



Superbug

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Clostridium difficile The Deadly Superbug Diarrhea

This year 700,000 people will die from superbug infections. Superbugs are **bacteria** that have become **resistant to most antibiotics**. There are many of them and they are getting stronger. By the year 2050 they estimate 10 million deaths per year! That makes them one of the major health threats – moving ahead of cancer and many other diseases. Last year in the USA MRSA (a superbug that causes skin infections) killed more people than AIDS.

One of these superbugs *Clostridium difficile* (frequently called C diff by medical personnel) can cause a deadly diarrhea. These bacteria if ingested can spread and become established in the colon among all of the normal bacteria.

Did you know there are more microbial cells in your body than there are human cells – of course they are much smaller than human cells – but as far as numbers go, our cells are vastly outnumbered by the microbes living in and on us. Generally, they are friendly and beneficial organisms that perform essential life functions for us. It would be very difficult for us to live without their constant services. (But that is a story for another time.)

Now if we have a few C diff living in our colon along with all of the other billions of bacteria it will not create much of a problem because all of the good bacteria will keep this bad superbug under control so it cannot spread or cause much of a problem for us. But suppose we take a

course of antibiotics for some infection – maybe the doctor prescribed some Cipro for bronchitis or pneumonia – as the antibiotic pills dissolve and pass through our intestines they also are killing all of the good bacteria living there. Now C diff’s super powers come into play – it is resistant to Cipro (and most other common antibiotics) so it is not killed. But since all the good bacteria that were keeping it under control are now dead it can multiply without restraint. Doctors will frequently refer to a C diff infection as antibiotic related diarrhea because it always seems to follow a course of antibiotics.

C diff is not only a superbug it is also a bad bug. It is related to *Clostridium tetani* a common bacterium found in the soil that makes a strychnine like toxin the produces deadly muscle spasms. You have probable had a tetanus vaccination to protect you against this bad bug. C diff is also related to *Clostridium botulinum* that makes a deadly toxin responsible for botulism poisoning that causes a fatal paralysis. Like its cousins, C diff also produces several toxins and if it is spreading uncontrollably in your colon these toxins can be deadly.

Toxic megacolon

These toxins cause a high fever, severe abdominal pain and a bad diarrhea with a distinctive foul odor. If you looked inside the colon you would see thick yellow plaques composed of inflammatory debris and white blood cells covering much of the mucosal surface. We call this condition **pseudomembranous colitis**. These patients are quite sick and are hospitalized on IV fluids to try and keep them alive while we try to control the infection.

If not controlled the toxins can cause further damage to the colon resulting a condition called **toxic megacolon**. The colon becomes badly dilated and the wall is severely inflamed. These patients can be in septic shock. Sometimes they will surgically remove the colon trying to save their life.

Years ago we used to consider C diff to be a hospital-acquired disease – but not anymore – now it is commonly occurring outside the hospital and is considered a community-acquired disease.

Where do the super bugs come from?

The over use of antibiotics – particularly in large-scale animal farming. Many cows or poultry are crowded into small places with less than ideal sanitation and they are all placed on multiple antibiotics to try to keep them well and alive until they can be slaughtered for market. So as the common bacteria that are susceptible to these antibiotics die off some bacteria can develop immunity or resistance to various antibiotics and survive. These resistant bacteria are frequently resistant to multiple antibiotics and have thus become superbugs. And these superbugs can multiply and thrive in the crowded antibiotic treated conditions on these large animal farms.

C diff is found in calves, cows, chickens, turkeys and pigs. They tested meat from supermarkets and found toxigenic C diff in 42% of the samples. The highest risk was from turkey meat. It was also very high in chicken.

But isn't the meat safe if we cook it?

Cooking kills most bugs – but C diff isn't like most bugs – it's a superbug with super powers and is not killed by cooking. Meat thermometers are marked at 165 degrees F and cooking the center of the meat at this internal temperature is considered the safe recommended standard for cooking meat. You could grill a chicken for 2 hours with the core at this temperature and not phase the C diff. Cooking does not kill it. It just turns into spores that grow back into C diff as soon as they are inside you.

Hand Sanitizer?

Alcohol based hand sanitizers that kill 99.99% of all germs are in common use by many as way to prevent getting or spreading various infections. Once again, this superbug's super powers triumph. Hand sanitizers cannot kill it. [That is why they can't advertise as 100% effective!] And studies show the spores can be spread even by a handshake. In the hospital, extensive isolation procedures are followed to try to prevent the spread of this superbug. But what about

in the community? What is your risk at a restaurant? Or the supermarket? Or around others who may have touched contaminated meat?

What can be done about this superbug?

It is not invincible – like Ebola it can be killed by incineration and by bleach.

In the hospital, we currently give patients two strong antibiotics that it is not yet resistant to: Flagyl and Vancomycin. This can help us to get it under control although it does not usually completely eradicate it – relapses are common. Taking probiotics to help build up the good bacteria in the colon can be very helpful.

A new very effective treatment is the **stool transplant**. They fill the colon of the infected patient full of stool from a healthy person using an enema. These healthy bacteria then do their job and the C diff is put back in its place and the symptoms subside.

Avoiding unnecessary antibiotics in the future will play a key part in our warfare against these superbugs. While antibiotics can be lifesaving in certain situations, they are not without their risks. For minor infections, drink lots of water, eat fresh fruit liberally, avoid any form of refined sugar, get plenty of sleep, high dose vitamin C can be helpful, and trust God as you use his simple natural remedies.

And of course – the simple vegan lifestyle given to us by God at the time of our creation is the best policy for us as a nation and individually if we truly want to survive in our war against the superbugs.