Bleeding Disorders & Hepatitis C

Forward

Before effective screening of the blood supply and viral inactivation techniques were introduced in the mid 1980’s, the population most at risk for getting hepatitis C and other blood-borne viruses, such as HIV and hepatitis B was largely made up of those with various types of bleeding disorders.

This is because the standard treatment at the time was either to use whole blood transfusions, or infusions of cryoprecipitates derived from frozen blood plasma. Cryoprecipitates are able to distill certain clotting factors in the blood into concentrated amounts: things like fibrin, which is a glue-like protein that helps platelets to stick together.

Now, only rarely are plasma derived products used to treat bleeding disorders in the U.S., Canada and other non-third world nations, and they are heat-treated. The majority are now produced in labs and are called recombinant factors since they are composed of recombinant genes and proteins.

“Bleeding disorders” is a general term for a wide range of medical problems that lead to poor blood clotting and continuous bleeding. Medical terms referring to bleeding disorders include coagulopathy, abnormal bleeding and clotting disorders. There are many types of bleeding/clotting disorders that affect the blood’s ability to heal wounds and stop bleeding.

A person with a bleeding disorder has a tendency to bleed longer. The disorders can result from defects in the blood vessels or from abnormalities in the blood itself. The abnormalities may be in blood clotting factors or in platelets. Unfortunately, the liver is intimately involved in the production of clotting factors and platelets; so having hepatitis C on top of a blood disorder is not a good thing.

Because bleeding disorders can cause excessive bleeding in joints (think of a bruise that gets bigger and bigger and doesn’t go away), many people with bleeding disorders suffer from pain and some become permanently disabled, as the joints become destroyed.

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Blood clotting, or coagulation, is the process that controls bleeding. It changes blood from a liquid to a solid. It’s a complex process involving as many as 20 different plasma proteins, or blood clotting factors. Normally, a complex chemical process occurs using these clotting factors to form a substance called fibrin that stops bleeding. When certain coagulation factors are deficient or missing, the process doesn’t occur normally.

Causes of Blood Disorders
There are many causes of blood disorders:

• Von Willebrand’s disease, which is an inherited blood disorder, thought to affect between 1% and 2% of the population

• Immune system-related diseases, such as allergic reactions to medications, or reactions to an infection

• Cancer, such as leukemia, which is a blood cancer

• Liver disease

• Bone marrow problems

• Disseminated intravascular coagulation, which is a condition often associated with child bearing, cancer, or infection, in which the body’s clotting system functions abnormally

• Pregnancy-associated eclampsia, also known as severe toxicity of pregnancy

• Antibodies, a type of immune system protein, that destroy blood clotting factors

• Medicines, such as aspirin, heparin, warfarin, are drugs used to break up blood clots.¹

Congenital bleeding disorders are very rare, and with the exception of hemophilia and von Willebrand’s disease, education about them has not been a priority of the medical community. Most have only been discovered and described in the past few decades.

Types of Blood Disorders
There are many different types of bleeding/clotting disorders. Some are hereditary (genetic), and others idiopathic (unknown origin). Some are the result of autoimmune triggers (for example overstimulation of the immune system by interferon when on treatment for HCV) For an overview of blood disorders (also called hematologic diseases), see the overview at MedlinePlus.²

Bleeding Disorders
As we all know, advanced liver disease can cause bleeding disorders as the liver becomes too diseased to manufacture clotting factors and hormones to make platelets. In this regard, a liver transplant may also cure some bleeding disorders as well, since the cause of some of these is a genetic defect in the liver itself.
Fibroscan
Fibroscan is based on ultrasound elastography technology using a machine that sends a vibration wave through the liver. It is a painless and a safe procedure that is recommended for people with bleeding disorders to gauge the level of hepatitis C disease progression.

Clotting Disorders

Thrombophilia
Thrombophilia is the opposite of hemophilia. While people with hemophilia have an increased tendency to bleed, people with thrombophilia have an increased tendency to clot. Just as hemophilia is caused by an abnormality of a blood clotting factor, some forms of thrombophilia are also caused by an abnormality or deficiency of a blood-clotting factor.1

Thrombotic Thrombocytopenic Purpura (TTP or Moschcowitz Syndrome)
TTP is a rare disorder of the blood-coagulation system, causing extensive microscopic thromboses to form in small blood vessels throughout the body.5 This disorder is associated with hepatitis C ribavirin can cause hemolytic anemia, which affects red blood cell counts.

HCV Treatment
Treatment It is now recommended that people with bleeding disorders who have received blood or plasma derived products should be tested for hepatitis C. HCV RNA (viral load), HCV genotype and a FibroSure test for potential fibrosis/cirrhosis test should be included. Every person with bleeding disorders who test positive for chronic hepatitis C should be evaluated for direct-acting antiviral therapy.

Conclusions
Today, with the advent of recombinant factors and heat treatment, the chances of getting hepatitis C have all but disappeared for those suffering from blood disorders. There are a few bleeding disorders that still require whole plasma infusion, and there is always the HCV window period6 to worry about, but the risk is considered to be less than 1 chance per 2 million units of transfused blood. However, persons with bleeding disorders are still at risk for hepatitis C.

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>OTHER NAME</th>
<th>INCIDENCE</th>
<th>BLEEDING SEVERITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor I</td>
<td>Fibrinogen</td>
<td>1 in 1,000,000</td>
<td>Usually mild, except with complete absence of fibrinogen</td>
</tr>
<tr>
<td>Factor II</td>
<td>Prothrombin</td>
<td>1 in 1,000,000</td>
<td>Usually mild</td>
</tr>
<tr>
<td>Factor V</td>
<td>Parahemophilia</td>
<td>1 in 1,000,000</td>
<td>Usually mild</td>
</tr>
<tr>
<td>Combined FV and F VIII</td>
<td></td>
<td>1 in 1,000,000</td>
<td>Usually mild</td>
</tr>
<tr>
<td>Factor VII</td>
<td>Alexander's</td>
<td>1 in 1,000,000</td>
<td>Severe when Factor VII levels are low</td>
</tr>
<tr>
<td>Factor VIII</td>
<td>Hemophilia</td>
<td>1 in 10,000</td>
<td>Severe when Factor VIII levels are below 1%</td>
</tr>
<tr>
<td>Factor IX</td>
<td>Hemophilia B</td>
<td>1 in 50,000</td>
<td>Severe when Factor IX levels are below 1%</td>
</tr>
<tr>
<td>Factor X</td>
<td>Stuart-Prower</td>
<td>1 in 500,000</td>
<td>Moderate to severe when Factor X levels are below 10%</td>
</tr>
<tr>
<td>Factor XI</td>
<td>Hemophilia C</td>
<td>1 in 100,000</td>
<td>Mild to moderate when Factor XI levels are below 15%</td>
</tr>
<tr>
<td>Factor XIII</td>
<td></td>
<td>1 in 3,000,000</td>
<td>Severe</td>
</tr>
</tbody>
</table>

Source: Canadian Hemophilia Society4

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African Americans — CONTINUED FROM PAGE 3

from shared needles, unsafe tattoos, and medical procedures in which the protocols have not been followed, i.e., improper sterilization, re-use of single use items.

For additional guidelines visit:

References:
3. www.hemophilia.ca

Related publications:

HCV Medications Blog
http://hepatitismedications.hcvadvocate.org/

HCV Genotype, Quasispecies and Subtype

HCV Advocate Drug Pipeline

For more information

• Centers for Disease Control and Prevention
  www.cdc.gov/Hepatitis

• National Digestive Diseases Information Clearinghouse (NDDIC)

• Veterans Administration:
  http://www.hepatitis.va.gov/as a standard one

• InQuick Reference Guide - FDA Approved Medications
  http://hcvadvocate.org/treatment/drug-pipeline/

A GUIDE TO UNDERSTANDING HCV
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