Clinical and Medical Case Reports

Editorial Open Access

The Standard of World Meal Intake for Fat and Carbohydrate has Changed

Hiroshi Bando*

Medical Research, Tokushima University, Tokushima, Japan

***Corresponding author:** Hiroshi Bando, Medical Research, Tokushima University, Nakashowa 1-61, Tokushima 770-0943, Japan, Tel: +81-90-3187-2485; Fax: +81-88-603-1030; E-mail: pianomed@bronze.ocn.ne.jp

Received Date: September 25, 2017; **Accepted Date:** September 28, 2017; **Published Date:** October 07, 2017

Editorial

The standard nutrition has been changed in several decades. From mid-20th century, it has been believed that abstinence of lipids would prevent arteriosclerosis. One of the source would be from classical Seven Countries study [1]. At that time, fatal diseases were classified such as all causes, all causes less infective and parasitic diseases and violence, diseases of the circulatory system and degenerative heart disease [2].

There was a correlation between mortality rate from degenerative heart disease and fat intake ratio as percent of total [1]. It was significant linear correlation: 1) highest country is USA with 7.0 in deaths at 1000 and 40% in fat intake ratio, 2) lowest country is Japan with 0.6 in death/1000 and 7% in fat intake, 3) Canada, Australia, England and Italy were linearly situated between USA and Japan.

In the 1970s, exceptionally high mortality rates of cardiovascular disease (CVD) was observed in Finland, and they started the health program. It concentrated heavily on changing the population's diet, especially with respect to the quality of the fat consumed: a reduction in saturated and an increase in unsaturated fat intake [3]. It showed both the feasibility and great potential of CVD prevention and heart health promotion through general dietary changes in the population [4].

After that, there have been lots of nutritional research worldwide concerning the ratio of three major nutrients, influence to cardiovascular disease, saturated and unsaturated fatty acid. High saturated fatty acid diet was supposed to be related to influence the development of cardiovascular disease.

Recently, it has been reported that saturated fatty acids and lipids does not affect the mortality rate or cardiovascular disease incidence rate, as well as the converse reports that the risk decreases [5,6]. There is no significant evidence for concluding that dietary saturated fat is associated with an increased risk of CVD or coronary heart disease (CHD) with 5-23 year follow-up of 347,747 subjects, 11,006 developed CHD or stroke [5]. However, further data would be necessary for the rejecting the saturated fat hypothesis [6,7].

There has been a large-scale epidemiological study, which is called "The Prospective Urban Rural Epidemiology (PURE) study" [8]. It plans to recruit approximately 140,000 individuals residing in >600 communities in 17 low-, middle-, and high-income countries around the world [8].

As one of PURE study, the consumption of fruit and vegetables was investigated [9]. Consumption is rather low worldwide, particularly in low-income countries, and this is associated with low affordability. Policies worldwide should enhance the availability and affordability of fruits and vegetables.

In 2017, another PURE study was reported [10]. They studied 125 287 participants from 18 countries in North America, South America, Europe, Africa, and Asia, and reported that replacement of saturated fatty acids with carbohydrates was associated with the most adverse effects on lipids, whereas replacement of saturated fatty acids with unsaturated fats improved some risk markers [10].

Furthermore, associations of fats and carbohydrate intake with cardiovascular disease and mortality in 18 countries were reported [11]. It showed that higher carbohydrate intake was associated with an increased risk of total mortality (HR 1.28). On contrast, it showed that higher total fat was associated with lower total mortality (HR 0.77) and higher saturated fat intake was associated with lower risk of stroke (HR 0.79). Total fat and saturated and unsaturated fats were not significantly associated with risk of myocardial infarction or cardiovascular disease mortality.

According to these data, lower intake of carbohydrate about 50-55% and higher intake of fat about 35% were recommended [11]. However, enough amount of protein would be necessary. Then, we suggest that less carbohydrate would be better for healthier life with adequate balance of 3 nutrients.

In many countries and districts, the ratio of carbohydrate intake has seems to be around 50 – 70%. According to the data [10], the ratio less than 50% and more than 70% is shown in the following district: China, 5.5%, 42.6%; South Asia, 7.7%, 33.2%; Africa, 12.3%, 28.9%; South America, 25.5%, 14.5%; Middle East, 29.3%, 0.9%; Europe and north America, 39.7%, 1.5%, respectively [10].

Furthermore, higher economic state tends to indicate higher fat intake, lower carbohydrate intake and better medical circumstance, which would be the limitation of various research. Consequently, we have to consider multiple axes in discussing the ideal or adequate ratio of fat and carbohydrate in various situations worldwide.

Taking several data with cultural, historical and economic situation into consideration, it is rather difficult to propose the ideal proportion of three main nutrients. However, we expect the accumulation of significant nutritional reports about better meal components in the world, leading to less metabolic syndrome and arteriosclerosis.

In relation to these comment mentioned above, recent clinical and research concerning low carbohydrate diet (LCD) must be considered. Atkins and Bernstein started LCD with successful weight reduction in Europe and North American [12,13]. There was Dietary Intervention Randomized Controlled Trial (DIRECT) study, in which weight reduction was investigated in low fat, Mediterranean and LCD for 2

years [14]. The mean weight losses were 3.3 kg, 4.6 kg, and 5.5 kg, respectively. This is the milestone of the beneficial effects for LCD [14].

On succession, the efficacy of LCD for 6 years in DIRECT study was reported [15]. There have been various reports and discussion concerning the comparison between calorie restriction (CR) and LCD [16,17]. Furthermore, the influences of LCD for arteriosclerosis and cardiovascular disease were investigated [18-21].

As for Japan, authors and colleagues have started LCD and reported clinical studies including 2699 cases of LCD with remarkable weight reduction [22,23]. We also clarified that diabetic pregnant women can be treated successfully with LCD, and that remarkable elevated ketone bodies were observed in the axes of fetus, placenta, newborn and mother, suggesting that ketone bodies would generate necessary energy in the axes [24].

In the clinical practice, the remarkable beneficial efficacy for LCD would be 1) successful weight reduction [23]. 2) elevated ketone bodies with various beneficial effects to human organs [23,25,26], 3) three different LCD meals which are petit LCD, standard LCD and super LCD with carbohydrate ratio in 40%, 26%, 12%, respectively [27], 4) decrease of triglyceride level [28], 5) rapid decrease of daily profile of blood glucose which can be calculated as Morbus (M) value indicating average and fluctuation of glucose in a day [29].

This editorial was on the topics of the ratio for fat, carbohydrate, LCD in various meal and nutritional treatment. These speculations would be useful for the urgent problem worldwide, which is increasing metabolic syndrome (Met-S) such as obesity and diabetes [30]. International Diabetes Federation (IDF) summarized the current situation and problems in the world [31]. Diabetic prevalence will increase from 8.8% in 2015 to 10.4% in 2040 [32].

IDF summarized Standards of Medical Care in Diabetes in 2015 [33]. The important points were that 1) Monitoring carbohydrate intake, whether by carbohydrate counting or experience-based estimation, remains critical in achieving glycemic control in eating patterns and macronutrient distribution, and 2) the amount of dietary saturated fat, cholesterol, and trans fat recommended for people with diabetes is the same as that recommended for the general population in dietary fat.

In summary, to prevent and treat arteriosclerosis and Met-S worldwide, we can apply adequate nutritional management such as less carbohydrate and enough fat with good quality.

References

1. Keys A (1953) Atherosclerosis: a problem in newer public health. J Mt Sinai Hosp NY 20: 118-139.
2. World Health Organization (1948) Manual of the international statistical classification of diseases, injuries and causes of death, sixth revision of the international lists of diseases and causes of death. WHO, Geneva.
3. Puska P, Tuomilehto J, Nissinen A, Vartiainen E (1995) The North Karelia Project: 20-year results and experiences. Helsinki, National Public Health Institute.
4. Puska P (2009) Fat and heart disease: yes we can make a change--the case of North Karelia (Finland). Ann Nutr Metab 54 :33-8.
5. Siri-Tarino PW, Sun Q, Hu FB, Krauss RM (2010) Meta-analysis of prospective cohort studies evaluating the association of saturated fat with cardiovascular disease. Am J Clin Nutr 91: 535-46.
6. Malhotra A (2013) Saturated fat is not the major issue. BMJ 347: f6340.
7. Clifton P (2013) We need more data before rejecting the saturated fat hypothesis. BMJ 347: f6847.
8. Teo K, Chow CK, Vaz M, Rangarajan S, Yusuf S (2009) The Prospective Urban Rural Epidemiology (PURE) study: Examining the impact of societal influences on chronic noncommunicable diseases in low-, middle-, and high-income countries. Am Heart J 158: 1-7.
9. Miller V, Yusuf S, Chow CK, Dehghan M, Corsi DJ, et al. (2016) Availability, affordability, and consumption of fruits and vegetables in 18 countries across income levels: findings from the Prospective Urban Rural Epidemiology (PURE) study. Lancet Glob Health 4: e695-703.
10. Mente A, Dehghan M, Rangarajan S, McQueen M, Dagenais G, et al. (2017) Association of dietary nutrients with blood lipids and blood pressure in 18 countries: a cross-sectional analysis from the PURE study. Lancet Diabetes Endocrinol 5: 774 - 787
11. Dehghan M, Mente A, Zhang X, Swaminathan S, Li W, et al. (2017) Associations of fats and carbohydrate intake with cardiovascular disease and mortality in 18 countries from five continents (PURE): A prospective cohort study. Lancet.
12. Atkins R (1998) Dr. Atkins' new diet revolution. Avon books, New York
13. Bernstein RK (2007) Dr. Bernstein's Diabetes solution: The complete guide to achieving normal blood sugars. Little, Brown US, New York
14. Shai I, Schwarzfuchs D, Henkin Y, Shahar DR, Witkow S, et al. (2008) Weight loss with a low-carbohydrate, mediterranean, or low-fat diet. N Engl J Med 359: 229–241.
15. Schwarzfuchs D, Golan R, Shai I (2012) Four-year follow-up after two-year dietary interventions. N Engl J Med 67: 1373-1374
16. Atallah R, Filion KB, Wakil SM, Genest J, Joseph L, et al. (2014) Long-term effects of 4 popular diets on weight loss and cardiovascular risk factors: A systematic review of randomized controlled trials. Circ Cardiovasc Qual Outcomes 7: 815-827.
17. Feinman RD, Pogozelski WK, Astrup A, Bernstein RK, Fine EJ, et al. (2015) Dietary carbohydrate restriction as the first approach in diabetes management: Critical review and evidence base. Nutrition 31: 1-13.
18. Lagiou P, Sandin S, Lof M, Trichopoulos D, Adami HO, et al. (2012) Low carbohydrate-high protein diet and incidence of cardiovascular diseases in Swedish women: prospective cohort study. BMJ 26: 344-e4026.
19. Nakamura Y, Okuda N, Okamura T, Kadota A, Miyagawa N, et al. (2014) Low-carbohydrate diets and cardiovascular and total mortality in Japanese: a 29-year follow-up of NIPPON DATA80. Br J Nutr 112: 916-24.
20. Hu T, Yao L, Reynolds K, Whelton PK, Niu T, et al. (2015) The effects of a low-carbohydrate diet vs. a low-fat diet on novel cardiovascular risk factors: A randomized controlled trial. Nutrients 7: 7978-94.
21. Mansoor N, Vinknes KJ, Veierød MB, Retterstøl K (2016) Effects of low-carbohydrate diets v. low-fat diets on body weight and cardiovascular risk factors: a meta-analysis of randomised controlled trials. Br J Nutr 115: 466-79.
22. Ebe K, Ebe Y, Yokota S, Matsumoto T, Hashimoto M, et al. (2004) Low carbohydrate diet (LCD) treated for three cases as diabetic diet therapy. Kyoto Med Ass J 51: 125-129.
23. Bando H, Ebe K, Nakamura T, Bando M, Yonei Y (2016) Low carbohydrate diet (LCD): Long and short-term effects and hyperketonemia. Glycative Stress Research 3: 193-204.
24. Muneta T, Kawaguchi E, Nagai Y, Matsumoto M, Ebe K, et al. (2016) Ketone body elevation in placenta, umbilical cord, newborn and mother in normal delivery. Glycative Stress Research 3: 133-140.
25. Watanabe S, Hirakawa A, Aoe S, Fukuda K, Muneta T (2016) Basic ketone engine and booster glucose engine for energy production. Diabetes Res Open J 2: 14-23.
26. Watanabe S, Hirakawa A, Utada I, Aoe S, Moriyama S, et al. (2017) Ketone body production and excretion during wellness fasting. Diabetes Res Open J 3: 1-8.
27. Bando H, Ebe K, Muneta T, Bando M, Yonei Y (2017) Clinical effect of low carbohydrate diet (LCD): Case report. Diabetes Case Rep 2: 124.
28. Ebe K, Bando H, Muneta T, Bando, M, Yonei Y (2017) Effect of low carbohydrate diet (LCD) for diabetic patients with hypertriglycemia. Endocrinol Metab 1: 4.

29. Bando H, Ebe K, Muneta T, Bando M, Yonei Y (2017) Effect of low carbohydrate diet on type 2 diabetic patients and usefulness of M-value. Diabetes Res Open J 3: 9-16.

30. Kwon YJ, Lee HS, Le JW (2017) Association of carbohydrate and fat intake with metabolic syndrome. Clinical Nutrition.

31. International Diabetes Federation (IDF) (2013) Diabetes Atlas (6th edn).

32. Ogurtsova K, da Rocha Fernandes JD, Huang Y, Linnenkamp U, Guariguata L, et al. (2017) IDF Diabetes Atlas: Global estimates for the prevalence of diabetes for 2015 and 2040. Diabetes Res Clin Pract 128: 40-50.

33. International Diabetes Federation (IDF) (2015) Standards of medical care in diabetes-2015. Diabetes Care 38: S1-S94.