

Rice Consumption and Hypertension

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Abstract

Arsenic in the drinking water is the cause of hypertension. Studies claiming this finding included peoples in Bangladesh, Inner Mongolia, China and Taiwan. Rice consumption could include ingestion of natural arsenic from the environment. A study in Bangladesh confirmed this fact, because groundwater contaminated with environmental arsenic is used widely for the cultivation of the main food crop, rice. It was found that the greater the aggregate arsenic intake, the greater the occurrence of hypertension. The United States Food and Drug Administration informs that unlike other food grains, rice grains pick up arsenic from the soil and water. We are informed that people excrete the inorganic arsenic and the mono and di-methylated metabolites in the urine. The particular reference also informed that ingested arsenic in fish is excreted in two days. It is argued in this work that for Asians and others who consume rice daily, there is always some level of arsenic in body. Hence, a link is deduced between daily rice consumption and incremental rise in blood pressure, which may or may not lead to hypertension.

Keywords: Arsenic; Water; Paddy; Blood pressure

Facts and the Deduction

Arsenic in the drinking water is the cause of hypertension, as demonstrated in the studies performed and reported in references [1-4]. These studies included peoples in Bangladesh, Inner Mongolia, China and Taiwan. Reference [5] is a review article regarding arsenic and hypertension. In this review of 2011, it was concluded that “a positive association between elevated arsenic exposure and the prevalence of hypertension” [5] was found, but the repercussions of this link from a causal point-of-view needs more study. Arsenic occurs naturally in the crust of our planet Earth [6]. It is present in two hundred or more different compounds, arsenopyrite being the most common mineral. Rice consumption commonly include arsenic from the environment, whether grown in different nations in Asia or in the United States of America (USA). A study in Bangladesh re-affirmed this fact, because groundwater contaminated with environmental arsenic is used extensively for the agriculture of rice, the principal grain [7]. In [1], it was found that the greater the aggregate arsenic intake, the greater the occurrence of hypertension.

According to the U. S. Food and Drug Administration, as it grows rice grains pick up arsenic from the water and the ground, unlike other grains [8]. Most other food crops do not show this characteristic of rice. Also of interest is that some sea food contains significant quantities of organic arsenic. The USFDA has yet to set up standards with regards acceptable levels of arsenic in rice and rice products [8]. In comparison, USFDA has set up acceptable levels of arsenic in apple juice in 2013, to be the same as that as acceptable levels in drinking water set by the U.S. Environmental Protection Agency, i.e. ten parts per billion.

In [9], we are informed that people excrete the inorganic arsenic and the mono and di-methylated metabolites in the urine. The reference also informed that ingested arsenic in fish is excreted in two days. However, it is a common practice for Asians, even those who have immigrated to Western Nations, to consume rice daily. Many in Asia consume rice three

times a day. It is a simple deduction that some level of arsenic exists in the body of Asians and others who consume rice daily. In other words, the characteristic discovered about arsenic in raising the blood pressure will generally last at least two days. Based on this deduction, it is not unreasonable that the blood pressure could be incrementally higher among Asians and others who consume rice daily, compared to others who consume other grains instead. Whether this increment will lead to hypertension is not obvious, and needs careful scientific studies.

In the past, there was even a trial to use a rice diet as a therapy for hypertensive vascular disease [10]. Hence, the deduction in the current work is rather new. It definitely goes against the premise used in [10] which was published in 1948. There was also a study regarding high blood pressure and salt consumption among the Japanese [11]. It was found that there were significant difference in salt ingestion, and great quantities (greater than 20 g) of salt were eaten in the north-eastern region where the mortality owing to apoplexy and the blood pressure level of the residents were high. The reduction of salt is a ubiquitous advice for hypertensive patients in Asia. References about salt and hypertension include [12,13]. In [14], it was reported about the controversy regarding the link between sodium consumption and hypertension.

Discussion and Conclusion

As it is all over the world, metabolic syndrome in Asians does occur more frequently among persons of a certain maturity. Asians are among the various minority groups who are more susceptible to metabolic syndrome than the Caucasian majority in the USA. Metabolic syndrome is a group of four risk factors: blood pressure of 135/85 mm Hg or greater, blood sugar above the recommended fasting glucose level of 100 mg/dL, unhealthy cholesterol levels, and large amounts of abdominal fat [15]. There are different measures of unhealthy cholesterol levels for men and women, and ditto for the waistline measure with respect to abdominal fat. One is diagnosed as having metabolic syndrome when one has three of the four risk factors [15]. Among factors that lead to these risk factors

include insulin resistance, which can be discounted if one has not been diagnosed with Type 1 diabetes or Type 2 diabetes. Hormonal imbalance is also another culprit, and is commonly accepted that this occurrence does increase with age. Obesity is also a significant factor [15], especially abdominal fat or fat around the stomach area. The last factor is having a diet full of unhealthy processed foods (processed meats have been pronounced carcinogenic by the World Health Organization [16-20]) and not performing enough activity regularly.

It can be seen that the complex metabolic syndrome, at one time referred to as 'Syndrome X' [15], can complicate matters in any mature person. Thus, a complication arises to hinder an easy deduction that hypertension can result from daily arsenic intake of rice, when discussing mature persons. In other words, for a mature person who eats rice daily, and who is not afflicted with metabolic syndrome, there might be an incremental component in the person's blood pressure which is due to arsenic in the body. Large population scientific studies need to be done to arrive at a conclusion. As for the possibility of increased rates of metabolic syndrome in Asians who eat rice daily; it would only come after large population scientific studies regarding more evidence that rice consumption is a major factor.

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This work is dedicated to all the people who eat rice, especially those who consume rice as a staple.

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