



Searching for Syphilis

The results of Rivenhall women's test

Narrator:

Back in Medieval Europe, syphilis had not yet been recognised as a separate disease. Rivenhall woman's symptoms may well have made her a very unusual individual. The absence of other obvious cases of her disease within the community also raises the question of how long she may have lived there and whether she caught the disease elsewhere. In the hope of finding out more about her life, Mays sends two of her teeth, and a control soil sample taken from the churchyard, to the British Geological Survey labs in Nottingham.

Paul Budd:

What were going to be doing is analysing the enamel of the tooth, that's the hard outer part of the tooth. The enamel forms in - when it forms exactly depends on what tooth you're looking at. But the nice thing about the enamel is that once it's formed it locks up those elements which get incorporated into it and really preserves them throughout life and long after death as well. So what you're looking at really is a kind of time capsule.

Narrator:

Isotopes of oxygen and strontium locked within a tooth reveal a picture of where an individual was living when the tooth formed.

Carolyn Chenery:

Well the Oxygen is really exciting because it relates directly to the water that you drink, and that can be related to the climate in which you lived. The Strontium in contrast relates to the geology; the ground that you were raised on, and when you combine the two, you get quite a useful bit of information about the precise place that a person was raised.

Narrator:

As Rivenhall woman's teeth undergo new tests, the results of the DNA analysis are back. But the treponemes are not about to give up their secrets easily.

Abi Bouwman:

Well the good news is that there is DNA in the Rivenhall skeleton.

She has actually amplified human DNA, which is a good sign - it means DNA does survive within her and it can be amplified. Unfortunately when we use the treponemal primers they amplified a lot of other DNA, which when we sequenced them means that we can't actually see whether we have treponemal DNA or not. If I show you this you can see here this is the kind of sequence we would like to get - it's very clear with very clear peaks. But when you look at what we've got with Rivenhall, we've got very mixed sequence which indicates that there's lots of different DNA. It's possible that treponemal DNA is within one of these sequences, but because there's so many, so much other DNA it's impossible to say whether it's there or not.

Narrator:

The extra peaks in the read out are probably being caused by the DNA of unknown bacteria.

Abi Bouwman:

This other bacteria is probably likely to come from the burial environment, although it could also be things within the Rivenhall woman that she carried - we all carry millions of bacteria that don't do anything and it could possibly be something to do with this.

Narrator:

Treponemal DNA is not easy to find in ancient remains. Although the disease can cause massive damage to the skeleton very few of the bacteria are actually preserved within the bone.

Sheila Lukehart:

There are a lot of treponemes that are present in the early stages of syphilis in the skin lesions, but the host immune response does a very, very good job of clearing those organisms, 99.99% of the organisms are cleared by the immune response, only a few organisms remain .

Positive results are meaningful as I said, but a negative result doesn't rule out syphilis.

Abi Bouwman:

Obviously I'm gonna keep trying with this skeleton and with other skeletons to try and get treponemal DNA out of them, and try to answer the question of whether syphilis is in Europe before Columbus.

Narrator:

DNA analysis may soon settle the argument over whether venereal syphilis was in the Old World before the return of Columbus.