's been a number of studies that have come out of the NIH that have actually suggested that coffee intake may be linked to lower risk of liver disease progression. So I talk to patients about this. It's unknown if this is a true impact, but this is a consistent finding across many studies.

And the final point is that patients who are hepatitis C infected should consider hepatitis C treatment. Now keep in mind, I did not say they should all be treated, but they need to be carefully evaluated for liver disease stage and at least discuss the potential benefits, as well as risks of antiviral therapy for chronic hepatitis C.

MR. BUSKER: Dr. Sulkowski, thank you for that background on hepatitis C. Let me ask you now to describe a patient with HIV-hepatitis C coinfection, if you would, please.

DR. SULKOWSKI: This is a 38-year-old man who has been infected with HIV really since 1994 and more recently has been on antiretroviral therapy that's really done a fabulous job. He's been taking darunavir boosted by ritonavir, tenofovir, and FTC with a recent

CD4 cell count of 280 and an HIV RNA that is less than 20 copies per mL.

Now this individual had been tested for hepatitis C and had been negative. He does, however, have a history of drug use in the form of crystal methamphetamine and alcohol use. That had been relatively inactive for a period of time but he came in for a routine clinic appointment and had laboratory testing drawn that revealed a serum ALT of 635 international units.

Now his prior ALT levels had all been 20 or less, they had been in the normal range, so he was called back into the clinic and underwent some questioning about recent exposures. He did report a recent increase in his alcohol intake, he'd also had a brief relapse into crystal methamphetamine use and importantly had engaged in unprotected anal receptive intercourse with other HIV infected men.

So prior testing had revealed, as I mentioned, no evidence of hepatitis C, no evidence of hepatitis A or B, but now he presents with acute hepatitis.

MR. BUSKER: So — based on that description, what are the possible causes of this patient's hepatitis?

DR. SULKOWSKI: Well this is a scenario that certainly warrants a careful evaluation. I think one of the first things is to consider could this be due to alcohol or other hepatotoxins. And certainly that's taking a careful history.

It is also important to consider could this be acute hepatitis A or hepatitis B infection. I'll pause here to comment that it's important that patients with HIV are vaccinated against hepatitis A and B if they are not immune to prevent these infections. But certainly a patient could present with acute hepatitis A or B.

But this is really a classic story for sexually acquired hepatitis C infection among an HIV infected man who is engaged in high risk, anal receptive intercourse.

Now this is something that's been increasingly recognized as a problem among this population. In general, hepatitis C is not felt to be a highly sexually transmitted virus, but in the context of HIV coinfection and traumatic sexual practices, we are now seeing around the world cases of acute hepatitis C in this patient population.

So there have been some changes to current guidelines that actually recommend annual hepatitis C screening, but the reality of it is that most patients with acute hepatitis C in this fashion are picked up by an elevated serum ALT level. So this is a case that was recently highlighted by a report in the MMWR, so this is something that clinicians are increasingly aware of.

MR. BUSKER: How should this patient be evaluated by the clinician?

DR. SULKOWSKI: Well, in terms of evaluation for acute hepatitis C, the important point to make is that in addition to a hepatitis C antibody, a hepatitis C RNA test should be done. The RNA will become detectable by PCR prior to the antibody seroconversion. So if you are thinking acute hepatitis C you need to order an RNA test in order to look for that diagnosis.

Now, once hepatitis C is identified there needs to be a discussion about how to manage that patient and some clinicians feel that an IL28-B test, which describes the patient's genetics, might also be helpful. Now the reason is that people who have a stable IL28-B genotype are more likely to resolve their hepatitis C spontaneously. So some clinicians have suggested there may be a role for this test, others feel it's not particularly valuable, but that's a consideration.

Now the final point in terms of evaluation, if you have confidently identified acute hepatitis C there really is no role for liver biopsy. I think if the diagnosis is still in question, then a biopsy may be important to determine the cause of liver injury. But if this is acute hepatitis C and you've identified that serologically and virologically, then you need to move on to management of the patient.

MR. BUSKER: Let's assume that the clinician confirms hepatitis C infection. Should this coinfected patient be treated at this point; and if so, how?

DR. SULKOWSKI: Well acute hepatitis C is important to identify, because treatment is more successful if one intervenes during the acute phase, which is generally defined as within six months of the infection, as opposed to the chronic phase. Once the patient evolves to chronic hepatitis C, the responsiveness to interferon-based therapies appears to fall.

Now, this desire to treat needs to be balanced against the idea that some patients will actually clear their hepatitis C spontaneously. Now in HIV infected patients they are less likely to clear spontaneously because of the immunodeficiency from the HIV.

So some individuals will test for IL28-B, and if they have a favorable clearance genotype identified, that is IL28-BCC, they may observe the patient for several months to see if they spontaneously clear.

Now the Europeans have recommended to monitor the viral load over time, and if the viral load does not decline more than 2 log, then the patient is unlikely to clear spontaneously and they would offer treatment.

So the bottom line is that most clinicians would recommend being fairly aggressive with antiviral therapy in acute hepatitis C in an HIV infected individual. The general treatment is with pegylated interferon-alpha given by injection once a week, and ribavirin twice a day. And this is given typically for 24 weeks.

There are no well-designed clinical trials; this is based on data from HIV-negative patients and some studies from those who are coinfected. I think one important point to make is that we'll discuss the hepatitis C protease inhibitors telaprevir and bocepravir, but at least in my mind there is no role for protease inhibitors as the initial management strategy for acute hepatitis C. And that's because the virus is much more responsive to these interventions early during the acute process and I typically would use peg-interferon and ribavirin, only adding one of the protease inhibitors if the patient fails to respond.

MR. BUSKER: Survey data have reported that some clinicians will tell a patient who has spontaneously cleared acute HCV that they are now immune to any further infections. Other survey data say some clinicians are telling patients that they should be vaccinated against HCV. Your comments?

DR. SULKOWSKI: Well there certainly is a lot of confusion about viral hepatitis and vaccinations and immunity, I think it's worth spending a minute talking about this.

Hepatitis A and B are both viral hepatitis pathogens that can be prevented by vaccination quite effectively. In addition, for those pathogens, once an individual is infected and clears the infection, they are protected against further infection.

Unfortunately, hepatitis C is a different virus altogether. There is no protective immunity in most individuals. So a patient that is infected and spontaneously clears or clears their infection with antiviral treatment can be reinfected. So an important point is that all patients who are successfully treated or clear spontaneously know that they need to avoid potential exposures to this pathogen.

Now vaccine is also much more challenging, and in many ways this virus is more akin to the vaccination challenges of HIV. The virus is quite heterogeneous and has been difficult to battle with typical vaccine designs. Now there are some very exciting prospects underway, but at this point in time there is no vaccination against hepatitis C.

MR. BUSKER: And we'll return in a moment, with Dr. Mark Sulkowski from the Johns Hopkins University School of Medicine.

DR. MICHAEL MELIA: Hello. I'm Michael Melia, Associate Professor of Medicine in the Division of Infectious Diseases and Associate Fellowship Program Director at The Johns Hopkins University School of Medicine. I'm one of the Program Directors of *e*HIV Review.

*e*HIV Review is a combination newsletter and podcast program delivered by email to subscribers. Newsletters are published every other month. Each issue reviews the current literature in areas of importance to infectious disease specialists, primary care physicians, nurse practitioners, and other health care practitioners whose work or practice includes treating HIV patients

Bimonthly podcasts are also available as downloadable transcripts, providing case-based scenarios to help bring that new clinical information into practice in the exam room and at the bedside.

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MR. BUSKER: Welcome back to this eHIV Review podcast. I'm Bob Busker, managing editor of the program. Our guest is Dr. Mark Sulkowski, medical director of the Viral Hepatitis Center at the Johns Hopkins University School of Medicine. And our topic is HIV/HCV Coinfection.

We've been looking at how some of the new information Dr. Sulkowski discussed in his newsletter issue can be applied in clinical practice. So if you would, Doctor — describe another patient for us.

DR. SULKOWSKI: Well the next patient I'd like to talk about is a patient with HIV and hepatitis C coinfection. Now this is a 63-year-old woman with HIV that is well controlled on a regimen of efavirenz, tenofovir, and FTC. Her CD4 cell count is outstanding at 756, HIV RNA is not detected.

Now this individual also has chronic hepatitis C that had been diagnosed previously and most likely acquired nearly 30 years ago through injection drug use. Now she has been stable for quite some time and has been worked up to some degree by her primary HIV clinician. She has a serum ALT of 56 which is above the upper limit of the normal reference range which is 40, and has been found to have hepatitis C genotype 1, subtype A.

Now this patient is fairly typical of many patients with coinfection: they are getting older and have had coinfection for a number of decades, in this case nearly three decades. So the question that we'll need to discuss is how to manage this patient.

MR. BUSKER: So my first management question: would you consider this patient a candidate for HCV treatment?

DR. SULKOWSKI: Well I think the answer to that question is maybe. And the point I want to make is that all patients with HIV and hepatitis C are potentially candidates for antiviral therapy for hepatitis C. And again, that doesn't mean that we would treat every coinfected individual but what it means is they need to be carefully evaluated to determine if they're eligible for current hepatitis C treatment.

Now that means taking a careful medical and psychiatric history to determine if there are any factors that make the patient a poor candidate for interferon-based therapy. For example, major depression that is poorly controlled may be a contraindication to interferon. At the same time, major depression that is well controlled with medications is not a contraindication. So that requires a careful evaluation of the patient to determine whether or not they should be treated.

In addition, this patient needs to know what the potential benefits are of successful treatment as well as what the potential risks are of current therapies in terms of side effects. So what I'm recommending is that co-infected patients have a consultation and discussion about their hepatitis C and their candidacy for treatment.

MR. BUSKER: Based on those considerations, should she be given HCV treatment now?

DR. SULKOWSKI: Well there's a number of factors that go into the question of should we treat this patient now. The first thing is to recognize that current treatments include peg-Interferon given once a week, ribavirin pills given twice a day by mouth, and in some patients hepatitis C protease inhibitors, telaprevir and boceprevir, which are given by mouth thrice daily. These treatments can be effective in eradicating the disease, but they also have significant side effects as well as potential interactions with HIV medications.

So, in general, we need to understand this patient's risk of hepatitis C- related liver disease. So patients with hepatitis C may or may not have advanced scarring due to the hepatitis C virus, and the major question I want to know when sitting down with this patient is how much damage has been done by the hepatitis C virus over the 30 years of hepatitis C infection, the last 10 or so which have been a coinfection with HIV?

The degree of liver damage, that is fibrosis or scarring, due to hepatitis C, predicts the likelihood that a patient will progress to liver failure, liver cancer or liver related death. In addition, we need to weigh that risk against the potential benefits and risk of therapy as already mentioned.

So what I'd like to do with a patient like this is understand their liver disease stage. Now the gold standard for staging liver disease is a liver biopsy. With this procedure, a small piece of liver is removed with a needle and we look at that in the pathology lab to measure the degree of fibrosis or scarring. And this could be staged on a 0 to 4 scale which is commonly used, 4 being cirrhosis and 0 being no scar. And, in general, people with stage 0 have a fairly good prognosis, and those with stages 3 or 4, more advanced scarring, are more likely to progress.

Now one of the challenges is that liver biopsy is an invasive test and typically may be difficult for patients to undergo. There is an intense interest in so-called noninvasive tests which are both commercially available, there is a test available called FibroSURE™, and there are tests that are done on basic laboratory tests including the AST platelet ratio index, which just requires an AST and platelet count. So clinicians can get a rough idea of the stage just by using blood tests.

Now there is a technology that is being used in Europe and other parts of the world called transient elastography, or Fibroscan®, that actually measures liver stiffness. And this could be done at the bedside and may some day be used in the United States as a way to stage fibrosis.

But the important point, getting back to this patient, is we need to know her liver disease stage in order to counsel her about the potential benefits and risks of anti-HCV therapy.

MR. BUSKER: Talk to us about how liver disease staging influences hepatitis C treatment decisions.

DR. SULKOWSKI: Well as I mentioned, liver disease staging is really critical. It's a bit like, let's take HIV as an example. For many years as antiretroviral therapy was evolving, we used the CD4 cell count to stage the HIV disease. And for quite a long period of time the recommendations from expert panels were to give antiretroviral therapy to those with low CD4 counts because of the increased risk of AIDS and death, whereas you would withhold therapy from those with high CD4 counts because of the risk of toxicity from the antiretroviral therapy.

So if we take that model and apply it to hepatitis C, it is really the same scenario. In patients with no or minimal hepatic fibrosis — that is, a relatively benign appearing liver biopsy or noninvasive test — it's important to discuss treatment with that patient, but we certainly know that there are novel therapies, so-called direct antivirals, that are rapidly emerging in development, and many people would consider waiting for these newer treatments.

For example, at a recent international scientific meeting, we saw data in HIV-negative patients with hepatitis C genotype 1, who were given essentially two-direct acting antiviral agents, once a day for 24 weeks, leading to very high rates of virologic response. So there is great hope that within the next two, three, four, five years, we're going to have better therapies for these patients with minimal disease, so some clinicians recommend waiting in this patient group.

On the other hand, for the patients that have more than minimal liver damage, waiting for these new treatments may not be the best prospect. Certainly one of the issues is that these patients could progress and these exciting future therapies may actually not come to fruition. We think they will, but they are still in the future. So in my view, patients who have more than minimal significant fibrosis, maybe we ought to consider treating those patients with current therapies which, as I've suggested, are PEG interferon and ribavirin and consideration of using telaprevir or bocepravir.

MR. BUSKER: Thank you, Doctor. I think we've got time for one more case, so if you would, please bring us another patient.

DR. SULKOWSKI: Well the last case I'd like to talk about is that of a coinfected man. This is a 56 year old man with well controlled HIV infection, taking darunavir, ritonavir, tenofovir, and emtricitabine. He also has chronic hepatitis C, genotype 1, subtype B, and has cirrhosis identified on liver biopsy.

Now he is fully compensated, he's never had ascites, encephalopathy or bleeding varicies, and his bilirubin and prothrombin time are all normal. He does have a slightly low platelet count, 98,000, but he is otherwise healthy and very anxious to do something to treat his hepatitis C.

MR. BUSKER: How should this patient be managed?

DR. SULKOWSKI: Well this is, unfortunately, an increasingly common scenario in our HIV/hepatitis C coinfection clinic. As patients grow older with HIV and hepatitis C coinfection, some will progress to cirrhosis. Now the first steps are really to screen this patient for hepatocarcinoma and the recommendations are that he gets an ultrasound or other liver imaging every six months. He should also be referred for upper endoscopy to look for esophageal varices and should be managed quite closely, perhaps in conjunction with a gastroenterologist or hepatologist.

The finding of cirrhosis in an HIV-infected patient really identifies a patient at high risk for liver outcome. And then importantly, this patient has the potential to really benefit from successful hepatitis C treatment and in my view should be considered for aggressive antiviral therapy.

MR. BUSKER: Aggressive antiviral therapy — would you recommend that for this patient at this time?

DR. SULKOWSKI: Well in terms of how to treat this patient, I think we've seen that the hepatitis C protease inhibitors, telaprevir and bocepravir, when added to PEG interferon/ribavirin, substantially increase the likelihood of sustained virologic response or cure.

Now these drugs were approved in the United States in May 2011 based on greater efficacy over therapy with PEG interferon and ribavirin. Now in patients without HIV infection, these led to SVR rates in the ballpark of 65 to 75%. Now this was about 30% better than PEG interferon and ribavirin alone.

Now these medications were linked to additional side effects. They cause a worsening of anemia for both telaprevir and bocepravir, and telaprevir has been linked to a rash and a severe rash in about 4% of people who take the therapy. So they do add to the side-effect profile.

Now one of the important issues is that when these drugs were reviewed by the US FDA in the spring of 2011, there were no data on the use of these drugs in patients with HIV/hepatitis C coinfection. So the initial approval does not include the use of these drugs in patients with coinfection. So in that sense we have been really struggling to figure out how to use those.

Importantly, in March of 2012, at the CROI meeting, there was a presentation of two relatively small phase 2 studies, one with telaprevir in combination with PEG interferon and ribavirin, and the second with bocepravir in combination with PEG interferon and ribavirin. Now these studies were done in patients with well-controlled HIV and hepatitis C genotype 1 infection. The data presented at the CROI meeting in March of 2012 showed that the patients who got the active drug — that is telaprevir and bocepravir — had a substantially higher likelihood of achieving SVR-12, as it was called, These were about 30% higher than patients treated with peg-Interferon and ribavirin.

So certainly many clinicians left that meeting with the idea that these drugs do have a strong possibility of increasing the SVR rate in this very difficult-to-treat patient population, so there has been an increasing emphasis on their use.

Now there are some challenges, these include potential drug interactions with HIV therapies, as well as the cost — these medications are certainly expensive — but the greater efficacy and acceptable tolerability has led some expert guidelines to recommend their use in coinfectioned patients.

MR. BUSKER: Continue on that point, if you would, about potential interactions with the antiretrovirals.

DR. SULKOWSKI: Well as I mentioned briefly, both telaprevir and bocepravir are metabolized through the liver, and there are potential interactions with HIV protease inhibitors as well as other drugs used to treat HIV.

So one of the important points I'd make is that it's critical that clinicians using these drugs in HIV infected patients consult both the labeling for these medications, as well as expert resources to make sure they are using drugs that are compatible with telaprevir and bocepravir.

This may sometimes be a challenge, but I think with careful consideration prior to treatment, many patients can have their HIV therapy adjusted to allow the use of these drugs. But it is critically important that these potential interactions be reviewed before initiating treatment.

MR. BUSKER: Thank you for those cases, Doctor. I'd like to review now what we've discussed today. First

point: the epidemiology of hepatitis C infection in HIV infected persons.

DR. SULKOWSKI: We talked about several important points, the first is that hepatitis C is a common pathogen in those with HIV, and it is actually leading to more deaths in the United States than HIV infection. So it's an important pathogen to pay attention to in this population.

We also focused on the emerging data on sexually transmitted hepatitis C among men who have sex with men. And this is an important point for clinicians who care for HIV infected patients to be aware that in this population, hepatitis C is a sexually transmitted disease.

MR. BUSKER: And the use of the protease inhibitors for the treatment of chronic hepatitis C in HIV infected persons.

DR. SULKOWSKI: Well the first point to make with respect to the use of protease inhibitors is that these are not FDA-approved for use in HIV infected persons. That said, in March of 2012 we saw compelling data for the use of telaprevir and bocepravir in combination with PEG interferon and ribavirin in carefully selected coinfected patients.

So I think many clinicians and expert guidelines are making cautious recommendations for the use of these drugs simply based on the fact that the sustained virologic response rates are substantially higher. More studies are needed, but patients can benefit from these therapies today.

MR. BUSKER: And finally, staging HCV-related liver disease — the rationale for it and the methodologies that can be used?

DR. SULKOWSKI: Well one of the critical points that we discussed is, in terms of which patients to treat with these protease inhibitors in combination with peg-Interferon and ribavirin. it's really based on hepatitis C-related liver disease stage.

So one of the points that we highlight in our cases is the need to understand the disease that hepatitis C is causing. That is routinely done by liver biopsy, but increasingly we're using other modalities to evaluate staging, including noninvasive blood tests and potentially in the future, a test called transient elastography.

But the important point is, when considering medications like telaprevir and bocepravir, one really needs to understand the potential risks and benefits of therapy, and to do that, you need to understand the liver disease stage.

MR. BUSKER: Dr. Mark Sulkowski from the Johns Hopkins University School of Medicine — Thank you for participating in this e-HIV Hepatitis Review Podcast.

DR. SULKOWSKI: Well thanks, Bob. It's been a lot of fun talking about the challenges of hepatitis C in HIV infected patients, and I really enjoyed our discussion. Thank you.

MR. BUSKER: This podcast is presented in conjunction with the eHIV Review Newsletter, a peer-reviewed literature review certified for CME credit, emailed monthly to clinicians treating patients with HIV.

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