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Could Grapes Replace Blood Pressure Medication?

USAGE OF GRAPES IN EFFECTIVE CONTROL OF BLOOD PRESSURE AND HEART DISEASES

Will a handful of grapes replace your blood pressure medication in the future?

You are listening to ReachMD, The Channel for Medical Professionals. Welcome to our series Focus on Future Medicine. I am your host, Dr. Matthew Sorrentino from the University of Chicago and with me today is Dr. Steven F. Bolling. Dr. Bolling is the Professor of Cardiac Surgery at the University of Michigan, Ann Arbor, Michigan. He is also the head of the Complimentary and Alternative Medicine Research Center and the Cardioprotection Research Laboratory at Ann Arbor, Michigan.

DR. MATTHEW SORRENTINO:

Dr. Bolling, welcome to the show.

DR. STEVEN F. BOLLING:

Matt, thank you very much for having me here.

DR. MATTHEW SORRENTINO:

I thought I'd first start asking just a general question, is diet important in trying to control blood pressure in our patients?

DR. STEVEN F. BOLLING:

Well, I think it's very important. I mean, your mother told you to eat your fruits and vegetables and I think what she said was true and I think in terms of controlling our blood pressure, it's very true.

DR. MATTHEW SORRENTINO:

Now, I know that you and your group have been studying a number of different things and I was intrigued by your recent paper in the Journal of Gerontology. It was called chronic intake of a phytochemical enriched diet reduces cardiac fibrosis and diastolic dysfunction caused by prolonged salt sensitive hypertension. It was kind of a fancy title saying that we should eat our grapes. Why study grapes?

DR. STEVEN F. BOLLING:

Well, that is a mouthful of a title, but the answer is we should eat our grapes. Why do we study grapes, because there are some very interesting compounds in the grapes, probably in the grape skins perhaps that make the grapes dark? These chemicals are phytochemicals, if you will, really gives some protective edge against hypertension and heart failure.

DR. MATTHEW SORRENTINO:

Now, tell us a little bit about how you performed your studies so that we can determine how the grapes worked. I understand this was an animal model where these animals all developed hypertension?

DR. STEVEN F. BOLLING:

It's a very interesting animal model. The animal themselves are genetically preprogrammed when they are given a specific type of diet, a high salt, somewhat high fat diet, almost like an American fast food diet, if you will. It then developed hypertension and they go on to develop heart failure and they die prematurely from their heart failure. It's almost as if these animals are Americans and in this model when they are given this diet, you can then modify their diet with different elements in their diet and see the impact upon their development of high blood pressure and heart failure, even in the impact upon their death.

DR. MATTHEW SORRENTINO:

So how did you perform your study, what type of therapy did you give these animals? I can't believe you just gave them grapes, you must have had some sort of scientific way to study some extract from the grapes.

DR. STEVEN F. BOLLING:

Well, we did. We looked at whole table grape powder which we know has a very specific amount of the elements of the phytochemicals that we were studying and we divided the animals really into 5 groups. Two of the groups got a very high salt diet; a diet that we know will induce this trigger to hypertension and heart failure. Two of the groups got a low salt diet. One of them also got grapes. So each one of the high salt and low salt got part of the grape powder, and then a fifth group got the high salt diet in a very standard anti-high blood pressure medicine that we all use as doctors today.

DR. MATTHEW SORRENTINO:

So two of the groups got the grape extract and one of the groups didn't get the extract, but also had medication to lower their blood pressure. Was the amount of salt that these animals take, would that be equivalent to a typical American diet of 3200 mg or 3800 mg of salt or is this even more excessive than Americans would have?

DR. STEVEN F. BOLLING:

No, this is somewhat equivalent to the amount of salt in a regular American diet.

DR. MATTHEW SORRENTINO:

And then in terms of the amount of grapes, if I was going to reproduce this experiment in my own life, how many bunches of grapes would I have to eat to reproduce the amount that you gave the animals?

DR. STEVEN F. BOLLING:

Oh, of course, that's an interesting question. It's a little hard to make a guess from a small animal to about a human, but it's not probably going to be an outrageous amount, perhaps a cup or a cup and a half of grapes.

DR. MATTHEW SORRENTINO:

So it still is what would be a typical diet for someone who wanted to have a lot of fruits and vegetables in the diet.

DR. STEVEN F. BOLLING:

Yes, it's a typical diet for someone who likes fruits and vegetables and it's quite doable, if you will.

DR. MATTHEW SORRENTINO:

So, let's talk about what happened to these animals. I presume the ones that had high salt all got hypertension and then developed heart failure, what happened when you added the grape extract to that group of animals?

DR. STEVEN F. BOLLING:

Well the animals that did have the high salt diet with no other therapy went on to trigger the hypertension and have heart failure and die as they are sort of genetically predetermined to do. When we added the grape powder, interestingly they had far less high blood pressure. They also had when we did echocardiograms on them, their cardiac function was preserved, and in terms of their systemic inflammatory response, all the mediators of the inflammation which we know are bad in the situation were lowered with the addition of grape powder to their diet.

DR. MATTHEW SORRENTINO:

So in your trial you also had a group that you treated with an antihypertensive medication, I believe, you used hydralazine in this group

of animals; I guess, we won't call them patients yet, but did that group of animals also had some protection from the hydralazine or was there something unique about the grapes and not just the lowering of blood pressure.

DR. STEVEN F. BOLLING:

What was interesting, in the hydralazine group we got very equivalent lowering of blood pressure as in the grape group; however, we saw none of the protective effect. We saw no changes in cardiac fibrosis or a diastolic dysfunction that we saw on grape groups, so it was not just an effect of the grape group lowering their blood pressure, it was something well beyond that.

DR. MATTHEW SORRENTINO:

So something independent of blood pressure lowering seems to be working here.

DR. STEVEN F. BOLLING:

Absolutely. With the addition of the hydralazine group, we were able to prove that this is not just a blood pressure mechanism.

DR. MATTHEW SORRENTINO:

Now you also had two groups that you did not give a high salt diet to and one of those groups just got the low salt diet and one got the low salt with the grape extract, did you notice any difference in that group with the addition of the grape extract?

DR. STEVEN F. BOLLING:

Well, again it was very interesting. The low salt alone group did not get the trigger of hypertension and heart failure and a cascade downhill. The group with low salt and the addition of the grape, however, when we looked at markers inside those hearts, they were also improved; there was less inflammation, there was less TNF, there was less IL-6. The grapes clearly had the same biochemical effect inside the heart of these animals even though they did not have the trigger to go on to hypertension.

If you are just joining us, you are listening to ReachMD, The Channel for Medical Professionals. I am Dr. Matthew Sorrentino and I am speaking with Dr. Stephen Bolling who is the Professor of Cardiac Surgery and the head of the Complimentary and Alternative Medicine Research Center in Ann Arbor, Michigan.

We've been talking about his studies of using grape extract in his animal mode for hypertension.

DR. MATTHEW SORRENTINO:

I wonder if we can now extrapolate this to humans, you used grapes and you mentioned that there maybe something in the skin of grapes, would it be the type of grape, do we need to have red grapes versus white grapes or what seems to be the benefit that we are

getting?

DR. STEVEN F. BOLLING:

Well, the benefit I think probably is from a number of polyphenols that are in the grapes themselves. When we measured intracardiac glutathione levels or natural antioxidants that are in the cells, they were clearly elevated in the cells that have been in animals that had taken the grape and there a number of very interesting compounds, sort of roughly grouped into one group called anthocyanins; cyan, you know the Latin root word, it means blue, and that's what gives dark tart fruit their coloring; purple grapes, tart cherries, and so on like that, and in another group of chemicals, flavonoids which were also very beneficial and this rough grouping of what we are, the important polyphenols occur in this type of fruit.

DR. MATTHEW SORRENTINO:

Now I know that these polyphenols are in a number of different fruits. Certainly the berries are one of them. There were some recent studies looking at chocolate which I guess has some of these. Do you think it doesn't matter what we have, but it has to be certain of these flavonoids or other polyphenols that are the magic bullet in the different nutrients.

DR. STEVEN F. BOLLING:

Well, I think there is probably no magic bullet. I think nature has had a long, long time to balance the amount of anthocyanins and polyphenols and flavonoids in a blueberry or a tart cherry, or a grape. So I am not sure, although you know in medicine and science, we always want to look for that one thing that is the magic bullet. I am not sure that this really is the magic bullet and it's probably a combination of all these molecules working together.

DR. MATTHEW SORRENTINO:

So we won't just be able to define one molecule like resveratrol or something that is going to be a new medication. You have to eat the whole berry if you are going to get the benefit?

DR. STEVEN F. BOLLING:

Well, we don't know the answer for that and I am sure big pharma would like to see one particular thing that they can put in a pill, but a grape is actually pretty easy to take.

DR. MATTHEW SORRENTINO:

Now what about wine, I know there has been a lot of interest in looking at wine and some people way, oh it's the grape, that's what gives you the benefit and others have said it's the alcohol that gives the benefit, is there any thoughts you have from the literature you've reviewed that suggests what is the active ingredient when we have wine?

DR. STEVEN F. BOLLING:

Well I think again it's a combination. Clearly there is an effect of alcohol in low amounts, of course if we over indulge that's not a good thing. I think beyond just the effect of the alcohol, there are in those grapes the same elements of anthocyanins and flavonoids and resveratrol that we see in grapes, we see in the byproduct of grapes which is wine. So I think again there is a combination of good elements in that we can benefit from and are heart healthy for it.

DR. MATTHEW SORRENTINO:

Current recommendations for lifestyle modification with hypertension include a diet like the DASH diet. With your research, should we be modifying what we tell our patients or is a diet like the DASH diet still an adequate diet to try to lower blood pressure?

DR. STEVEN F. BOLLING:

Well, I think the DASH diet, we should all follow the DASH diet and I think it's an excellent beginning, but we may need researchers starting to formulate this concept, but now we are calling not just a heart smart diet, but a tart heart smart diet, if you will. Looking at those proved that had these elements of anthocyanins, flavonoids, polyphenols, resveratrol in them. So this new concept of perhaps a tart heart smart diet is beginning to be promoted.

DR. MATTHEW SORRENTINO:

So the current recommendation I believe are 5-9 fruit and vegetable helpings a day which is the American heart and the DASH type approach, would you then modify it to say use only these particular fruits and vegetables, and if so, which ones would you put highest on your list?

DR. STEVEN F. BOLLING:

Well, I am not sure we are ready to say exactly which ones, but I think those fruits that are high in these such as grapes and tart cherries and blue berries and other things like that should be considered very strongly.

DR. MATTHEW SORRENTINO:

Now, your particular animal model used a very high salt diet, so with a salt sensitive type animal model, would you expect that we would get the same benefit if patients went to a very low salt diet or would the benefit be less noticeable when salt is taken out of the picture?

DR. STEVEN F. BOLLING:

Well, it's interesting even in the animals in our study that had a low salt diet, we still saw the beneficial effects on inflammatory markers, so I would say it's probably going to be beneficial for everyone even on low-salt diet, even those patients without hypertension, I think this is probably a good recommendation for almost anyone.

DR. MATTHEW SORRENTINO:

I want to thank Dr. Steven Bolling who has been our guest. I am Dr. Matthew Sorrentino. You have been listening to ReachMD, The Channel for Medical Professionals.

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