Salt intake and Iodine Deficiency: A public health quandary

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Setting the scene

Salt by far carries the most evidence of all dietary factors causing cardiovascular disease. Evidence includes genetic and animal studies, epidemiological and intervention studies, and also treatment trials. It has been shown that reducing salt intake by half (approximately 6g/day) would result in a 5mmHg decrease in systolic blood pressure [(1).] This could equate to a 24% reduction in strokes and an 18% reduction in coronary heart disease. If this was the case 2.5million deaths due to strokes and heart attacks could be prevented worldwide each year [(2), (3).]

Iodine deficiency (IDD) is a major public health concern, posing a particular threat to young children and pregnant women. Iodine deficiency is the most significant cause of preventable brain damage in children, this being the driving force behind interventions to eliminate it. When iodine requirements are not met in the body, the result is hypothyroidism, since thyroid hormone synthesis is impaired. IDD is mainly controlled by food fortification with iodine. The most commonly used vehicle is salt. Salt intake however increases risk of hypertension and stroke. Here poses a potential problem. Understanding the patterns of Iodine deficiency, salt intake and hypertension will better enable us to make recommendations to enhance public health.

Aim

The aim of this study is to assess the prevalence of Iodine deficiency at baseline among men and women living in rural and semi urban villages in the Ashanti Region of Ghana, West Africa.

Monitoring the populations iodine status is necessary to give us a better understanding of dietary habits and aid us in the quest against hypertension and Iodine deficiency.

Method

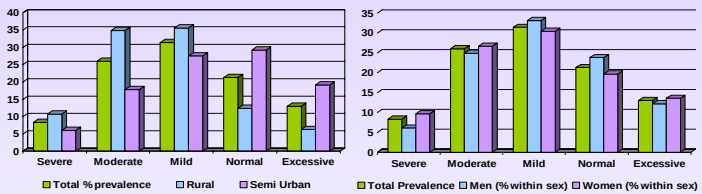
The analysis will be stratified by rural versus semi-urban; men versus women. Locality and gender differences in urinary Iodine shall be compared using a 2-sample t test. Iodine deficiency is defined as UI < 100ug/ l. UI> 300ug/l is excessive and could result in hyperthyroidism and iodine toxicity.

The twelve villages chosen in the Ashanti region of Ghana communicated little with each other, as roads were generally unpaved and transport was not available. Six villages were considered to be rural, as they generally lacked electricity and piped water, had a small population and are some distance away from the Kumasi. The main occupation was farming. The remaining six villages were designated semi- urban. They were mostly closer to Kumasi and usually had electricity. The baseline characteristic of the study are: 997 participants, 619 females and 378 males (63% versus 38%.) 475 rural and 522 semi urban participants (47.64% versus 52.36%)

Results

There were 655 cases with some form of Iodine deficiency, from mild to severe, (242 men and 413 women, 386 rural and 269 semi urban) giving an overall prevalence of Iodine Deficiency (<100ug/l) at 64.7%. 21% of the population were within the desirable range of Iodine level. Iodine deficiency was more prevalent in rural dwellers than semi-urban dwellers (386 (81%) versus 269 (50.7%)) Iodine excess has a 13% total prevalence rate. 19.2 % of semi urban dwellers suffer from excess iodine compared to 6.3% of rural dwellers. Using a Chi-square test it has been shown that there is not a statistically significance difference between male and female group in terms of iodine deficiency (*P* =0.152.) However, using the same test it has been shown that there is a statistically significant difference between those living in a rural setting and those living in an urban setting (*P*<0.0001) Logistic regression showed that those living in rural areas are four times more
likely to be iodine deficient.

Graphs to show the prevalence of iodine deficiency between rural and urban dwellers, men and women.



Discussion

Our results show that Iodine deficiency is not being adequately tackled in the rural communities of Ghana. The rural population may not be exposed to public health initiatives, and health policy needs to think operationally. It has be hypothesized that the rural communities are consuming unfortified salt, (due to differences in price) therefore, if this is in fact true these communities are neither gaining the benefits of iodine intake or reduced salt intake. The inequalities between semi urban and rural iodine status highlights how health policy goals need to pay attention to access to health and specific barriers of poorer communities (such as location, cost, education) which distinguish them from there more wealthy counterparts.
To meet the Iodine requirements of the population it is currently recommended to add 20 to 40 parts per million (ppm) of iodine to salt. This however assumes an average salt intake of 10g per capita/ day [(4).] National nutritional policy and or cardiovascular diseases prevention policy need to address salt intake. The current population nutrient intake goal for salt intake is < 5g/day [(5) (6)] as recommended by the WHO. Here lies a discrepancy and WHO needs to revisit its recommended levels of salt iodization until an alternative vehicle for salt fortification is found. Since IDD is a major public health problem and the main strategy to control IDD is salt iodization, conflicting public health messages may result in confusion. Since salt intake carries with in an increase risk of cardiovascular disease other food stuff needs to be investigated for iodine fortification. In the past milk, bread and water have all been iodized with salt, and in fact, iodized oil is recommended in populations living in severely endemic areas with no access to iodized salt.
Future research needs to look at the prevalence and associated risks of iodine excess.

URSS

The URSS has given me a greater insight into the discipline of epidemiology and the complexities of health policy. It has increased my understanding into statistical analysis. I am grateful for the opportunity that the scholarship has given me.

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