THE SODIUM PREVALENCE IN CARBONATED SOFT DRINKS SOLD IN BRAZIL

PREVALÊNCIA DE SÓDIO NOS REFRIGERANTES VENDIDOS NO BRASIL

LA PREVALENCIA DE SODIO EN LAS BEBIDAS GASEOSAS VENDIDAS EN BRASIL

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ABSTRACT

The carbonated soft drinks intake has changed the children eating habits. This factor may be directly associated with arterial hypertension due the high consumption of sodium present in foods and drinks industrialized. This study was to compare sodium levels between two different types of carbonated soft drinks, carbonated sugar drinks and diet drinks to define what type of drink has the lowest sodium content and alerting healthcare professionals about the presence of sodium in industrialized beverages. The study included labels of carbonated soft drinks n = 33 – sugar drinks (n = 21) or diet drinks (n = 12) – of five different flavors.All carbonated soft drinks evaluated have sodium in its composition. However, the sodium presence in carbonated sugar drinks was significantly lower when compared with carbonated diet drinks (69.05 ± 16.55 vs. 145.30 ± 47.36mg Na/l, respectively).Studies to identify children's eating habits related with increased consumption of foods and drinks manufactured are needed to identify, reduce and prevent high blood pressure.

KEYWORDS: Sodium, Hypertension, Soft Drinks, child, obesity

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RESUMO

O aumento do consumo dos refrigerantes tem vindo a mudar os hábitos alimentares das crianças brasileiras. Este fator pode ser diretamente associado à hipertensão arterial (HA) devido ao consumo elevado de sódio presente em alimentos e bebidas industrializadas. Comparar os níveis de sódio, descrito nos rótulos dos refrigerantes, para definir que tipo de bebida tem o menor teor de sódio em sua composição e alertar os profissionais de saúde sobre a presença de sódio nos refrigerantes.O estudo incluiu um total de 33 rótulos de refrigerantes, adoçados com açúcar (n=21) ou adoçados artificialmente (n=12) de 5 diferentes sabores.Todos os rótulos avaliados possuem sódio em sua composição. No entanto, a presença de sódio nas bebidas adoçadas com açúcar foi estatisticamente menor quando comparado com as bebidas adoçadas artificialmente (69,05±16,55 vs. 145,30±47,36 mg Na/l). Estudos para identificar os hábitos alimentares das crianças relacionadas com o aumento do consumo de alimentos industrializados são necessários para identificar, reduzir e prevenir a HA.

DESCRITORES: Sódio, hipertensão, refrigerantes, crianças, obesidade

RESUMEN

Antecedentes: El aumento del consumo de bebidas gaseosas ha ido cambiando los hábitos alimenticios de los niños brasileños. Este factor puede ser directamente asociada con la hipertensión arterial, debido al alto consumo de sodio presente en los alimentos y bebidas industrializados.Objetivo: El presente estudio fue comparar los niveles de sódio, descrito en las etiquetas de las bebidas gaseosas, entre dos tipos diferentes de bebidas gaseosas para definir qué tipo de bebida tiene el más bajo contenido de sodio y alertar a los profesionales de la salud acerca de la presencia de sodio en las bebidas industrializadas.Metodología: El estudio incluyó un total de 33 etiquetas de bebidas gaseosas, endulzado con azúcar (n=21), o endulzado artificialmente (n=12) de los 5 sabores diferentes. Resultados: Todas las etiquetas han evaluado sodio en su composición. Sin embargo, la presencia de sodio en las bebidas endulzadas con azúcar fue menor en comparación con las bebidas endulzadas artificialmente (69.05 ± 16,55 vs 145,30 ± 47,36 mg Na/l). Conclusión: Los estudios para identificar los hábitos alimenticios de los niños en relación con el aumento del consumo de alimentos y bebidas industrializados son necesarios para identificar, reducir y prevenir la hipertensión.

DESCRIPTORES: sodio, hipertensión, bebidas gaseosas, niño, obesity

INTRODUCTION

Elevated blood pressure (Hypertension) affects approximately 1 billion individuals worldwide. This disease is associated with an increased risk of mortality from stroke, cardiovascular disease and renal disease, but also has a negative impact on quality of life[1].

Hypertension is a major public health disease in Brazil, reaching about 15-20% of the population over 18 years. Early detection and continued treatment are priority actions to be taken to reduce morbidity and mortality by cardiovascular diseases[2,3]. Hypertension can not be eliminated because there are no vaccines to prevent it; however, its incidence can be decreased by reducing risk factors like obesity, sedentary lifestyle, smoking, stress, excessive alcohol intake and high salt intake[4]. Furthermore, blood pressure is also influenced by non-modifiable risk factors like age, heredity, gender, multiethnic black and certain medications. Therefore, people who are predisposed to these conditions should adopt health habits and take pharmacotherapy to prevent cardiovascular diseases[5].

The objective of this study was to evaluate the sodium amount in carbonated soft drinks sold in Brazil and alert health care professionals and the general population about the presence of sodium in carbonated soft drinks.

METHODS

The study included a total of 33 labels of carbonated soft drinks with or without sugar addition of five different flavors: Cola (4 with sugar and 4 diet), guarana (6 with sugar and 5 diet), grape (3 with sugar and 1 diet), orange (4 with sugar and 1 diet) and lemon (4 with sugar and 1 diet). The drinks were purchased in local supermarkets in São Luis city (Maranhão, Brazil) and sent to the Laboratory of Biochemistry, State University of Maranhão.

Two trade marks were excluded because they did not show on their labels the amount of sodium, claiming that the percentage of sodium was not significant (an international and other regional trade marks).

The results are presented as means ± standard deviation (SD). Statistical comparison of the groups was performed using the analysis ToolPak added to Microsoft® Office Excel® 2007. The following tests were used: (1) Mann-Whitney test to compare means between two independent groups; (2) analysis of variance (ANOVA) to compare the average value of each component of sugar soft drinks and diet drinks and (3) Spearman® correlation coefficient r to measure the degree of association between two variables, with the level of significance set at $P < 0.05$.

This study was conducted from March/2012 to July/2012 as part of a research project which aims to measure blood pressure and body mass index in the population of Maranhão – Brazil (FAPEMA/CNPq: PPP – 00969/11). The project was approved by the Ethical Committee in Research of the University Hospital of the Federal University of Maranhão, protocol number: 004967/2011-20.

RESULTS

Table 1 shows the samples profile giving mean, standard deviation (SD), minimum and maximum of sodium contents in carbonated soft sugar drinks. No significant differences in sodium levels were found among the five groups of sugar drinks. In carbonated soft drinks with sugar (n = 21) there was no correlation between the presence of sodium and sugar to the 5% level (r = 0.29, p = 0.24).

Table 1: Sodium content in carbonated sugar drinks (Sodium concentration mg/l)

Variable	n	Mean	SD	Maximum	Minimum
Cola	4	75.00	26.45	110	50
Guarana	6	66.67	12.50	80	55
Orange	4	70.00	12.24	85	60
Lemon	4	60.00	10.80	75	50
Grape	3	76.67	24.66	105	60

Figure 1 illustrates the sodium content of the sugar-sweetened beverages which is statistically lower (69.05 ± 16.55mg/l, n=21) when compared with the diet beverages (145.30 ± 47.36mg/l, n=12, p<0.005).

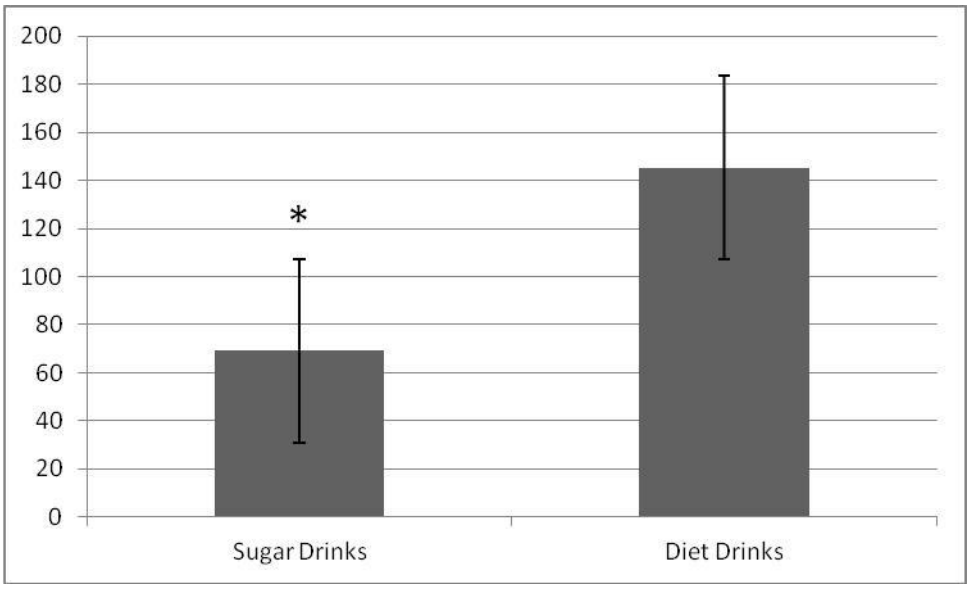

Figure 1

Sodium concentration (mg/l) in carbonated sugar drinks or diet drinks; the results represent the mean ± SD (n= 21 and n= 12, respectively) - * $p < 0.005$.

DISCUSSION

The manufactured foods have high sodium levels, not only by the addition of salt, but also by the addition of various preservatives required for the modification of its properties, so people with a hypertension history in the family should be advised to avoid or have knowledge of the salt presence in foods and beverages mainly in industrialized preserves like juices, soft drinks and mineral water. The people should be alerted to the fact that some artificial sweeteners contain sodium in its composition and if consumed in excess can contribute to increased blood pressure[6,7].

Sodium is essential to maintain the body's metabolism in balance and the present restriction of salt intake is not recommended for normotensive population[5]. However, in Brazil, the consumption of carbonated soft drinks is high and the popularity of these drinks has been increasing among young people and families with small children[6].

As most of the high-sodium diet comes from manufactured foods, government policy intervention to reduce the sodium addition in processed products would lead the population to the habit of reducing intake of salt, which could lead to a significant additional benefit in

preventing hypertension in children and adults[8]. The World Health Organization (WHO) and the Food and Agriculture Organization of the United Nations (FAO) recommend a sodium chloride average daily intake less than 5g per day to prevent chronic diseases[9].

Our findings demonstrate that there are no significant differences in sodium contents in carbonated sugar drinks. However guarana and lemon are the drinks with minor sodium amounts, while in grape and orange drinks higher sodium amounts were found. Moreover, the diet beverages have sodium levels significantly higher when compared to sugar-sweetened drinks. These findings are in agreement with previous studies reporting that diet drinks have about twice the average sodium compared with sugar-sweetened beverages, because they contain artificial sweeteners[6].

Obesity is associated with several chronic diseases, among which we emphasize the metabolic syndrome (MS) that represents the union of several abnormalities such as insulin resistance, dyslipidemia and high blood pressure that may contribute to increased risk of cardiovascular disease and premature death[4]. Recent studies performed in children and adolescents 2-18 years of age showed that 59.7% of the population aged 10-18 years had MS and high triglycerides, showing that MS is already a reality in many obese children and adolescents which reinforces the need to promote and encourage adherence to a healthier lifestyle, which leads to prevention of cardiovascular disease in this population[10].

For control of blood pressure including nonhypertensive and older persons it is recommended a diet with low sodium intake[11]. Therefore, other studies involving children with more suitable methodologies are needed to be developed to try to elucidate further aspects of high-sodium diet in the predisposition to hypertension and cardiovascular problems.

CONCLUSIONS

Finally, we emphasize that the industrialized juices, mineral water and sparkling mineral water also have sodium in its composition and reinforce the practice of daily exercise, a diet rich in fruits, vegetables, low salt intake and replacement of industrialized beverages for purified water. These attitudes will reflect a healthier lifestyle for children and adults, being seen as responsible for preventing and reducing hypertension.

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