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High-Tech Cardiovascular Risk Assessment

HIGH-TECH APPROACHES TO ASSESSING VASCULAR RISK

You are listening to ReachMD XM 157, The Channel for Medical Professionals. Hi, this is Dr. Thomas Bersot, President of the National Lipid Association, and I would like to welcome you to Lipid Luminations, hosted by Dr. Larry Kaskel and presented by the National Lipid Association.

My guest today is Dr. James Ehrlich, currently the Chief Medical Officer of Atherotech Inc., a leading cardio-diagnostic company based in Birmingham, Alabama. James is also an authority in the integration of imaging physiologic and laboratory technologies with conventional office-based assessment.

DR. LARRY KASKEL:

Dr. Ehrlich, welcome back to Lipid Luminations.

DR. JAMES EHRLICH:

My pleasure, thank you.

DR. LARRY KASKEL:

Most physicians, as you know, do a nice history, they do a good physical, they do the appropriate lab tests. They might do a stress test to assess risk, although I don't know what that really accomplishes and they think that's enough, do you?

DR. JAMES EHRLICH:

Well, my experience has been that the office-based examination in the sense of cardiovascular disease assessment utilizes the Framingham risk score is completely inadequate.

DR. LARRY KASKEL:

You can flip a coin, won't have a better result than using the Framingham risk.

DR. JAMES EHRLICH:

That's right, and it turns out that the overwhelming majority of cardiovascular disease burden is in people who would have been considered at low risk, not even intermediate risk by Framingham, so for example, 82% of women who sustained a cardiovascular event in the United States would have been considered at such low risk a week before that devastating event that they wouldn't even qualify for pharmacotherapy, so we obviously can't rely solely on a history and physical and it seems to me amazing that the same physician who would never consider telling a patient who is 50 years old you don't need a mammogram, I know you don't have breast cancer based on my physical or you don't need a colonoscopy , still has trouble adopting higher tech types of test for assessing cardiovascular risk, which will kill 10 times more women than breast cancer.

DR. LARRY KASKEL:

Well, I think that's because we have been brainwashed that if your lipids are fine, that's all that matters.

DR. JAMES EHRLICH:

That's right, and I think physicians pretty much feel that they know who is at risk in their practice and so I challenged physicians on the next 10 patients that show up in the emergency room, calculate the Framingham score and be humble and say how is that this is a person I played golf with the other day yes, they were a little overweight or they had a little hypertension, but obviously how could I have known that they were at this high risk and I think we need to be much more humble as physicians in recognizing that history and physical, which are important and conventional laboratory tests still don't give enough information for individual risk assessment. They are really only good for populations.

DR. LARRY KASKEL:

You were a pioneer in terms of doing electron beam computed tomography and initially when it came out all the cardiologists pooh-poohed it and it seems like now they are all coming around and saying this is a good test for assessing the burden of disease.

DR. JAMES EHRLICH:

Well, yes and no. I think the interest has been in CT angiography and this has brought in a large group of cardiologists and radiologists who had formerly dismissed the value of plaque imaging. Unfortunately, a good percentage of them are still luminologists, they are fascinated by CT angiography because of the gorgeous pictures that can show stenosis and have somewhat neglected the value of looking at atherosclerosis or looking at calcified plaque in the 100s of studies that have looked at how predictive, including the recent MESA trial, how predictive in every major ethnic group the coronary calcium score is, so there are physicians that are getting more interested. Certainly hospitals are doing this much more commonly with the multislice scanners and I do see a gratifying increase in acceptance. Unfortunately, managed care has not done it.

DR. LARRY KASKEL:

That is, they won't pay for a 150-dollar test.

DR. JAMES EHRLICH:

They still won't pay for this, and that's been depressing.

DR. LARRY KASKEL:

A real case, I had a patient I saw yesterday. He has been on Vytorin for probably 10 years. His lipids are fine. He had an EBCT 2 years ago with a calcium score of 1. We repeated it, I got the results today. His calcium score now is 10; 2 years later. My understanding is that you just see a progression of 30% per year, so he should really only be at, you know, about 2, am I correct?

DR. JAMES EHRLICH:

Well, not really, and it turns out you are correct, but the problem is that a score of 1 could easily be a score of 0 and that you need to understand that somebody goes from a score of 2 to a score of 4 has not doubled. So there is a concept at interscan variation. I coauthored the only publication that can determine with only 1% false positive rate whether a score going from, let's say 2 to 10, represents true progression or is it just interscan variation and so this a formula that's published in a radiology journal. We use it for most of our research because as you can imagine we are going to tell a patient whose score went from 3 to 6 that I am sorry you've doubled, turns out that that's well within the accuracy of these technologies and the person may not have changed at all.

DR. LARRY KASKEL:

All right so he is coming in next week, what do I tell him, 1 to 10?

DR. JAMES EHRLICH:

I would tell him that it's now likely you do have very, very mild, we call it minimal up to 10, atherosclerosis, and I would reassure this person that the fact that it is minimal, we're going to treat you at least as aggressively as I would have treated you if you didn't have the scan itself, and if he is a young person, and that score of 10 is greater than average for that young person. For example, a 40-year-old woman should have a score of 0, and so score of 10 tells us that they have a process that's going on more aggressively than it should be.

If you have just tuned in, you are listening to Lipid Luminations. I am your host, Dr. Larry Kaskel. My guest is Dr. James Ehrlich and we are discussing high-tech approaches to assessing vascular risk.

DR. LARRY KASKEL:

James, what makes a smooth muscle cell in a coronary artery decide to transform itself into a osteoblastic-like cell and make calcium?

DR. JAMES EHRLICH:

Well, this is a very, very complicated story. It is actually some people have spent their lifetime on vascular calcification mechanisms, but I can say is that it's now understood that as opposed to we learned in medical school that calcium is sort of a degenerative process. It is actually an active regulated process of bone formation with osteoclasts and osteoblasts and messenger RNA for osteopontin and osteonectin and so it's a lot more complicated and this represents true hardening of the arteries and we should think of calcification as a marker for atherosclerosis because one the common criticisms we get is that, well that represents stable plaque. We really have to look it as the tip of the iceberg. When you seen an individual with calcified plaque, it keeps company with a lot of plaque that may be vulnerable to rupture, so it's a marker for a situation. It represents an active process of laying down plaque, probably healing attempts and eventual calcification and that it may not be a stable situation at all.

DR. LARRY KASKEL:

Let's talk about some cool things on the horizon. What are you most excited about that you have seen that can be used in the office setting?

DR. JAMES EHRLICH:

One device that we've used successfully looks at arterial compliance or resistance and simultaneously looks at central aortic pressure. What's been very clear in the literature is that if a patient of yours has arteries that are stiff, there is considerably higher risk, but what has been somewhat new has been the idea that individuals with identical blood pressures have very, very different vascular hemodynamics. So, for example, the Conduit Artery Function Evaluation study, the CAFE study, is a sub-study of the Anglo-Scandinavian Cardiac Outcomes Trial or the ASCOT trial show that 2 different blood pressure lowering regimens produce different effects on the central aortic pressures despite similar effects on blood pressure. So the _____ device that we use is able to distinguish whether you're really lowering pressure and lowering central hemodynamics when you give somebody a blood pressure and it's able to help determine, which therapies would be most fruitful, so we can't regard somebody with a blood pressure of 120/80 as having the same hemodynamics as someone else with a similar blood pressure until we look at their central hemodynamics.

DR. LARRY KASKEL:

What is new in endothelial function and dysfunction that we can assess?

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