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Focus on on Hepatitis C

- by Allen Lefkovitz

Hepatitis is an inflammation of the liver that can result in impaired digestion, blood clotting, and immune response as well as difficulty removing toxic substances from the body (including some drugs and their metabolites). In the United States, hepatitis is most often caused by one of three viruses: hepatitis A virus (HAV), hepatitis B virus (HBV), or hepatitis C virus (HCV). Rates of hepatitis C (HepC) infections continue to rise with more than 41,000 new HepC infections annually and 3.5 million people chronically infected with HCV. These numbers represent more than the number of individuals affected by HAV and HBV combined.

An estimated 50% of individuals infected with the HCV are not aware of it, which makes HCV testing an important healthcare service. The Centers for Disease Control and Prevention (CDC) have estimated that one-time testing of only those individuals born from 1945 to 1965 could “avert more than 120,000 HCV-related deaths” and save up to $7.1 billion in liver-disease related costs.

Acute HepC is generally associated with minor symptoms (see Figure 1) or is asymptomatic. Following exposure, infection may occur from 2 weeks to 6 months later. While it generally only lasts a few weeks, acute HepC may transition to chronic HepC, which is a lifelong condition that may quietly progress over many years with devastating consequences. Liver failure from HepC is the leading cause for someone to need liver transplantation. With at least 18,000 deaths related to HCV in 2016 (and this is considered to be an underestimation), HepC is the deadliest reportable infectious disease in the United States.

Among those who develop chronic HepC, there is up to a 5% annual risk of liver cancer and up to a 6% annual risk of hepatic decompensation, which may result in death. Up to 20% of individuals who develop chronic HepC will go on to develop cirrhosis within 20 to 30 years. Risk of cirrhosis is increased in males, those over 50 years or age, individuals with nonalcoholic fatty liver disease, concomitant HBV or HIV infection, and/or with use of immunosuppressive therapy (e.g., tacrolimus).

Figure 1 - Symptoms of Acute HepC

Fever	Fatigue	Dark Urine	Clay-colored Stool	Abdominal Pain
Loss of Appetite	Nausea/Vomiting	Joint Pain	Jaundice	

Continued on next page

Inside This Issue

Individuals at higher risk of having HepC include:

- Everyone born between 1945 and 1965
- Current or past injectable drug users *(most common cause)*
- Recipients of clotting factors made before 1987
- Recipients of blood transfusions or solid organ transplants prior to July 1992
- Those who undergo chronic hemodialysis
- Healthcare workers experiencing a needlestick involving an HCV-positive patient
- Individuals with HIV
- Children born to an HCV-positive mother

Even though the risk may be lower, other individuals who may be at risk for HepC include those who:

- Have sex with an HCV-infected individual
- Share personal items contaminated with infectious blood (e.g., razor, toothbrush)
- Have gotten a tattoo or piercing in an unregulated setting
- Are in the prison system
- Have past or present history of intranasal illicit drug use

The initial step toward diagnosing HepC involves testing for HCV antibodies. Individuals with those antibodies must then undergo HCV RNA testing in order to differentiate between who is currently infected with HCV and who may have been infected in the past but has now cleared the virus. While it is not fully understood how it occurs, evidence suggests that 15-25% of individuals who are infected with HCV will spontaneously clear the infection without treatment. However, in the remaining 75-85% of cases, the person will progress to chronic HepC. Those who test positive with the HCV RNA testing should be further tested to determine the specific genotype of the virus. There have been 7 distinct genotypes and 67 subtypes identified for HCV thus far.

Although research is ongoing, unlike with both HAV and HBV, currently there is no available vaccine to prevent HepC. **Strong infection control measures and avoidance of risk factors are imperative**. Within the State Operations Manual (SOM) under F880 Infection Control, blood glucose meters are identified as an area of potential risk, and specific guidance around proper disinfection practices states "The disinfection solvent you choose should be effective against HIV, Hepatitis C, and Hepatitis B virus. Outbreak episodes have been largely due to transmission of Hepatitis B and C viruses." Additionally, the SOM states that "Blood glucose meters dedicated for single-resident use should be stored in a manner that will protect against inadvertent use of the device for additional residents and also cross-contamination via contact with other meters or equipment." In the past decade, the US Food and Drug Administration, CDC, and the Institute for Safe Medication Practices have repeatedly warned against the sharing of multi-dose pen devices (e.g., insulin pens) due to the risk of spreading serious infections including HepC. Fingerstick devices and multi-dose pen devices must never be used for more than one person.

According to current treatment guidelines "Treatment is recommended for all patients with chronic HCV infection, except those with a short life expectancy that cannot be remediated by HCV therapy, liver transplantation, or another directed therapy." Because guidance on treating HepC is rapidly changing, healthcare professionals are advised to review the latest guidance at https://www.hcvguidelines.org/ prior to making any treatment decisions. Other important resources to assist in the management of HepC are available at:

https://www.hepatitisc.uw.edu/page/treatment/drugs

https://www.cdc.gov/hepatitis/hcv/index.htm

In addition to reducing the risk of transmitting HCV to others, research has shown that curing HepC is associated with at least a 70% reduction in the risk of liver cancer and a 90% reduction in the risk of liver-related mortality and liver transplantation. While past treatments consisted largely of injectable interferons, the availability of oral treatment options with shorter durations of therapy and improved tolerability have all led to advances in treating HepC. Although very expensive, treatment of HepC has been repeatedly demonstrated as "cost-effective". According to CDC "Over 90% of HCV infected persons can be cured of HCV infection regardless of HCV genotype, with 8-12 weeks of oral therapy."

Continued on next page

Focus on Hepatitis, continued.

Based upon the specific genotype of HCV and whether or not an individual has cirrhosis, treatment generally consists of 8 to 12 weeks of daily fixed-dose combinations of direct-acting antivirals including, but not limited to:

Eplcusa (sofosbuvir/velpatasvir)	Viekira Pak (ombitasvir/paritaprevir/ritonavir and dasabuvir)
Harvoni (ledipasvir/sofosbuvir)	Sovaldi (sofosbuvir)
Mayvet (glecaprevir/pibrentasvir)	Olysio (simeprevir)
Vosevi (sofosbuvir/velpatasvir/voxilaprevir)	Rebetol (ribavirin)
Zepatier (elbasvir/grazoprevir)	Daklinza (daclatasvir)
Pegasys (peginterferon alfa-2a)	

In addition to ensuring strict adherence to therapy, proper administration with respect to food and potential drug interactions is critically important with each of these medications. The most common adverse effects with these medications that should be monitored for during therapy include headache, nausea, fatigue, insomnia, itching, and diarrhea. Prior to starting and periodically during treatment, measurement of kidney function, INR, liver function tests, and CBC monitoring are necessary.

Other recommendations for treating individuals with chronic or prior HepC include:

- Vaccination against HAV and HBV
- Pneumococcal vaccinations
- Weight loss for those who are overweight or obese
- Avoidance of alcohol
- Avoidance of medications (prescription or over-the counter) or supplements that may potentially damage the liver (e.g., divalproex, methotrexate, vitamin A, kava, black cohosh)
  - When medications associated with liver damage are utilized, dosage adjustments (e.g., lower doses, reduced dosing frequency) are essential.
- Avoidance of drugs that may impair kidney function (due to their already having compromised liver function)
- Awareness that someone previously treated and/or cured can be reinfected with HepC if risk factors are not continually addressed.

NEW Generic Medications

- by Allen Lefkovitz

Generic Name	Brand Name	Date Generic Available
Amphetamine Sulfate 5 mg and 10 mg Tablet	Evekeo® Tablet	10/5/18
Bupropion 450 mg Tablet ER	Forfivo XL® Tablet ER	9/28/18
Morphine Sulfate 40 mg Capsule ER	Kadian® Capsule ER	9/28/18
Tadalafil 2.5 mg, 5 mg, 10 mg, and 20 mg Tablet	Cialis® Tablet	9/27/18
Albendazole 200 mg Tablet	Albenza® Tablet	9/21/18
Dalfampridine 10 mg Tablet ER	Ampyra® Tablet ER	9/11/18

Nuzyra™ Tablets and Injection

- by Dave Pregizer

Brand Name (Generic Name)	**Nuzyra [new ZI ra] (omadacycline) [oh MAD a SYE kleen]**
How Supplied	**Tablets**: 150 mg omadacycline **For Injection**: 100 mg of omadacycline as a lyophilized powder in a single dose vial for reconstitution and further dilution before intravenous infusion.
Therapeutic Class	A tetracycline class antibacterial
Approved Indication	Community-acquired bacterial pneumonia (CABP) or acute bacterial skin and skin structure infections (ABSSSI) caused by susceptible microorganisms
Usual Dosing	**CABP and ABSSSI**: Day 1: 200 mg IV over 60 minutes OR two doses of 100 mg IV over 30 minutes; after day 1: 100 mg IV over 30 minutes once daily OR 300 mg orally once daily for a total of 7 to 14 days. **ABSSSI (tablets only)**: Days 1 and 2: 450 mg orally once daily; then, 300 mg orally once daily for a total of 7 to 14 days.
Select Drug Interactions	Anticoagulant therapy may require reduction in anticoagulant dosage and increased monitoring. Absorption of oral Nuzyra is impaired by antacids containing aluminum, calcium, or magnesium, bismuth subsalicylate, and iron containing preparations.
Most Common Side Effects	Nausea, vomiting, infusion site reactions, elevated liver enzymes, hypertension, headache, diarrhea, insomnia, and constipation.
Miscellaneous	Fasting should occur for at least 4 hours prior to administering Nuzyra tablets with water. No food or drink (except water) should be consumed for 2 hours and no dairy products, antacids, or multivitamins for 4 hours after oral administration.
Website	www.nuzyra.com

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