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www.reachmd.com
info@reachmd.com
(866) 423-7849

Heart Disease in Ancient Egyptians

You're listening to Reach MD, the channel for medical professionals. Welcome to Heart Matters where leading cardiology experts explore the latest trends, technologies and clinical developments in cardiology practice. Your host for Heart Matters is Dr. Janet Wright, Senior Vice President for Science and Quality, for the American College of Cardiology.

Dr. Janet Wright:

It's widely believed that modern behaviors of inactivity, stress, and poor diet contribute to the development of cardiovascular disease, but history may suggest otherwise.

What can ancient Egyptian mummies tell us about cardiovascular disease?

Our guest today is Dr. Randy Thompson, cardiologist at St. Luke's Hospital, Mid-America Heart Institute in Kansas City, Missouri. Welcome Dr. Thompson.

Dr. Randall Thompson:

Thank you. It's nice to be here.

Dr. Janet Wright:

So, what does a cardiologist from Kansas City know about ancient mummies?

Dr. Randall Thompson:

Well, several friends, colleagues and I traveled to Cairo and performed CT scanning on ancient mummies. So, in the process I've learned quite a bit. Our study was published in JAMA recently. We found that on CT scans, there was atherosclerotic calcification in the aorta and some of the large vessels. Clearly these ancient Egyptians had atherosclerosis, despite a very different lifestyle than what we have. The disease seems to have been quite prevalent. It was quite easy to find the disease in the ancient relics.

What was amazing was that the bodies were so well preserved that parts of the cardiovascular system were very much intact and on CT scan, we could detect calcification, atherosclerosis with a high level of confidence.

Dr. Janet Wright:

Someone was on vacation originally and just happened to start to wonder about calcification or mummy heart disease? How did this come about?

Dr. Randall Thompson:

The project got started when two colleagues, Greg Thomas and Adel Allam were in The Museum of Antiquities in Cairo. Dr. Allam lives in Cairo. The two of them came upon a placard at the display of the mummy Merneptah.

Merneptah lived to be 60-something years old and the placard said that he had a number of ailments including atherosclerosis. Dr. Thomas thought, how did they know? Surely this is just conjecture. I agreed.

It turned out that there is a CT scanner behind the museum in Cairo that had been donated by National Geographic and Siemens. That scanner had been used some to examine the mummies and it seemed like a perfect project to propose to look for coronary calcium. As a secondary objective, we were to look for vascular calcifications.

Dr. Janet Wright:

Bow, has heart disease been studied in any other ancient populations?

Dr. Randall Thompson:

Not that I know of. There had been CT scans of ancient human bodies. The Ice Man who was found in the Alps in the 1990s was CT scanned and the report indicates there was atherosclerosis in the abdominal aorta, but this is the first comprehensive study, or focused imaging study for cardiovascular disease, one of the first studies where CT scanning was done in a methodical scientific way.

Dr. Janet Wright:

What do you know about the mummies that you studied?

Dr. Randall Thompson:

We knew the identity of 16 of them. They were all priests or members of the pharaoh's household. They were upper class individuals if you will. Some of them we knew a fair amount about them. On the sarcophagus was written the names of their parents for example. In one case the employer was the queen so, a historical figure if you will. After looking at the CT scans and reading about them as individuals, we almost felt like we got to know them. They became patients almost.

Dr. Janet Wright:

I bet. You were able to estimate their age? Or their age had been estimated by someone else?

Dr. Randall Thompson:

We got some help, but through x-rays you can estimate the age at the time of death within five years or so.

Dr. Janet Wright:

So, both male and female. You had...I hate to call them subjects, you had mummies that were between 40 and 50 perhaps when they died?

Dr. Randall Thompson:

Correct. We tried to get older lived individuals. In terms of selecting the mummies to scan, we had a lot of help from the Egyptologists at the museum, wonderful scholars. They went through their archives and tried to find mummies where they thought that the heart would be intact and would be older. We didn't want to scan children. We were looking for atherosclerosis or even coronary calcium. For the most part, we were able to get intact mummies, although the heart was present in only four of the 22 mummies that we had.

Dr. Janet Wright:

What do we know about the typical diet for these folks?

Dr. Randall Thompson:

Well, that's a good question. Clearly the wealthy people ate meat. We think of the ancient Egyptians as having a different lifestyle than we do. Certainly they should have gotten more exercise, they had to walk everywhere. They didn't have tobacco, didn't have trans-fats for example, but they did salt their fish. So, they may have had a higher sodium diet than we're aware of or than we do.

The rich people, such as the priest who ate the sacrificial food, did eat plenty of meat, geese and so forth. From the hieroglyphs on the tombs, we can tell they ate fowl, they ate fish from the Nile, they had some domesticated animals.

The poor people presumably ate a simpler diet.

Also grains were well developed. This was not a hunter gatherer society. This was an agricultural society. Cereal grains had been in production and had been cultivated for a long time. They ate a diet that included cereal grains, meats, fish, perhaps salt. At least the rich people may have had a relatively rich diet, richer than you would think of from a hunter gatherer population.

Dr. Janet Wright:

If you're just joining us, you're listening to Heart Matters on Reach MD, the channel for medical professionals. I'm your host Dr. Janet Wright and our guest today is Dr. Randy Thompson, cardiologist at St. Luke's Hospital Mid-America Heart Institute in Kansas city, Missouri.

We're talking about heart disease in ancient Egyptian mummies. There is no way to estimate how common a cardiac death was in these people, not from this study, but from associated studies or anything else that you learned, can you fill our listeners in on the likelihood of death from cardiovascular stuff?

Dr. Randall Thompson:

Our study doesn't really give us that information. We don't know if these mummies actually suffered from cardiovascular disease, heart attacks or whatnot. We did find that atherosclerotic changes were not difficult to find in the mummies that we scanned though. We had one mummy where there was calcification in what looked like the myocardium and I hypothesized that it might have been a calcified myocardial infarction, but it wasn't. It was only one case and it wasn't clearcut enough that we could draw a consensus.

In terms of how often the ancient Egyptians actually had angina or heart attacks and so forth, there's really almost no data. There are some interesting written records from the ancient days though. There are some papyri that have medical writings on them. A papyrus was named after the person who discovered it or the person who bought it.

The two famous medial papyri are the Ebers papyrus and the Smith papyrus. In the Ebers papyrus there is a description of chest pain being an ominous sign that death would follow. That would suggest that the ancient Egyptian physicians knew something about chest pain and sudden cardiac death. We would of course quickly identify that as being angina petrous and _____ (7:44) from a cardiovascular...cause myocardial infarction. But that's the only mention that I'm aware of in the ancient literature. So, that's the only answer I can give you.

Dr. Janet Wright:

We tend to think about atherosclerosis as being a modern disease. We're pretty quick to blame the trajectory of lifestyle choices that we've all made, you've mentioned some of them, diets that are high in fat, many of us sitting at computer terminals instead of being out running and then, the rise of course of cigarette smoking. None of those things existed in those days, we think. What do you think these finding suggest about the ideology of the disease?

Dr. Randall Thompson:

Well, it to me suggests that maybe genetics are a bigger factor than we like to admit. Perhaps we've focused so much on risk factors that we tend to forget that the disease is something that can occur naturally with ageing, and likely will occur naturally with aging if we live long enough.

Perhaps in a way we've oversold risk factors. Maybe we've made people feel guilty because they have a heart attack or a stroke and some of this could have only been delayed a bit by more careful attention to risk factors. Perhaps patients feel a bit more blame than they should. That's one thought I had. Maybe this is more genetics than risk factors, at least in respect to the way we've been thinking.

That also brings out the thought, could we be missing something? Perhaps there is something that is unexplained that's in the environment of the ancients and in our environment that we haven't really focused on.

Dr. Janet Wright:

That's an intriguing thought because the calcification that you detected by CT scanning really reflects inflammation, correct?

Dr. Randall Thompson:

Well, when tissue in an oxygen rich environment is injured, part of the healing process, the inflammatory healing process is calcification. We have calcification in atherosclerotic plaques commonly, but it implies inflammation, perhaps ageing of the cardiovascular tissue and that's what we're picking up on the CT scan.

Dr. Janet Wright:

Before we give out listeners the right to lie around and eat with abandoned...perhaps you could emphasize what limitations there are with this study.

Dr. Randall Thompson:

As we brought up a moment ago, we didn't determine whether ancient Egyptians actually had heart attacks or had symptomatic cardiovascular disease. To your point, it's clear that exercise, lower cholesterol, drugs for secondary prevention are beneficial in our society. That with reasonable diet, exercise and some might add, a good attitude promote longevity. So, that doesn't negate all the information that we have about healthy lifestyles. That's what I would say would be our limitations.

Dr. Janet Wright:

Has this piqued your interest in studying this population further?

Dr. Randall Thompson:

Indeed. We've reassembled our group to do some more CT scanning of mummies and have found the subject to be fascinating and hoping to discover more.

Dr. Janet Wright:

I'm wondering about the incidents of valvular disease for example. Are you going that far?

Dr. Randall Thompson:

So far the hearts we've seen have been too distorted to be able to tell much about heart disease. In fact, at this point we've not been confident about coronary calcium either. We're hoping in the next expedition to find more hearts and perhaps we can say something about them. I don't know yet though. So far the specimens we've seen have not been in a state where you could make a conclusion about valvular heart disease.

Dr. Janet Wright:

Well, in our closing minutes, I would ask for you to summarize for our listeners what you observed.

Dr. Randall Thompson:

Well, our group scanned 20 mummies in a week at The Cairo Museum of Antiquities. We were able to review the CT scans of two other mummies that had been scanned earlier. We found that cardiovascular tissue was present in 16 of them. Of the 16 with cardiovascular tissue, seven had no evidence of atherosclerosis. Now, remember we didn't see the whole cardiovascular system, but of the snippets that we saw, there was no atherosclerosis. Five had definite atherosclerosis and four had what we would call, probable atherosclerosis.

Now if we could see the artery, we could see a thickening of the arterial wall that had calcification in it, then we said, this looks all the more like atherosclerosis does on a CT scan in a modern human patient. That's definitely atherosclerosis. If we saw calcification along the course of where an artery should be, then we said that's probable atherosclerosis. So, of the 16 mummies with cardiovascular tissue, five had definite atherosclerosis and four had probable atherosclerosis.

Atherosclerosis was much more common in those mummies that had lived to be over age 45, seven out of eight had atherosclerosis and in the mummies that were less than 45 at the time of death, only two out of eight had atherosclerosis.

So, we found that the disease seemed to be easy to detect, especially in older lived mummies and would point out that these mummies were, for the most part, upper social status individuals who presumably had a richer diet than the common man of the day.

Dr. Janet Wright:

So Randy, what would be the most striking finding from your study?

Dr. Randall Thompson:

Well, our study showed that atherosclerosis is a disease older than Moses. It's been with us, it's a genetic hand-me-down that we have to deal with.

In terms of other populations that we might study, our expedition that we are planning hopes to look at individuals who were not wealthy or upper social status and who presumably ate a simpler diet. We're also hoping to study mummies that had hearts in tact so we can perhaps say something about coronary calcium and maybe even valvular heart disease.

Dr. Janet Wright:

We've been talking with Dr. Randy Thompson about heart disease in ancient Egyptian mummies. Dr. Thompson, thank you for being our guest today.

Dr. Randall Thompson:

Thank you for having me.

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