

The Traditional Indian Ocean Diet

TRADITIONAL INDIAN OCEAN DIET WORKING GROUP

ABSTRACT

Dietary advice forms the cornerstone in the management of cardiometabolic disease. Though various national and international guidelines suggest different macronutrient proportions, locally framed person-centric diet prescriptions are likely to have a better compliance. In this article, we propose an indigenous traditional Indian Ocean (TRIO) diet, which constitutes a similar pattern of the dietary practices followed by inhabitants of the Indian Ocean littoral region. The TRIO diet highlights on concepts of procurement, preparation, presentation, prioritization, preservation and partaking and may be a good alternative to the Mediterranean diet followed in western countries.

Keywords: Cardiometabolic disease, person-centric diet prescription, TRIO diet, littoral, Mediterranean diet

BACKGROUND

Metabolic and nutritional diseases are emerging as a major global health care challenge. Diabetes, obesity, hypertension and cardiovascular disease have attained pandemic status, and show no signs of abating.¹ As we try to address these diseases, the role of healthy nutrition is of paramount importance.² Though there are myriad definitions of healthy eating, the term 'Mediterranean diet' is often associated with health protection and promotion.

Current guidelines underscore the need for culturally relevant medical nutrition therapy prescriptions for the prevention and management of metabolic disease, including diabetes.³ While multiple diet patterns are shown to have short-term benefits, the Mediterranean diet is suggested to be one of the most useful diets for long-term health. At the same time, it should be clarified that there is no single dietary plan, which is suited for all people.

THE MEDITERRANEAN DIET

In 2010, UNESCO, defined the Mediterranean diet as a set of skills, knowledges, rituals, symbols and traditions concerning crops, harvesting, fishing, animal husbandry, conservation, processing, cooking and particularly the

sharing and consumption of food. Thus, it includes the production, processing and partaking of food.⁴

Modern medicine discovered the benefits of the Mediterranean diet when Ancel Keys conducted the Seven Countries Study in 1958, providing evidence of its cardiovascular advantages.^{5,6} Balanced use of fiber-rich, antioxidant-rich, unsaturated fatty acid-rich foods, with a lower proportion of animal fats, characterize the Mediterranean diet. The rough proportion of nutrients is 55% to 60% carbohydrates (of which 80% are complex), 10% to 15% proteins (of which 60% are of animal origin) and 25% to 30% fat (mostly olive oil). Nutritionists and policy makers represent the diet as a Food Pyramid, which includes a variety of foods, in the right proportion, taken in moderation.⁷

From an Afro Asian perspective, one limitation of the Mediterranean diet, is its nomenclature. The name might imply that a foreign diet is better, and must supplant locally grown foodstuffs. An unwarranted emphasis on olive oil, which is not easily available and affordable, nor is it appropriate for the Afro Asian style of cooking, might lead to excessive and unnecessary expenditure on food.

THE TRADITIONAL INDIAN OCEAN (TRIO) DIET

In this communication, we attempt to conceptualize and define an Indian Ocean diet, as an authentic and appropriate, alternative to the Mediterranean diet.

The Indian Ocean diet is a diet that is inspired by, and incorporates, the dietary preferences and habits of the peoples who inhabit the littoral countries of the Indian Ocean. We propose the traditional Indian

Address for correspondence

Dr Sanjay Kalra
Dept. of Endocrinology, Bharti Hospital, Karnal, Haryana, India; University Center for Research & Development, Chandigarh University, Mohali, Punjab, India
E-mail: brideknl@gmail.com

Ocean (TRIO) diet as a healthy option for the prevention and management of metabolic diseases.

We define the TRIO diet as the style and method of meal procurement, preparation, preservation, presentation and partaking, followed by the inhabitants of the Indian Ocean littoral region, which contributes to metabolic and overall health.

The Indian Ocean Littoral Region

The Indian Ocean, the third largest ocean in the world, touches the shores of Africa, the Middle East, South and South East Asia, as well as Australia. Though the inhabitants of this vast region represent a seemingly complex and diverse collection of people they are also united in many ways. Age-old trading and travel links have created a “fusion” of cultures, which has influenced cuisines as well.

In this communication, we define the Indian Ocean littoral region as including all the countries and islands which touch the Indian Ocean or are included in it. The authors represent the following countries: Australia, Bangladesh, Indonesia, India, Iran, Kenya, Malaysia, Maldives, Mauritius, Mozambique, Myanmar, Oman, Pakistan, Singapore, South Africa, Sri Lanka, Tanzania, Ghana, Thailand and the United Arab Emirates.

Cooking and dining are a family affair, and sometimes, even a community affair. The sense of sharing (Ubuntu in South Africa) extends to presenting food and preparing food in joint family kitchens.

Most traditional Indian Ocean littoral cuisines are based upon locally available whole grains (rice, wheat, maize), eaten in various forms. In recent years, the proportion of whole grain consumption, as opposed to refined grain intake, has reduced. This is especially true in island states, which import their cereal requirements.⁸

The cereal is usually consumed with dishes that are made of vegetables, legumes and lentils. Coastal cuisines have a strong presence of fish, seafood and fish products. Meat is an integral part of Indian Ocean littoral states, but is not a major contributor to caloric intake in most cuisines.

Beverages such as water, lemonade, hibiscus juice, kokum juice, coconut water, soup, tea and coffee are a prominent part of the Indian Ocean diet. This is a necessity, due to hot weather that prevails throughout much of the year in the region.

Various means of cooking are used across the region, including boiling, steaming, sautéing, baking and frying. In most settings, economy of fuel and economy

are in the interest of parsimony. A wide range of cooking oils is used, as per availability. Coconut oil and palm oil, which are clubbed as ‘tropical oils’ are used in the eastern Indian Ocean littoral region, while mustard oil, peanut (groundnut) oil and clarified butter (ghee) are used elsewhere.⁷

Mustard oil is a liquid oil that is low in saturated fat and is popular in South Asia. Australia, New Zealand and the European Union (27 countries) have established upper limits for tolerable intake of mustard oil. In contrast mustard oil is one of the most popular cooking oils in Asia, particularly in India where it is recommended as a heart-healthy oil by the Lipid Association of India (LAI). However, the US Food and Drug Administration (FDA) has banned the use of mustard oil for cooking.⁹ Fruits are ubiquitous in Indian Ocean diet. Locally available, seasonal fruits are preferred. Some parts of the region, such as the Middle East and South Asia, exhibit a preference for rich (and tasty) desserts.

THE TRADITIONAL INDIAN OCEAN AND MEDITERRANEAN DIET

In most ways, the Indian Ocean diet that we describe is similar to the Mediterranean diet. Reliance on whole grains, vegetables, legumes and fruits is common to both systems. Use of fish is noted in coastal Indian Ocean communities as well as the Mediterranean. Nuts and olive oil, important features of Mediterranean diet, are represented by groundnuts and other cooking oils in the Indian Ocean. Less focus on use of red meat, processed meat and refined cereals is common in both traditional cuisines. Similarly, the concept of an Indian Ocean diet, can be used to create an overarching model that can be customized as per local needs and requirements.

THE HEALTHY TRAY

We suggest the healthy thali (tray) rubric, rather than the pyramid or plate, to represent the Indian Ocean diet.

The healthy tray provides a conceptually practical person-friendly means of representing the food and drink that should be consumed, to the regional population, in order to ensure healthy nutrition and accomplish healthy outcomes. It represents a wholesome and comprehensive method of representing an optimal diet in a person-friendly manner. The healthy tray goes beyond mere nutrition by including culinary science and art in education. The concepts of plating and presentation, along with portion size meal sequencing, can be demonstrated through the tray model.

THE WAY FORWARD

The concept that we share has the potential to become a useful tool for sharing and teaching healthy nutrition. The advantage is its relevance to a vast swathe of the world's population, and the sense of empowerment as well as responsibility that it brings to them. This will hopefully invite more interest, discussion and debate, as well as research in order to achieve this potential. In many countries, the local food is a blend of different cultures. For instance, people from Mauritius enjoy eating locally adapted Chinese cuisine as much as they enjoy Indian cuisine. Blending brings cultural enrichment of existing traditions. However, as much as we are keen to respect our traditions or any associated influences from other cultures, it is our duty to educate our patients on what could be deleterious to their health. For e.g., we may still respect the plating of a particular dish, whilst decreasing the proportion of carbohydrates. Quantity is often overlooked and this issue should be

Table. Components of the TRIO Diet

Procurement/sourcing of food

- Locally grown and available
- Seasonal items
- Fresh food
- Seafood/fish

Preparation

- Local styles of cooking
- Economy in fuel
- Economy in cooking oil
- Addition of locally grown spices

Presentation

- Communal plates
- Moderate/small-sized utensils

Prioritization in meal sequencing and proportions

- Low calorie beverages - water, soups as fillers
- Consumption of protein before carbohydrate
- Reducing the quantum of carbohydrate intake
- Whole fruits as dessert

Preservation

- Preservation of grains, for 6-12 months
- Pickling
- Sun drying

Partaking

- Family meals
- Sharing food with guests/visitors

addressed as well. Also, we may still address our food eating behaviors while enjoying the same food without it being harmful to our health. For instance, some studies are advocating for meal sequencing for better metabolic benefits.^{10,11}

REFERENCES

1. Wang W, Hu M, Liu H, Zhang X, Li H, Zhou F, et al. Global Burden of Disease Study 2019 suggests that metabolic risk factors are the leading drivers of the burden of ischemic heart disease. *Cell Metab.* 2021;33(10):1943-56.e2.
2. Cao Y, Huynh Q, Kapoor N, Jeemon P, Mello GT, Oldenburg B, et al. Associations between dietary patterns and cardiometabolic risk factors - A longitudinal analysis among high-risk individuals for diabetes in Kerala, India. *Nutrients.* 2022;14(3):662.
3. Jin SM, Ahn J, Park J, Hur KY, Kim JH, Lee MK. East Asian diet-mimicking diet plan based on the Mediterranean diet and the Dietary Approaches to Stop Hypertension diet in adults with type 2 diabetes: a randomized controlled trial. *J Diabetes Investig.* 2021;12(3):357-64.
4. Mediterranean diet. Available at: <https://ich.unesco.org/en/RL/mediterranean-diet-00884>. Accessed March 29, 2023.
5. Russo GL, Siani A, Fogliano V, Geleijnse JM, Giacco R, Giampaoli S, et al. The Mediterranean diet from past to future: key concepts from the second "Ancel Keys" International Seminar. *Nutr Metab Cardiovasc Dis.* 2021;31(3):717-32.
6. Singh RB, Dubnov G, Niaz MA, Ghosh S, Singh R, Rastogi SS, et al. Effect of an Indo-Mediterranean diet on progression of coronary artery disease in high risk patients (Indo-Mediterranean Diet Heart Study): a randomised single-blind trial. *Lancet.* 2002;360(9344):1455-61.
7. Seethaler B, Nguyen NK, Basrai M, Kiechle M, Walter J, Delzenne NM, et al. Short-chain fatty acids are key mediators of the favorable effects of the Mediterranean diet on intestinal barrier integrity: data from the randomized controlled LIBRE trial. *Am J Clin Nutr.* 2022;116(4):928-42.
8. Kalra S, Kapoor L, Kapoor N. The 3x3x3 diet for the management of diabetes and obesity in resource constrained settings. *J Pak Med Assoc.* 2022;72(4):773-5.
9. Poddar KH, Sikand G, Kalra D, Wong N, Duell PB. Mustard oil and cardiovascular health: Why the controversy? *J Clin Lipidol.* 2022;16(1):13-22.
10. Kubota S, Liu Y, Iizuka K, Kuwata H, Seino Y, Yabe D. A review of recent findings on meal sequence: an attractive dietary approach to prevention and management of type 2 diabetes. *Nutrients.* 2020;12(9):2502.
11. Kapoor N, Sahay R, Kalra S, Bajaj S, Dasgupta A, Shrestha D, et al. Consensus on Medical Nutrition Therapy for Diabetes (CoMeND) in Adults: A South Asian Perspective. *Diabetes Metab Syndr Obes.* 2021;14:1703-28.

Traditional Indian Ocean Diet Working Group

| | |
|-------------------------|--|
| Sanjay Kalra | Dept. of Endocrinology, Bharti Hospital, Karnal, Haryana, India; University Center for Research & Development, Chandigarh University, Mohali, Punjab, India |
| Faraja Chiwanga | Muhimbili National Hospital, Tanzania |
| Syed Abbas Raza | Shaukat Khanum Hospital and Research Center, Lahore, Pakistan |
| Yovan Mahadeb | Victoria Hospital, Ministry of Health and Wellness, Mauritius |
| Noel P Somasundaram | Diabetes and Hormone Center, Colombo, Sri Lanka |
| Fatemeh Esfahanian | Imam Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran |
| Banshi Saboo | Dept. of Endocrinology, DiaCare - Advance Diabetes Care Center, Ahmedabad, India |
| Shilpa Joshi | Dept. of Dietetics, Mumbai Diet and Health Centre, Mumbai, India |
| Shahjada Selim | Dept. of Endocrinology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh |
| Ankia Coetzee | Dept. of Medicine, Division of Endocrinology, Tygerberg Academic Hospital, and Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa |
| Jeyakantha Ratnasingam | Endocrine Unit, Dept. of Medicine, University Malaya, Kuala Lumpur, Malaysia |
| Ketut Suastika | Division of Endocrinology and Metabolism, Dept. of Internal Medicine, Faculty of Medicine, Udayana University, Denpasar, Bali, Indonesia |
| Vivien Lim | Dept. of Endocrinology, Gleneagles Medical Centre, Singapore |
| Khalid Shaikh | Internal Medicine and Diabetes, Royal Oman Police Hospital, Oman |
| Hidayat Ullah Kassim | Medical Residence Hospital Complex Santa Casa de Porto Alegre – Brasil, Provincial Health Directorate Zambezia – Mozambique |
| Sandeep Chaudhary | Consultant Endocrinology, NMC Specialty Hospital, Dubai |
| Kaushik Ramaiya | Shree Hindu Mandal Hospital, Dar es Salaam, Tanzania |
| Chaicharn Deerochanwong | College of Medicine, Rajavithi Hospital, Rangsit University, Thailand |
| Than Than Aye | Diabetes Centre, Grand Hantha International Hospital, Yangon, Myanmar |
| Kirtida Acharya | MP Shah Hospital, National Chair, Diabetes-Kenya |
| Ayuba Issaka | Non-communicable Disease and Implementation Science Unit, Baker Heart and Diabetes Institute, Victoria, Australia |
| Ali Latheef | National Diabetes Centre, Indira Gandhi Memorial Hospital, Maldives |
| Abdirahman Hussein | Dept. of Medicine, Amoud Medical School, Borama, Somalil |
| Nitin Kapoor | Non-communicable Disease and Implementation Science Unit, Baker Heart and Diabetes Institute, Victoria, Australia and Dept. of Endocrinology, Diabetes and Metabolism, Christian Medical College, Vellore, India |

**China Develops its First mRNA COVID Vaccine**

China has approved its indigenously developed mRNA COVID-19 vaccine, according to the CSPC Pharmaceutical Group Ltd increasing its arsenal against future outbreaks. According to the company, the vaccine had significantly lower adverse effects in elderly subjects compared to an adult group. In December last year, China had lifted its zero COVID restrictions and reopened its borders. Since then, the cases have declined... (Source: *Medscape*, March 23, 2023).

Canada Removes COVID Test Requirement for Travelers from China

Canada has joined the list of countries that have removed mandatory COVID testing requirements for travelers from China, Hong Kong and Macao. According to the Health Ministry, this step was taken in view of the improving COVID situation in China... (Source: *Reuters*, March 17, 2023).