

Commentary

Clinical diversity of Low Carbohydrate Diet (LCD)

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Commentary

When observing the medical and health situation in the world, diabetes, obesity and metabolic syndrome have been crucial social problems in developed and also developing countries [1]. Especially, the diet therapy would be indispensable which can be continued for long years such as low carbohydrate diet (LCD) and Calorie restriction (CR). LCD was originally begun by Atkins and Bernstein before, and it has been known and popular until now. [2, 3].

After that, there was a meaningful report from Dietary Intervention Randomized Controlled Trial (DIRECT) Group that showed the predominance compared with Mediterranean and Low-Fat Diet for 2 years [4]. Successively, DIRECT group reported the results for 4 years [5]. Thus, several researchers reported the predominance of LCD for weight reduction or HbA1c value [6].

In contrast, authors and colleagues have introduced and developed LCD in Japan for long years [7]. We have continued practice and research of LCD and activities of Japan LCD promotion association, including educational seminars, medical journals / books and presenting in medical society [8].

There has been lots of discussion about LCD and CR for years. LCD has rather superiority to CR diets and low-fat foods in the light of weight control and blood glucose variety in short period [4]. For more than 1 year or more, continuing discussion has found concerning the comparison of LCD and CR [9]. Some reports showed beneficial effect of LCD and others revealed unremarkable difference between them [6, 10, 11].

There is a prospective randomized controlled trial (RCT) that LCD of 130g /day for 6 months reduced HbA1c and BMI more than CR [12]. However, the benefit for LCD after intensive intervention has not always maintained in the light of HbA1c and BMI between LCD and CR. This study was continued and summarized one year after regarding the comparison between LCD and CR. The result showed the beneficial efficacy for the LCD on reduction of HbA1c and BMI, but improved levels did not persist compared with that of CR. However, when combined the data of both groups, HbA1c and BMI values were significantly decreased from the baseline. The superiority of LCD seemed to disappear 1 year after, but those results would suggest the comparative efficacy to improve HbA1c value at least 1 year [12].

As described above, the discussion of the clinical effect for LCD and CR has been continued for long years. However, we cannot induce the final conclusion which is superior. They are various factors involved in the evaluation and measurement of the both methods. The research has been not in vitro research or in vivo study of the same feeds to rat every day, but clinical meal study for human in their ordinary daily life.

In the primary care setting, general efficacy of LCD has been understood rather widely. On the other hand, a problem has been known about whether the LCD continuation is possible, or whether the effect of weight reduction is possible during rather long period. After a while, some patients return to their previous meal style [13]. There are some reports that the effect of LCD can be sustained rather long term [14]. Since there are various influential factors, it will be necessary to investigate related influence into detail analysis [15].

A recent report was found that revealed several results against the previous clinical effect for LCD. There has been the Atherosclerosis Risk in Communities (ARIC) Study which has continued its research development for some decades [16]. The ARIC study has many subjects more than 430 thousand for 25 years [17]. According to the results of ARIC cohort study, they have reported a U-shaped association between the percentage of energy of carbohydrate (mean 48.9%, SD 9.4) and mortality, after calculating for multivariable adjustment. Furthermore, they calculated and compared the total carbohydrate ratio of the diet. As a result, daily meal including high (>70%) percentage or low (<40%) percentage of energy from carbohydrates were observed, in association with elevated mortality rate, and with minimal risk found between carbohydrate content ratio in 50-55% [17].

In order to evaluate the optimal intake amount of carbohydrate for the guidance recommendations associated with certain medical evidence, the protocol included the population-based study of overall carbohydrate consumption [17]. Especially, it investigated the association of carbohydrate intake amount in accordance with mortality and residual lifespan levels. As a daily meal method, LCD was applied for reducing body weight and decreasing the cardiovascular and metabolic risk. At the same time, they recommended to replace of carbohydrate food with other proteins and plant-based fats. This procedure can give the subjects practical approach for daily healthy life in the light of anti-aging medicine [17].

In the practice and research on diabetes, how should we think about the relationship between clinical matters and the Evidence-Based Medicine (EBM)? [18] EBM has not only critically examined evidence, but also considered practicality, reality and individual tastes and situations. Short-term LCD has been effective by conventional reports and may increase the motivation feeling for progressive cure and care for the patients [19]. However, on the other hand, for long-term LCD, we have to consider the required daily calorie and also carbohydrate intake amount. Based on this situation, we would like to aim for Taylor-made diet therapy according to each patient, taking account of feasibility, continuity and safety [20, 21].

In summary, the discussion on the comparison of LCD and CR has been continued for years. The main point would be the clinical efficacy for rather long term. Each report includes each definition of LCD such as the different amount or ratio of carbohydrate in the food. Consequently, further accumulation of the data would be expected for future practice and research development.

Key words: low carbohydrate diet (LCD), Calorie restriction (CR), Dietary Intervention Randomized Controlled Trial (DIRECT), Atherosclerosis Risk in Communities (ARIC), Japanese LCD Promotion Association (JLCDPA)

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