

From VOA Learning English, this is **Science in the News**. I'm Bob Doughty.

And I'm Faith Lapidus. Today we tell about Ebola hemorrhagic fever and a promising treatment for the disease. We also have a report about tuberculosis bacteria. Scientists now say human tuberculosis was present in Africa tens of thousands of years ago. We also tell about progress against a disease that threatens 20 percent of the world's population.

Medical researchers have developed a promising treatment for Ebola hemorrhagic fever. The experimental compound could become the first successful treatment for Ebola. It helped even after signs of the disease developed.

Ebola hemorrhagic fever is spread by infected bats in western Africa. Right now, some forms of the virus kill about 90 percent of the people they infect. That is because by the time people show Ebola symptoms, little can be done to save them. The signs include high body temperature, breathing problems, and severe pain in the head or other body parts.

American scientists have developed an experimental treatment that could save lives. The researchers work with the Army Medical Research Institute of Infectious Diseases. Researcher James Pettitt says more than 40 percent of rhesus macaques were cured after they had already developed severe symptoms. The animals were treated with protective antibodies taken from specially grown tobacco plants. The treatment is called MB-003.

In an earlier experiment, MB-003 prevented symptoms in 100 percent of the monkeys when given one hour after coming in contact with the disease. This time, says Mr. Pettitt, investigators waited more than four days to treat the animals. They wanted to see how well the treatment might work in people who are infected with the disease.

The Ebola virus can quickly reproduce and overpower the patient's immune cells, which protect the body against disease. But, MB-003 stops the virus by targeting a protein on its outer surface. This activates the person's natural antibodies to kill infected cells.

James Pettitt says the American government is interested in the treatment because of the possible use of the Ebola virus for bioterrorism.

“That’s how it’s labeled by the Centers for Disease Control. So our mission is to protect the war fighter from any potential outbreaks from this in indigenous regions where they might be posted.”

He says researchers now want to try to increase the compound’s effectiveness, at the same time making sure it is safe and effective in humans.

A report about MB-003 as a possible treatment for infection with the virus was published in the journal Science Translational Medicine.

Scientists say they now have evidence that tuberculosis first appeared in Africa at least 70,000 years ago. Their finding conflicts with the current understanding of when and how tuberculosis came into being.

Most scientists say the bacteria first appeared in animals only 10,000 years ago and later spread to human beings.

But now an international team of researchers claims it was the other way around. They say TB appeared in humans much earlier -- 60,000 years earlier -- and then spread to animals.

The team is under the direction of Sebastien Gagneux of the Swiss Tropical and Public Health Institute. He explains why it is important to study the history of TB.

“The idea is that by learning from the past and how infectious disease evolves over time, this potentially could give us some clue about the future of the TB epidemic.”

He notes that humans and TB did more than just grow side by side.

“I think that’s a nice way to put it. Maybe you can even say one inside the other. Imagine where the TB bacteria live, which is actually inside human bodies. Yes, side by side, or one inside the other.”

Scientists know that people have bacteria on them and in them all the time. In fact, the bacteria help keep us alive. Researchers are attempting to learn if tuberculosis bacteria were always harmful to humans.

Scientists want to know why only five to 10 percent of the estimated two billion people infected with the bacteria actually come down with active tuberculosis. Another question is whether the bacteria were at one time good for human health?

“This idea that maybe carrying these bacteria in this latent form could potentially be beneficial because it might protect against other diseases. Again, that’s a very provocative hypothesis, which we, however, cannot completely neglect.”

Professor Gagneux says TB left Africa when humans did, about 65 to 70 thousand years ago. Then, about 10 thousand years ago, came the Neolithic Demographic Transition. That is the period when people started to develop agriculture and to domesticate, or train, animals. But, it was also a time when diseases jumped from domesticated animals to humans for the first time.

Professor Gagneux says for many years people thought that TB took the same path – from animals to humans. But, the research shows that TB first appeared in humans before the domestication of animals. In fact, the bacteria learned to live inside people and now cannot survive by itself in the environment. There was another important development during the Neolithic Demographic Transition. Humans started to form communities with lots and lots of people. That would have been ideal for the spread of tuberculosis through the air from person to person.

Professor Gagneux says before settlements, in the hunter-gatherer days, TB may not have been as deadly.

“Overly deadly would be a bad strategy for any pathogen because you might just kill off all susceptible hosts and you might end up with nobody else to infect.”

After humans left Africa, they started to change in appearance as they reacted to new environments in other parts of the world. TB also changed and now there are many different forms of bacteria that cause the disease. The one found in South Africa differs from that found in China, but Africa still has the greatest number of TB strains. Researchers hope that knowing the history of TB will help in the development of new drug treatments and vaccines. Now, the number of drug-resistant TB cases is growing. The knowledge may also help predict what the scientists are calling “future patterns of the disease.”

Scientists are working on ways to stop a disease that threatens one-fifth of the world’s population. Over 120 million people are infected with lymphatic filariasis, also known as elephantiasis. The disease is found mainly in Southeast Asia and Africa. It affects the lymphatic system, which is a major part of the body’s natural defenses for fighting disease.

Elephantiasis can cause swelling, or enlargement, of skin and tissue. The cause is a tiny worm that enters and lives in lymphatic tubes for six to eight years.

Scientists have been able to demonstrate that the most common cause of elephantiasis can be stopped. They are urging those at risk to sleep under nets treated with chemicals that kill a common insect: the mosquito.

Lisa Reimer teaches at the Liverpool School of Tropical Medicine. She formerly served in Papua New Guinea as part of a team studying the disease. Doctor Reimer says she was surprised at how effective anti-malaria bed nets covered with insecticide could be at fighting the disease.

“Filariasis is only picked up by mosquitoes late in the evening, so this is the time when people are more likely to be protected by their bed nets. So we found that bed net use actually is a greater barrier against filariasis transmission whereas malaria transmission may still be occurring outside the times when the user is under the net.”

Doctors normally use drugs to fight the disease. Lisa Reimer says doctors in Papua New Guinea gave the drugs to people of five villages. She says this treatment nearly ended the threat from the worm to humans. But the drugs did not stop the threat from mosquitoes.

The treated nets block female mosquitoes from securing blood, which is necessary for them to reproduce. The insecticide also cut the life of the insects in half.

The World Health Organization has set a goal of stopping lymphatic filariasis as a public health problem by the year 2020. The WHO estimates that 1.4 billion people in 73 countries are at risk of the disease. Children are often infected, but they do not show signs of the disease until later in life.

This Science in the News was written by Milagros Ardin and Kim Varzi. I'm Faith Lapidus.

And I'm Bob Doughty. Join us again next week at this time for more news about science on the Voice of America.

