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With a Grain of Salt: Can We Make a Difference?

Salt is a plentiful and inexpensive preservative, and its use is noted in historical texts dating back many centuries.[1] Although our bodies require a modest amount of salt (in the form of NaCl) to function normally, it seems too easy in modern times to get much more that is needed, with resulting health problems such as hypertension and other cardiovascular complications. Within the definition of "salt" in the Merriam-Webster online dictionary, one finds that skepticism might be described as "with a grain of salt," leading one to wonder about the advice given to patients at times.[2]

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A recent experience in a hypertension clinic pointed out the challenges confronted by patients who try to follow the advice they have been given. A teenage boy who has been followed for a couple years mentioned that he was having headaches. He is an average-sized teenager, an athlete and a good student with a family history of hypertension. He monitors his blood pressure at home and brings in a log of recordings at visits. He takes a small dose of one medication, which controls his blood pressure. As we discussed his headaches, he finally volunteered: "Doc, they tend to happen at the end of the day, and I think it's because I get hungry." Asking further about his breakfast and lunch habits, he also volunteered that he skips those meals, because "the food they serve isn't on the diet I'm supposed to follow." Who might be more skeptical, patient or doctor?

In this volume of *The Journal*, Rich et al report their analysis of data from more than 16 000 children and adolescents collected in the US National Health and Nutrition Examination Surveys (NHANES) from 2003 to 2016. The authors analyzed the sodium intake of these individuals.[3]

Despite widespread efforts at the national level to reduce the intake of sodium, whether the recommendations from the US Department of Agriculture (USDA) have had any impact is not clear. Rich et al provide insight into the sodium consumption of the pediatric population. The USDA has recommended reduced sodium consumption for a quarter of a century, and age-specific guidelines have been in effect for a decade. Yet, the findings of this analysis tell a different story. The authors reviewed the intake of a large cohort of children and adolescents aged 4-17 years, split almost evenly between males and females, using NHANES surveys for 2003-2016. Along with looking at the entire group, they also examined subsets of the group by age, sex, race, and ethnicity.

NHANES	National Health and Nutrition Examination Survey
USDA	US Department of Agriculture

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The median sodium intake across the study period was 2840 mg/day, with a modest reduction from 2912 mg/day in 2003-2004 to 2787 mg/day in 2015-2016. Increasing age was associated with increased intake, and males were more likely to have increased sodium intake. There were also differences when race and ethnicity were taken into account. Across the study period, there was no change in the rate of adherence to USDA recommendations, and at the subgroup level, no group adhered to the 2010 pediatric guidelines by >30%.

Although this study has some pitfalls, it nonetheless points out some key issues that merit consideration. One pitfall is that large observational and cross-sectional surveys like this cannot establish causation, and yet it is clear that longstanding guidelines have had little impact on salt consumption. The link between sodium overconsumption and adverse disease has been well established in adults but not yet in children and adolescents. Another obvious pitfall is that NHANES surveys are not designed to look at clinical outcomes. Although a direct link has not yet been established in children, this could be a call for a potential study, and because these types of issues can be hereditary, one could imagine the potential value for family-based interventions.

The authors discuss the national school lunch program as well. There was hope that with the enactment of the Healthy, Hunger-Free Kids Act in 2010 that over a 12-year timeline intended to lead to an approximately 50% reduction in sodium added to school lunches by 2022. Recently, however, efforts have been made in Congress to reduce the enforcement of these nutritional standards.

Studies like this one often raise more questions than answers, and yet they also prompt reflection and provide a call to action: reflection on what we can do to improve not only the quality of the diet of children and adolescents, but also the outcome of this diet on their health in the future, and a call to action to try to understand the gaps that exist and how to improve them.

The interplay between medicine and public health comes into focus. The language of public health also informs us to consider the social determinants of health as well. Diet is one of those determinants, and access to fresh fruits and vegetables and fewer processed foods must be considered relative to a family's ability to obtain them and to pay for them. Providing advice to a child with hypertension in the context of a family that may also be burdened by hypertension and its complications can be challenging when diet is part of the treatment plan. Telling a patient to "eat healthier" rings hollow if that patient's family cannot get to a full-service grocery store or a farmer's market, or if the family cannot afford healthy foods. The patient mentioned earlier who, in an effort to follow the doctor's advice and control his blood pressure, was suffering because the food that he had been offered at school was not consistent with the advice he had been given, should not have to make such a choice.

As pediatricians and other providers of healthcare to children and adolescents, it is important to remember that prevention is a key factor in health, and sometimes the simple advice like eating less salt is easier said than done. It may even lead one to wonder whether patients take that advice with a grain of salt, given the ready access to salt in the food they consume.

It is interesting to consider that the most recent clinical practice guidelines regarding hypertension in children and adolescents were published in 2017, and in those guidelines, Key Action Statement 19 discusses treatment, including lifestyle adjustments that include sodium reduction.[4] Long before these latest guidelines were published, the Fourth Report on Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents, published in 2004, included recommendations for limiting sodium intake.[5] Although there is medical evidence to support this advice, and public health evidence as well, patients are caught in the middle.

As we review these data, we also need to remember to advocate for our patients and their families to promote a better lifestyle, improved outcomes and less cost burden to the healthcare system. With better healthcare, we may actually even be able to afford better medical care. ■

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