The salt debate – more salacious than salubrious

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Over the last two decades, the understanding of salt reduction as a means to reduce blood pressure has evolved from a recommendation for voluntary dietary restriction for individuals at risk to a point where the entire population is in the process of having its food choices narrowed to products engineered for reduced sodium intake in accordance with the 2010 Dietary Guidelines.

Despite the broad perception that our sodium intakes have risen in the past number of years, the recent study by Bernstein and Willett[1] indicates that our sodium intake has been stable at approximately 3,500 milligrams sodium per day (9.1 g salt) for the last 50 years. This stable figure appears to repudiate any link between salt intakes and the rising rates of obesity and hypertension.

There is very little historical evidence of salt consumption, but it appears that we may currently be consuming a far lower level than ever before in recent recorded history[2]. Military records spanning the period from the war of 1812[3,4] to the end of WWII[5,6] indicate that rations for both soldiers and interred prisoners of war varied between 18 - 20 g of salt per day - about double the amount we currently consume in the US.

The large drop in salt consumption occurred immediately after WWII, when refrigeration replaced salt as the primary means of food preservation. Before that time, most of our famous traditional foods such as cheeses, beef, pork, fish and vegetables were preserved in salt or with salt brine. Thus, without any government policy making or sensationalist prodding on the part of consumer advocates, the simple introduction of new technology influenced our choices towards lower salt foods. After the large drop in salt consumption that took place in the 1950s, our salt consumption has remained stable.

Dietary salt reduction as the primary lifestyle strategy to reduce blood pressure has been aggressively promoted by activist groups such as the Center for Science in the Public Interest (CSPI) and World of Action on Salt and Health (WASH), as well as the CDC, WHO, the IOM and more recently, the FDA. Even the White House has weighed in by placing pressure on many influential food industry stakeholders to reduce the salt content of their foods. Wal-Mart, one of the country's largest food retailers has publicly indicated that it will require their suppliers to dramatically reduce the salt content of their food products[7]. This type of pressure may effectively sidestep the normal regulatory process and the need to provide the scientific justification for such regulations.

With these initiatives actively underway, can we expect the population-wide consumption of salt to start approaching the 2010 Dietary Guidelines goal of 2,300 mg sodium/day or less? According to the available data, when this happens, Americans will be consuming considerably less salt than they ever have in recorded history and less than in any other country in the world[8,9].

As this sodium reduction strategy will be charting new territory, the entire population will, in effect, be placed in a dietary intervention trial to demonstrate the impact of low sodium intakes. Indeed, the IOM Committee that drafted the Strategies to Reduce Sodium Intake in the United States cautioned that at all stages of their stepwise sodium reduction strategy, efforts to analyze any unintended consequences should be carried out[10].

But what do we really know about the impact of salt reduction on human health and why are the available studies so inconsistent and controversial?

(This will be the bulk of the PowerPoint presentation, reviewing all the evidence 'for' and 'against' salt reduction as well as the dynamics and characters involved in the salt/health debate.)

As the primary lifestyle strategy to reduce blood pressure, dietary salt reduction differs significantly from other interventions, such as adopting a Mediterranean diet or increasing physical activity or reducing workplace stress, since the negative consequences of these latter strategies are known to be very limited. However, when salt reduction is selected as the primary lifestyle strategy to reduce blood pressure, as stated in Alderman et al (1991)[11] and repeated in the Dietary Recommended Intakes (DRIs)[12], renin and consequently aldosterone (R/A) levels begin to increase when sodium intakes fall below 2,800-3,000 mg per day (~7 – 8 g salt per day). It is now generally recognized that elevated renin/aldosterone levels are a significant risk factor for cardiovascular disease, just as blood pressure is.

While reducing salt intakes may reduce blood pressure for some individuals, it is likely to increase renin/aldosterone levels for everyone. As a blood pressure reduction strategy, unlike overall diet improvement, or stress reduction or increased physical activity, salt reduction trades off one cardiovascular risk factor (BP) for another (R/A) – in a sense it is like robbing Peter to pay Paul. This trade-off appears to account for the many studies that demonstrate salt reduction to reduce blood pressure for some individuals while increasing morbidity and mortality for many others. This trade-off in risk factors has never been accounted for in all the models projecting the benefits of salt reduction, and has seldom been mentioned in the arguments for population-wide salt reduction.

A number of recent publications have verified the negative consequences of salt reduction in the diet[13,14,15,16,17,18], therefore the unintended consequences of salt reduction may not be lightly brushed aside as being inconsequential or nonexistent. If, the science behind these peer-reviewed studies is sound, then we can expect the general population to respond in the same way as the experimental groups.

Considering the potential impact of this significant dietary adjustment, normal prudence should dictates that we must consider a large randomized controlled clinical trial to precede any population-wide intervention. That has not been the case and the current compulsion to reduce salt intake, actively supported by public health authorities, the administration and advocacy groups must be coupled to an analysis that will track the relationship of salt intakes (using 24 hr urinary sodium measures) with specific health outcomes and risk markers to ascertain the actual

impact of salt reduction. Subjecting an entire population to an untested dietary regime with known risks requires this analysis be instituted.

This will be the only way for us to learn if population-wide salt reduction is a benefit or a liability to public health. Consumers deserve no less.

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