Webcast

Identifying and Addressing Elevated Sodium Intake to Decrease Cardiovascular Risk: Expert Perspectives and Discussions

Part 3: Practical Strategies to Address the Impact of Increased Sodium Consumption on CVD Risk

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Practical Strategies to Address the Impact of Increased Sodium Consumption on CVD Risk

VIREND K. SOMERS, MD, PHD: That was excellent, Gregg. It gave us lots of practical, important information, and certainly the Alka Seltzer information you presented was particularly interesting.

Now I'm going to go on to Dr. Deborah Clegg, who's going to give us an excellent talk on practical strategies to address the impact of increased sodium consumption on cardiovascular risk. How do we take all the information you heard earlier from myself and Gregg, and how do we put that into practice in terms of improving cardiovascular and vascular health? Deborah?

DEBORAH J. CLEGG, PHD, RD: Thank you so much. These were two outstanding presentations, so it's a real pleasure for me to be able to follow these individuals up. Let me just begin by talking to you a little bit about the overview of my presentation. First, I'm going to talk a little bit about the challenges of addressing overall eating behaviors.

Changing eating behaviors is incredibly difficult, so we'll talk a little bit about some practical applications of ways that we might be able to change our eating behaviors, especially with respect to reducing our sodium intake. I'll also provide you some suggestions and advice as to how to reduce the dietary intake of salt. We'll also talk about reducing the impact of commonly-used medications with high-sodium content. Again, you just heard two excellent presentations highlighting the fact that many of the drugs that we're currently taking are incredibly high in sodium. We'll also talk a little bit about the importance of considering total sodium intake when we're weighing treatment options and the impact of non-dietary sources of sodium. Again, we talked at little bit about the different types of medications, but we'll also talk a little bit about some other types of ways that we're exposed to sodium.

Not to belabor the point, but our two previous speakers just really highlighted the fact that there is a strong correlation between mortality and high sodium intake. You just heard many different trials that were able to demonstrate this. This is another graph that demonstrates again that those individuals who are consuming a higher diet that's high in sodium, actually, that's associated with a higher overall mortality and death.

Again, we just heard a little about the fact that sodium and salt are different. Sodium is a mineral in our body that's required in order to help control blood pressure and other functions of our body. However, when we talk about salt, we're actually referring to the substance that you add to your dishes, which a source of sodium. Our bodies only need very, very small amounts of sodium. As you've already heard most people are eating too much sodium, but they're probably not

aware of it. One teaspoon of salt is equal to 2300 mg of sodium. You just heard that the recommendation for the amount of sodium that we take in our diet for one day is 2300 mg. That's equivalent to just consuming 1 teaspoon of salt.

What are the dietary recommendations for sodium? These recommendations have been made by many, many different types of organizations. We list here the American Heart Association, also the American College of Cardiology, also the Department of Human Health and Human Services, The National Academy of Sciences. All of these different types of boards recommend diets that are incredibly lower in sodium. The reason that we recommend diets that are lower in sodium is that we know that the consequences that are associated with excess sodium intake include fluid retention, heart failure, hypertension, stroke, cardiomyopathy, as well as kidney disease.

What are the challenges associated with eating a diet that is low in sodium? What I want to do is Dr. Pressman actually started with a historical perspective. I'm going to take you back even further. This is my historical perspective. That is that there is a mismatch between the modern diet that we're consuming and the diet that was introduced over 10,000 years ago and the nutritional requirements encoded into the human genome, which developed again several million years prior to the Stone Age.

Our prehistoric man ate a diet that was incredibly high in potassium. Our prehistoric man actually consumed a diet that had about 15,000 mg of potassium per day. What's happened though since the evolution of time is that we've transitioned from incredibly high-potassium diet that was also very, very low in sodium, to a diet that's incredibly low in potassium--actually potassium is listed as a nutrient of concern because we don't consume enough of it--to a diet that's incredibly high in sodium.

You might be wondering why is it all of a sudden we're belaboring the point that sodium is so incredibly bad. How is that we've evolved all these years? Well, unfortunately what's happened is that our dietary food intake, the processing of our food, has increased exponentially with the amount of sodium that it has in it. So we've switched from a diet that was incredibly healthy like the DASH diet that included fresh fruits and vegetables and was high in potassium and low in sodium to a diet that's filled with processed foods that's very, very low in potassium and extremely high in sodium.

So this is just again to elucidate that point. The modern diet is the diet that is incredibly high in sodium, very, very low in potassium. It's also low in calcium, as well as magnesium, again, because we're not eating fresh fruits and vegetables. The natural diet was a diet that completely reversed this, very, very low in sodium, extremely high in potassium, higher in calcium, as well as higher in magnesium. So it's this unfortunate dietary evolution that's actually caused us to have this

problem with sodium.

Again, why is this important? I like to think of potassium and sodium as sort of the ying and the yang. A low potassium intake actually reduces sodium excretion. Let's think about that. If you're eating a diet that's relatively low in potassium, you're actually excreting less sodium, the very product that we've just heard that we need to excrete more of. In reverse, a high-potassium diet actually increases sodium excretion. There are these potassium-sensing cells that are located in the kidney that actually are able to sense whether there's low or high sodium or potassium and regulate the overall level of sodium balance.

The other thing that I find interesting--so I was a dietitian for many years prior to becoming a researcher. But when I was counseling people about sodium, I always talked to them about this. That is that sodium intake is actually a learned response. There are sodium sensors in our tongue where we actually can sense sodium. There has actually been a thought in the nutrition world that perhaps if our baby formulas weren't so incredibly high in salt, we wouldn't actually learn to like salt the way that we actually have learned to like it now.

I turn this into a positive though. It is absolutely one of the unusual marvelous things, that you can actually unlearn your preference for salt. If you go to a low-sodium diet from one that's relatively high, first the foods will taste relatively bland. But if you give it time, over time you will actually find that after you've removed the salt from your food, the food actually has a fabulous flavor. You can unlearn your desire to have salt. Many of us instead of even tasting the food, we just start putting the salt shaker on top of our food. But we can unlearn that. We can unlearn that desire to do that just by unlearning the fact that sodium is this pleasurable flavor. Again, if you step away from the salt shaker for some period of time, you will then find that you prefer foods that are very much lower in sodium and you actually won't reach for that salt shaker.

This is just another illustration about the fact or the association between salt and health. Again, we just heard some fabulous presentations that as you increase your salt intake, it raises your blood pressure, it causes blood vessel damage, and it also interferes with your hormonal pathway. It induces an inflammatory response and it actually even changes our gut microbiota. This then leads to end-organ damage such as the cardiovascular damage, brain damage related to stroke and the like, kidney damage, as well as other organs and specifically changes again in that gut microbiota.

How about some suggestions and advice for actually reducing dietary sodium? Well, the first thing is because the Food and Drug Administration and many other organizations recognized some time ago that we needed to pay more attention to our sodium in our diet, they actually began labeling our foods. This is just a picture of what a food label actually looks like. It will tell you the amount of sodium that's

actually located within that product.

I want you to become very, very familiar with this. You must look at the serving size per that item. For example, in this food label, it's indicating that this product you can actually have two servings per container. Beware. There are products where it might be two gum drops is equal to 15 mg of sodium and you would think that if you ate the entire bag, that's only 15 mg of sodium, where in actuality it was only two gum drops or two Milk Duds or whatever it happens to be. Incredibly important; you must look at the serving size in order to get a true reading of actually how much sodium you're taking from that specific product.

As alluded to earlier, it's the processing of our foods where we're actually taking in a large amount of sodium. Now I talked to you a little bit about the fact that you can unlearn the desire to shake on the salt at your table. But notice actually the salt that you're shaking on to your table is not really what our biggest concern is. A large amount of our sodium is indeed coming from the processed foods. Let's take a little bit more time and look at that more carefully.

These are the sources of sodium in our diet. For example, they come from cured meats. They come from pickled foods, canned vegetables, frozen peas, and lima beans. You wonder why I am highlighting frozen peas and lima beans. Well, one of the ways that they actually keep the pea in the pea shape and the lima bean in the lima bean shape is they actually coat both of those in a layer of sodium. So then instead of when you thaw your vegetables, your peas and lima beans don't turn into a mush. So there's actually extra sodium located on a frozen pea or a lima bean just so that it has that shape.

We also have salted snack foods, soy and other sauces, baking soda, as well as monosodium glutamate. If you happen to go out to a fast food Chinese restaurant, they tend to utilize a large amount of monosodium glutamate, so you're getting a large amount of sodium by eating that processed Chinese food. Also other seasonings have a high amount of sodium.

I really liked the initial case by Dr. Kempner, which was reported in that American Journal of Medicine article in 1948. He talked specifically about the rice diet. What I found interesting about that is that probably in 1948 they didn't have instant rice. If now Dr. Kempner put those patients on a rice diet and those individuals actually were consuming instant rice, that instant rice would have far more sodium than actually the rice that Dr. Kempner was reporting in that paper. This is just to say that all of our processing of our foods to make them faster, easier to cook, whatever it happens to be, that processing per sé is actually significantly increasing the amount of sodium in our diets.

This is another example. You could actually have 1 ounce of hard cheese, and there are some pictures of some hard cheese. That would only contain about 176 mg of sodium. But unfortunately, as you just saw, our sandwiches probably have

significantly higher amounts of sodium in them because instead of having the hard cheese on our sandwich, we actually take a slice of processed cheese. Look at the difference in the amount of sodium. The 1 ounce of hard cheese had 176 mg of sodium, where that 1 ounce of processed cheese has 407 mg of sodium. So again, you could just switch by eating hard cheese on your sandwich as opposed to a slice of cheese.

What do you do? Say you want to avoid the sodium in your food. You stepped away from the salt shaker. Maybe you're noticing that your foods are not tasting quite as tasty. So why is sodium added to our foods? Well, it's actually utilized to enhance the flavor of our foods. It adds a salty taste to our foods, it boosts the flavor balance and can enhance the sweetness or the sugary flavor of some of he items, it masks the bitterness, and it also makes some types of the processed foods much more palatable.

Sodium is also added to our foods to preserve the freshness. It increases the shelf life, so a lot of our breads--I'll talk about this more in a moment--have a significant amount of sodium in them just so that you can enhance the shelf life of that bread so that you don't have to buy it every day. Sodium is also added to our foods to improve the texture, as well as the appearance. It makes the product seem thicker or fuller. It enhances the color or the hue. It actually helps retain the moisture of many types of meat products. It stabilizes the texture. It allows the bread and the cheese not to stick together. It prevents unwanted chemical changes to other nutrients and ingredients in baked items.

So this is just a yummy picture of all the different types of processed foods that you might be consuming: salami, different types of ham products, all of those different types of snack products. This is where your sodium is coming from. So much of your diet and the sodium in your diet is specifically found in all of these different products that we tend to consume on a high level.

The dietary recommendations for a low-sodium diet. A sodium-restricted diet should be treated as you would any other type of prescription medicine. When your doctor or you recommend a low-sodium diet, we as the patients need to be very, very cognizant about the fact that this is important for our health. We really need to pay attention to it and we need to treat the diet that we're consuming just like any other prescription medicine. A low-sodium diet is typically thought to be about 2000 mg per day and 1 teaspoon of salt, again, contains between 2000 and 2300 mg of sodium.

Here's a true or false question for you just to think about. The best way to eat less sodium is to stop using the salt shaker. As we've alluded to not only in the previous presentation, but also mine, it is false. The best way to avoid sodium is actually to avoid those processed foods. This again is just another pie chart to illustrate that point. The foods that we're getting from our restaurants, from all of

that processing, that's where so much of our sodium is actually coming from.

Again, what are the health benefits of a low-sodium diet? It actually can improve overall cognitive function. It can reduce overall inflammation. It can also change the gut microbiota. There are so many different health benefits associated with consuming a low-sodium diet.

Here are the suggestions or advice for reducing the dietary sodium. Acids that you actually could add to your dishes go from making the dishes very dull in flavor to actually exciting and more flavorful. Before you reach for the salt, try adding an acid. Like salt, acids can actually increase the flavor. It can also bring about more flavors than just the sale per sé. Different types of acids that can be used in cooking include the vinegars, tomatoes, and wine. Other acids include juices of citrus fruits like lemons, limes, and oranges. So oftentimes, you can take a lovely piece of white fish, squirt a lemon or a lime over the top of that fish, and it needs no more seasoning than that because it really brings out the flavor of that fish in a very, very healthy, tasty way.

If using the acid to increase the flavor in a dish, add a splash of vinegar, wine, or some tomatoes at the beginning of the cooking and then add a splash of that citrus at the end of the cooking and it will really enhance the flavor of the product that you're actually cooking. These are general rules, but you might want to experiment in your own kitchen to find out which types of flavors and which types of ways that you can cook your food that really reduce the overall sodium.

The key here is that you're actually going back and you're making products from scratch. You're not buying that instant rice. You're actually cooking rice the old fashioned way, utilizing just regular grained rice and cooking it in the slow fashion. You have to actually go back and start cooking yourself, rather than buying preprepared products, which is where all of the sodium is located.

So which do you think? Do you think that the turkey club or a turkey cheddar cheese sandwich is actually higher in sodium? Well, the steak and cheddar cheese sandwich has about 1900 mg of sodium. Again, we already talked about that sandwich that you're probably eating at lunch time that is so incredibly high in sodium, that turkey club has even more sodium. It has about 2400 mg of sodium. Why would the turkey club have so much more sodium than the steak and cheddar? Well, one of the reasons is that you actually have three slices of bread in those club sandwiches and there's a healthy slice of bacon. So we're going to talk a little bit about the bread.

What are other ideas or advice for reducing dietary sodium? Well, one might be actually skipping that bread basket. Bread, again, so that it's shelf stable so that you can have it around for a long period of time, unfortunately, we've added a lot of sodium in baking of those breads so that they can withstand shelf life. So our breads have a high amount of sodium. As I alluded to, that turkey club probably

has those three slices of bread. That extra slice of bread is adding a significant amount of sodium. Unfortunately, the breads don't even taste salty, so we don't even realize how much sodium we're actually getting from those bread products.

We also should try to avoid menu items that have a lot of cheese. Again, these include the processed meats such as bacon, ham, and salami. We should also avoid foods that are pickled or smoked. Again, I had that picture of the ham, the deli-baked hams that are smoked. All of those smokings or the extra rubs, those are all extra sodium that actually are placed on those products to enhance the flavor.

What about other forms of sodium? So people have now started switching from the regular table salt and are now thinking: so perhaps what I can do is I can eat sea salt or one of the current crazes is actually what about Himalayan salt? Some people think that the pink Himalayan salt is lower in sodium than regular table salt. However, both types of salt contain about 98% sodium chloride. As the pink salt often has larger crystals than table salt, you might actually utilize a little bit less of the larger crystal. In theory, you might get a little bit less sodium, but really I wouldn't not recommend this as a sodium replacement or a way of significantly reducing your sodium intake by switching to Himalayan salt.

We alluded a little bit to the fact that increasing your dietary consumption of salt really has an impact on sleep. So this is just a schematic that I'm using where it indicates again that if you have a high dietary intake of salt, this leads to sodium and fluid retention. It causes increase in parapharyngeal edema, increased upper airway resistance, and this leads to worsening obstructive sleep apnea.

Again, we alluded to the fact that there are these medications that are incredibly high in sodium. They're actually utilized often for either narcolepsy or for sleep apnea. Luckily for us, there is a lower-sodium version that actually might be much more recommended for our individuals who already have a high salt intake. Perhaps then we can help regulate their sleep with a lower-sodium version of this very medication.

Potential barriers for nutritional therapy. Patients and physicians are often not well versed about food sources and content of sodium. I hope that I've been able to highlight and enlighten you a little bit about different sources of sodium. Unfortunately, there are low reimbursements rates and billing implementation and limited referral for nutrition therapy, so many of our patients don't even know where the sodium is actually coming from within their diet because they don't have the opportunity to see a dietitian.

Patient time limitations and access to care also limited. Again, they're not getting the good nutritional advice that we're trying to provide you today. Also, diverse cultural and ethnic diets and lifestyle pose a challenge. There are diets that are specific to different ethnicities that are much, much higher in sodium, so we might have to get extra creative in coming up with alternatives in order to be able to

facilitate reductions in overall sodium. There are oftentimes communication challenges, as well as patient compliance and adherence to dietary adjustments.

With that, I'll turn it back over to my colleagues, and thank you very much.

DR. SOMERS: Thank you very much. That was great. Some of the things I got out of that was, one, you pointed out that increasing your potassium intake actually helps you excrete sodium, which is very interesting and I think very important.

Also, the point you made about processed foods being so important in terms of an effective strategy to reduce salt intake, we all think of it as salt shakers, as you said, and we say I'm not using the salt shaker anymore, but nothing's happening. Well, that's the reason there, that you pointed out.

Then the fact that we can use acid substances, vinegar, is a great point, potassium salts as substitutes in terms of, again, effective ways to lower salt consumption.

Last, the bread. I had no idea that bread had so much sodium.

DR. CLEGG: Exactly. In medical school, oftentimes they don't teach you all about the nutritional nuances. It is incredible how much bread is. So when you put someone on a low-sodium diet, we oftentimes in order to get them as low as they need to go, we actually refer them to eating a low-sodium bread product, which isn't necessarily tasty. If they went back and made their homemade bread, they could have a significantly lower amount of sodium, but it's the processing of the bread and the shelf stabilizers that actually enhance that sodium content.

DR. SOMERS: That's really important to know. Thank you very much. It was great. Gregg and you did a super job in building on some of the initial data I showed in terms of why salt is bad, how it's bad, and most importantly, what we can do about it. Thank you.