Et Tu, Olive Oil? Fats and Endothelial Function

Henry R. Black, MD, Robert A. Vogel, MD | May 10, 2013

Henry R. Black, MD: Hi. I am Dr. Henry Black, Clinical Professor of Internal Medicine at the Langone New York University School of Medicine and former President of the American Society of Hypertension. I am here today with my friend, colleague, and classmate, Dr. Robert Vogel.

Robert A. Vogel, MD: It is nice to be with you, Henry. As you know, I am with the University of Colorado in Denver doing work with the National Football League, and studying lipid therapies and also diet.

Dr. Black: I think one among the many interesting things you have looked at is the "Big Mac attack." You have done some studies that show that after having a Big Mac, endothelial function deteriorates fairly rapidly. Could you tell us about that and where you think that is going?

Dr. Vogel: Sure. When I die, they will put this Big Mac attack study on my tombstone.

There is no question that what you do daily -- whether it is what you eat, how you exercise, whether you watch television or videos, or whatever -- affects your endothelial function, and it affects it very quickly. One of the things we demonstrated several years ago is that if you eat a noxious kind of meal, a fast-food meal, your endothelial function worsens considerably. You lose about 50% of your endothelial function within 2 or 3 hours.[1,2]

Dr. Black: How do you measure that?

Dr. Vogel: We measure brachial reactivity. This is a noninvasive ultrasound test that measures the size of an artery and then looks at arterial changes after a stimulus, which is blood pressure cuff occlusion.

Dr. Black: Is anything else potentially detrimental aside from the fat in a diet?

Dr. Vogel: Many things are possibly detrimental or beneficial, but we found that what most depresses endothelial function is saturated fat.

Dr. Black: What about the Mediterranean diet? What do we know about that?

Dr. Vogel: That is a very hot topic right now. The PREDIMED study[3] from Barcelona included 7500 patients and showed about a 30% reduction in cardiovascular events with a Mediterranean diet. Of interest, I think they wanted to prove that it was the olive oil that was beneficial, but they got the same results whether participants consumed high amounts of olive oil or high amounts of mixed nuts. So they did not show what I think they intended to show.

We have looked at olive oil.[4] We found that olive oil may be not as bad as lard, but it does depress endothelial function, and that is because it also has high saturated fat.

Dr. Black: But that is a surrogate. With the Mediterranean diet study, they actually had outcomes -- something that is unusual in any diet study.

Dr. Vogel: This was the third and the best of the diet trials[3,5] because it was a prospective randomized trial of about 7500 folks. It was carefully controlled, and they looked at the cardiac events in an organized way. With a 30% reduction in cardiac events, which was statistically significant, I think we can be sure that a good diet does matter.

Dr. Black: Can we measure brachial reactivity in an office setting, to see what someone's endothelial function is?

Dr. Vogel: You can, with a caveat. It is in theory simple, but in actuality, it can be very difficult technically. We had a full-time technician doing this every day. It requires very careful measurements, to the tenths and hundredths of a millimeter, of the size of the brachial artery. It is technically demanding.

Dr. Black: There are several surrogate measures -- intima/media thickness (IMT), for example, which I was never too impressed by. That has fallen out of favor in a lot of ways. It seems to me that short of outcomes, real outcomes, there is not much that we can do. Would you agree with that?

Dr. Vogel: I absolutely agree with that. For any new class of drug today, the US Food and Drug Administration says that you have to have hard outcomes. You have to look at myocardial infarction, stroke, or death. This is because we have learned that some of these intermediate endpoints can look pretty good, but when you actually put it in a population you find some disturbing trends.

Dr. Black: Do you think this requirement to have an outcome study will retard research on new agents?

Dr. Vogel: No, I think it is a step forward. I believe we have been misled by many of the intermediate endpoints -- whether intima/media thickness or endothelial function or whatever has suggested benefit. But many things are going on for all of these treatments. Until we actually look at hard endpoints, we will not know their effects in the real world.

Dr. Black: I agree completely. Thanks very much.

References

1. Vogel RA, Corretti MC, Plotnick GD. Effect of a single high-fat meal on endothelial function in healthy subjects. Am J Cardiol. 1997;79:350-354. Abstract

2. Vogel RA. Eating, vascular biology, and atherosclerosis: a lot to chew on. Eur Heart J. 2006;27:13-14. Abstract

3. Estruch R, Ros E, Salas-Salvadó J, et al; PREDIMED Study Investigators. Primary prevention of cardiovascular disease with a Mediterranean diet. N Engl J Med. 2013;368:1279-1290. http://www.nejm.org/doi/full/10.1056/NEJMoa1200303 Accessed March 6, 2013.

4. Vogel RA, Corretti MC, Plotnick GD. The postprandial effect of components of the Mediterranean diet on endothelial function. J Am Coll Cardiol. 2000;36:1455-1460. Abstract

5. Miller M, Beach V, Sorkin JD, et al. Comparative effects of three popular diets on lipids, endothelial function, and C-reactive protein during weight maintenance. J Am Diet Assoc. 2009;109:713-717. Abstract

Cite this article: Et Tu, Olive Oil? Fats and Endothelial Function. *Medscape*. May 10, 2013.