Brief Report

The World Hypertension League: where now and where to in salt reduction

Norm R. C. Campbell[1], Daniel T. Lackland[2], Liu Lisheng[3], Xin-Hua Zhang[4], Peter M. Nilsson[5], Mark L. Niebylski[6]; the World Hypertension League Executive[2]

[1]Libin Cardiovascular Institute of Alberta, University of Calgary, 3280 Hospital Drive NW, Calgary Alberta, T2N 4Z6, Canada; [2]Department of Neurosciences, College of Medicine, Medical University of South Carolina, Charleston, USA; [3]Beijing Hypertension League Institute, Fu Wai Hospital, Beijing, China; [4]Beijing Hypertension League Institute, Beijing 100037, China; [5]Department of Clinical Sciences, Lund University, Skåne University Hospital, Malmö, Sweden; [6]World Hypertension League, 415 Bass Lane, Corvallis, Montana 59828, USA

Correspondence to: Norm R. C. Campbell, MD. Professor of Medicine, Physiology and Pharmacology and Community Health Sciences, University of Calgary, 3280 Hospital Drive NW, Calgary Alberta, T2N 4Z6, Canada. Email: ncampbel@ucalgary.ca.

Abstract: High dietary salt is a leading risk for death and disability largely by causing increased blood pressure. Other associated health risks include gastric and renal cell cancers, osteoporosis, renal stones, and increased disease activity in multiple sclerosis, headache, increased body fat and Meniere's disease. The World Hypertension League (WHL) has prioritized advocacy for salt reduction. WHL resources and actions include a non-governmental organization policy statement, dietary salt fact sheet, development of standardized nomenclature, call for quality research, collaboration in a weekly salt science update, development of a process to set recommended dietary salt research standards and regular literature reviews, development of adoptable power point slide sets to support WHL positions and resources, and critic of weak research studies on dietary salt. The WHL plans to continue to work with multiple governmental and non-governmental organizations to promote dietary salt reduction towards the World Health Organization (WHO) recommendations.

Keywords: Salt; sodium; public health; hypertension; blood pressure

Submitted Feb 28, 2015. Accepted for publication Mar 17, 2015.
doi: 10.3978/j.issn.2223-3652.2015.04.08
View this article at: http://dx.doi.org/10.3978/j.issn.2223-3652.2015.04.08

Introduction

Increased blood pressure is the leading risk for death and disability. According to the Global Burden of Disease (GBD) Study almost 1 in 5 deaths and 7% of disability can be attributed to sub optimum blood pressure (1). Also gastric and renal cell cancers, osteoporosis, asthma severity, renal stones, increased disease activity in multiple sclerosis, headache, increased body fat, Meniere's disease, and direct renal, vascular and cardiac damage have been associated with high dietary salt (2-7). An estimated 40% of the global population over age 25 has hypertension, which in turn is attributed to over 50% of heart disease and stroke, two major global non-communicable diseases (NCD) (8). The predominant global burden of NCD is in low to middle income countries that do not have adequate resources to counter the increasing numbers of people with NCD (8). In fact, the threat to global development and economies caused by increasing NCD resulted in the United Nations convening its second meeting on health (9). Of nine health targets selected by the United Nations to be achieved by 2025, one was to reduce uncontrolled hypertension by 25%, and one was to reduce dietary salt by 30% (9). Based on the large burden of disease, the World Health Organization (WHO) dedicated World Health Day in 2013 to hypertension (8).

High dietary salt is estimated to cause about one-third of hypertension or more than 300 million people to have hypertension (1,10). Diets that are comprised of fresh fruits, vegetables, meats, fish and poultry without added

salt generally have 0.25 to 2.5 gm salt (100 to 1,000 mg sodium)/day (11). Globally intake of salt now exceeds 5 gm (2,000 mg sodium)/day by age 5 in most of the world (12,13). Salt intake above 2.5 gm (1,000 mg sodium)/day is attributed to over 3 million deaths/year and intake above 5 gm (2,000 mg sodium)/day 1.65 million deaths/year according to the GBD Study (14) [Institute for Health Metrics and Evaluation (IHME). GBD Compare. Seattle, WA: IHME, University of Washington, 2013. Available online: http://vizhub.healthdata.org/gbd-compare, accessed Jan 11, 2015]. The WHO recommends adults consume less than 5 gm (2,000 mg sodium)/day with proportionally lower levels in children based on their lower caloric needs (15).

The World Hypertension League (WHL) is a coalition of national and regional hypertension organizations dedicated to the prevention and control of hypertension working also in official relations with the WHO and the International Society of Hypertension. The WHL developed and oversees World Hypertension Day each May 17th as a mechanism to draw attention to the highly preventable disease burden caused by increased blood pressure and also the critical need to reduce this burden. The WHL has currently prioritized two major programs, reducing dietary salt and increasing awareness of hypertension. This article outlines the activities of the WHL to advocate for reducing dietary salt. The various documents and resources referred to in this manuscript can be accessed at the WHL website www.whleague.org (16).

WHL salt reduction efforts

Dietary salt policy

Preventing and controlling hypertension is complex and requires a strategic approach (17). The WHL in advocating for strategic approaches to preventing and controlling hypertension has encouraged the incorporation of actions to reduce dietary salt (17). More specifically, the WHL with the International Society of Hypertension developed a policy statement to guide non-governmental organizations in advocacy for dietary salt reduction (18). The policy calls for specific governmental, industry as well as non-governmental actions to achieve the WHO targets for salt reduction and at a minimum to the United Nations target of a reduction in national consumption levels of 30% by 2025. A strong central role for governments to oversee a reduction in salt additives to processed foods is indicated to be the cornerstone of successful programs. Nevertheless, health care professionals and scientists play a critical advocacy role. A slide set about the policy statement on the WHL website is to assist clinicians and scientists advocate [World Hypertension League 2014. Available online http://www.whleague.org/index.php/j-stuff/resource-center, accessed Jan 12 2015]. To facilitate the uptake of the policy, the WHL has conducted a symposium on salt reduction at its regional meeting in Africa and at the International Society of Hypertension meeting. One outcome of the African regional meeting was an agreement to assess the feasibility of a salt reduction committee/coalition and to work with the WHO on dietary salt reduction.

Nomenclature

Salt, sodium, mg, gm, mmol, and meq: what does it all mean? In general, most of the world identifies dietary salt in gm/day while North America uses dietary sodium mg/day (5 gm salt is 2,000 mg sodium). To add to the confusion, some more recent investigators indicate sodium in gm, sometimes do not indicate if they are referring to salt or sodium and put different units (e.g., mmol) in the same manuscript without informing readers of how to interchange units (19). The WHL policy is to indicate salt gm (sodium mg)/day and we encourage other investigators to do likewise and for journals to adopt this standard. At a minimum, authors should use consistent units and indicate how to convert units to those generally used (salt gm and sodium mg). Further, different publications indicate the same level of salt intake as being high or low and in describing reductions in dietary salt indicate the same reduction as being large or modest. The WHL has developed recommended nomenclature for describing salt (sodium) intake based on diets of natural food without added salt and on current recommended intake of salt by the WHO (16). Recommendations for describing reductions in salt intake were based on the range of reductions in dietary salt from randomized controlled trials lasting four or more weeks. The WHL hopes that use of common terminology will help achieve a common understanding of the physiology and pathophysiology of dietary salt and of interventions to reduce dietary salt.

Fact sheets

Multiple groups and individuals using different and conflicting statistics and recommending differing interventions are confusing to policy makers and the

public. Consistent use of accurate up to date information is critical to advocacy efforts. However, it is often difficult to obtain up to date accurate information that has been endorsed by credible organizations on the impact of dietary salt on health and of hypertension on health. The WHL with the International Society of Hypertension therefore has undertaken to develop and annually update facts sheets on dietary salt and also on hypertension (20,21). A slide set on the WHL website also provides standardized information of the impact of high dietary salt on health [World Hypertension League 2014. Available online: http://www.whleague.org/index.php/j-stuff/resource-center, accessed Jan 12, 2015]. Although the facts sheets produced by the WHL are aimed at the global population, the WHL recognizes that most interventions to reduce dietary salt and control hypertension will be at national or community level. To help address this, the WHL has published methods on how to obtain accurate data and statistics to develop national level facts sheets for hypertension and for reducing dietary salt (22).

Credible science

Throughout the history of research on dietary salt, there have been some studies that have found no impact or even a harmful impact of reducing dietary salt. Many of these studies have serious overt methodological flaws or weaknesses such as use of a single spot urine sodium to assess usual salt intake, failure to properly address confounding risk factors, reverse causality (whereby people who are sick less but die more), authors with conflicts of interest, and inappropriate selection of studies for analysis (meta-analysis that include studies lasting less than one week with extreme changes in salt intake) (23-26). It is also within reason that, perhaps to increase citations, several controversial studies have been published in high impact journals.

The WHL has highlighted some of these weaknesses in publications and symposia and has called for the setting of recommended standards for conducting clinical and population research on dietary salt (27,28). An international coalition lead by the WHL has been formed and will develop these recommended standards in 2015. Once the standards are set, regular systematic reviews of the literature will be conducted and, if deemed necessary by the overseeing committee, new recommendations for dietary salt will be developed. The WHL is currently a co-sponsor of a weekly literature summary based on a Medline review of research on dietary salt. Everyone is welcome to sign up for the free service at: http://www.hypertensiontalk.com/science-of-salt-weekly/.

Discussion

High dietary salt is one of the leading risks for death and disability globally with its major adverse health impact being increased blood pressure. The WHL has prioritized reducing dietary salt and works with national and international governmental and non-governmental organizations to advocate for reductions in dietary salt. The WHL website provides a venue for those interested in the WHL activities to stay up to date.

The WHL hosts World Hypertension Day. It is notable that the WHL has allocated this day to promote awareness of the diagnosis of hypertension and knowing your blood pressure between 2014 and 2018. Globally, it is estimated that about 50% of the more than 1 billion people with hypertension are not aware their blood pressure is high. In 2014, over 300,000 people had blood pressure screened for World Hypertension Day and the goal for 2015 is for more than 1 million. It is hoped that reducing dietary salt and increasing awareness of hypertension will be concrete steps to reduce the burden of hypertension related NCD.

Acknowledgements

The authors thank the volunteer members and secretariat of the World Hypertension League workgroups on dietary salt for their contributions and to the staff of the World Hypertension League for their neverending support.

Disclosure: NRC Campbell is a member of World Action on Salt and Health, co-chair of the Pan American Health Organization/World Health Organization Technical Advisory Group on Dietary Salt and the HSF CIHR Chair in Hypertension Prevention and Control. Other authors declare no conflict of interest.

References

1. Lim SS, Vos T, Flaxman AD, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012;380:2224-60.
2. Yi SS, Firestone MJ, Beasley JM. Independent associations of sodium intake with measures of body

size and predictive body fatness. Obesity (Silver Spring) 2015;23:20-3.
3. Amer M, Woodward M, Appel LJ. Effects of dietary sodium and the DASH diet on the occurrence of headaches: results from randomised multicentre DASH-Sodium clinical trial. BMJ Open 2014;4:e006671.
4. Farez MF, Fiol MP, Gaitán MI, et al. Sodium intake is associated with increased disease activity in multiple sclerosis. J Neurol Neurosurg Psychiatry 2015;86:26-31.
5. de Wardener HE, MacGregor GA. Harmful effects of dietary salt in addition to hypertension. J Hum Hypertens 2002;16:213-23.
6. Wang XQ, Terry PD, Yan H. Review of salt consumption and stomach cancer risk: epidemiological and biological evidence. World J Gastroenterol 2009;15:2204-13.
7. D'Elia L, Rossi G, Ippolito R, et al. Habitual salt intake and risk of gastric cancer: a meta-analysis of prospective studies. Clin Nutr 2012;31:489-98.
8. World Health Organization. A global brief on hypertension: silent killer, global public health crisis. World Health Day 2013. Report, 1-39. 2013. Geneva, Switzerland, World Health Organization.
9. United Nations General Assembly. Note by the Secretary-General transmitting the report of the Director-General of the World Health Organization on the prevention and control of non-communicable diseases. Report, 1-19. 12-10-2013. New York, USA, Department for General Assembly and Conference Management.
10. Committee on Public Health Priorities to Reduce and Control Hypertension in the U.S. Population, Institute of Medicine of the National Academies. A Population-Based Policy and Systems Change Approach to Prevent and Control Hypertension. Report, v-173. 2010. Washington, DC, USA, National Academies Press.
11. Campbell NR, Correa-Rotter R, Cappuccio FP, et al. Proposed nomenclature for salt intake and for reductions in dietary salt. J Clin Hypertens (Greenwich) 2015;17:247-51.
12. Powles J, Fahimi S, Micha R, et al. Global, regional and national sodium intakes in 1990 and 2010: a systematic analysis of 24 h urinary sodium excretion and dietary surveys worldwide. BMJ Open 2013;3:e003733.
13. Brown IJ, Tzoulaki I, Candeias V, et al. Salt intakes around the world: implications for public health. Int J Epidemiol 2009;38:791-813.
14. Mozaffarian D, Fahimi S, Singh GM, et al. Global sodium consumption and death from cardiovascular causes. N Engl J Med 2014;371:624-34.
15. World Health Organization. WHO Guideline: Sodium intake for adults and children. Report, i-46. 2012. Geneva, Switzerland, WHO Press.
16. Campbell NC, Lackland DT, Lisheng L, et al. The world hypertension league: a look back and a vision forward. J Clin Hypertens (Greenwich) 2015;17:5-6.
17. Campbell NR, Niebylski ML; World Hypertension League Executive. Prevention and control of hypertension: developing a global agenda. Curr Opin Cardiol 2014;29:324-30.
18. Campbell N, Lackland D, Chockalingam A, et al. The World Hypertension League and International Society of Hypertension call on governments, nongovernmental organizations, and the food industry to work to reduce dietary sodium. J Clin Hypertens (Greenwich) 2014;16:99-100.
19. Mente A, O'Donnell MJ, Yusuf S. The population risks of dietary salt excess are exaggerated. Can J Cardiol 2014;30:507-12.
20. Campbell NR, Lackland DT, Niebylski ML. 2014 dietary salt fact sheet of the World Hypertension League, International Society of Hypertension, Pan American Health Organization technical advisory group on cardiovascular disease prevention through dietary salt reduction, the World Health Organization collaborating centre on population salt reduction, and World Action on Salt & Health. J Clin Hypertens (Greenwich) 2015;17:7-9.
21. Campbell NR, Lackland DT, Niebylski ML, et al. High blood pressure: why prevention and control are urgent and important: a 2014 fact sheet from the World Hypertension League and the International Society of Hypertension. J Clin Hypertens (Greenwich) 2014;16:551-3.
22. Campbell NR, Lackland DT, Lisheng L, et al. Using the global burden of disease study to assist development of nation-specific fact sheets to promote prevention and control of hypertension and reduction in dietary salt: a resource from the world hypertension league. J Clin Hypertens (Greenwich) 2015;17:165-7.
23. Campbell NR, Lackland DT, MacGregor GA. Dietary sodium: a perspective on recent sodium evidence--its interpretation and controversies. J Clin Hypertens (Greenwich) 2013;15:765-8.
24. Appel LJ, Whelton PK. Flawed evidence should not derail sound policy: the case remains strong for population-wide sodium reduction. Am J Hypertens

2013;26:1183-6.
25. Cobb LK, Anderson CA, Elliott P, et al. Methodological issues in cohort studies that relate sodium intake to cardiovascular disease outcomes: a science advisory from the American Heart Association. Circulation 2014;129:1173-86.
26. Neal B. Dietary salt is a public health hazard that requires vigorous attack. Can J Cardiol 2014;30:502-6.
27. Campbell NR, Lackland DT, Niebylski ML, et al. Is reducing dietary sodium controversial? Is it the conduct of studies with flawed research methods that is controversial? A perspective from the World Hypertension League Executive Committee. J Clin Hypertens (Greenwich) 2015;17:85-6.
28. Campbell NR, Appel LJ, Cappuccio FP, et al. A call for quality research on salt intake and health: from the World Hypertension League and supporting organizations. J Clin Hypertens (Greenwich) 2014;16:469-71.

Cite this article as: Campbell NR, Lackland DT, Lisheng L, Zhang XH, Nilsson PM, Niebylski ML; the World Hypertension League Executive. The World Hypertension League: where now and where to in salt reduction. Cardiovasc Diagn Ther 2015;5(3):238-242. doi: 10.3978/j.issn.2223-3652.2015.04.08

