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Original Research Article

A study on cooking oil consumption on various health markers in rural population of Coimbatore, India

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Abstract

Background: Refined sunflower oil is the commonly used cooking oil in Indian market. Even though many claims have been put forth regarding its health benefits, an equal number of studies refutes this claim.
Aim: To analyze the health parameters between Sunflower oil users and other traditional cooking oil users.
Methods: 474 patients attending Karpagam Faculty of medical sciences and research hospital were enrolled for the study. History, Examination done and liver enzymes like Alanine transaminase (ALT), Aspartate transaminase (AST) and alkaline phosphatase were done. Results were analyzed using one way ANOVA.
Results: The Body mass index (BMI) and ALT levels of sunflower oil users were significantly higher when compared to that of other oil users.
Conclusion: We found that sunflower oil users have a significant increase in their BMI and ALT levels when compared with that of other traditional oil users
Keywords: Refined sunflower oil, animal fat, BMI, Coimbatore

1. Introduction

Various cooking oils were used in various times of history. The earliest of human beings who lived in Paleolithic era just consumed animals along with their fats with scarce availability of dairy, fruits, vegetables and nuts even though cooking was discovered [1]. Agriculture started just 10,000 years ago where the staple food changed from animal food to plant based cereals and pulses [2]. Even then for many years, animal fats like lard and tallow were used for cooking. The various arrays of vegetable cooking oil started early in last century with introduction of electricity, where the previously used source for lamps such as cotton seed oil lost its galore and entered to the kitchens of humans [3]. Various other vegetable oils like palm, coconut, sunflower, saff flower, rice bran, and canola oils hit the markets with claims of various nutritional benefits, but offered none [4].

In a study, researchers studied the cases of 458 patients who had experienced a coronary event. Of these men, 16 percent who had replaced animal fats with omega-6 polyunsaturated fats found in corn, sunflower and safflower oil died from heart disease. In contrast, only 10 percent of those who did not substitute their fats died as a result of a coronary event [4]. In the modern medical literature, usage of oils and its relation to disease is the one of the most debated issue and it is still going on [5]. A slow but steady shift from vegetable oils to animal fats is taking place widely in the world due to knowledge of inherent health benefits in animal fats over vegetable oils. Such awareness have not entered most of the rural parts of India and most of them still use refined vegetable oils for cooking [6]. The question of high prevalence of Diabetes, Hypertension and Heart disease attributed to vegetable oils is still a mystery to be solved.

The commonly used variety of cooking oil in rural India are refined sunflower oil, Palm oil, Ground nut oil, Sesame oil, Coconut oil and others [7]. Many literature quotes refined Sunflower oil is one of the healthiest and cheapest oils compared with that of other oils [8]. Even though other refined vegetable oils are as harmful as sunflower oil due to its omega 6 fatty acid consumption and oxidation [9] there are not much studies comparing the effects of sunflower oil versus other oil consumers altogether.

Heart is the most important organ of the body in the sense that the commonest cause of death worldwide is attributed to coronary artery disease. So we measured various risk factors for heart disease like Body Mass Index and Blood pressure. Liver is important organ for metabolism and it is the organ of first contact of all food stuffs we eat. Also it

functions to provide fuels to other organs and it overall regulates energy metabolism. So we decided to investigate the potential hazards of oils in damaging liver and heart to find whether there were any differences in health markers between refined sunflower oil (will be mentioned as sunflower oil in this paper) using population and other oils consumers.

2. Methods

This is a cross-sectional observational study conducted between March-April 2015 in Karpagam faculty of medical sciences and research Hospital, Coimbatore, India. Institutional Human Ethical Committee clearance was obtained prior to the study. A total of 474 patients attending OPD for various illnesses were enrolled in the study. Informed consent form was obtained from all participants. The participants were interviewed in detail and their general characteristics like age and sex obtained. Other parameters like Present illness, past illness, their duration, type of cooking oil used, nature of diet like vegetarian or mixed diet. Anthropometric data and Vitals recorded. A medical officer examined the patients and all participants were sent to the laboratory for evaluation of Serum Alanine transaminase, Aspartate Transaminase and Alkaline Phosphatase (ALP). These enzymes are measured using EM ERBA 360 auto analyzer using ERBA reagent system packs which are compatible with the International Federation of Clinical Chemistry. The results obtained were analyzed for one way ANOVA to determine whether there are any significant differences between the means tobacco users versus non users; and for alcohol users versus non users using SPSS 16 software.

3. Results

The general characteristics of the population are given in table 1. The populations under study are of middle aged rural population with more females than males. Most of them consumed mixed diet and the average BMI were normal. The population is divided in to two groups as sunflower oil users and other oil users (Groundnut, Gingelly, Palm, ghee, butter and coconut oil users-refined/unrefined) significance between differences of various parameters in respect to oil use are given in table 2. We found a significant increase in BMI in sunflower oil users with respect to other oil users.

Table 1: General characteristics of the study population

S. No	Parameters	Number
1	Age in years	Mean 57±8
2	Gender	Males-192 females-282
3	Dietary pattern	Vegetarians-51 Mixed diet- 437
4	History of Diabetes	43
5	History of Hypertension	81
6	Systolic BP mmHg	Mean 126±21
7	Diastolic BP mmHg	Mean78±12
8	BMI	Mean24.4±6
9	ALT levels U/L	Mean20±7
10	AST levels U/L	Mean16±6
11	ALP levels U/L	Mean 183±14

Table 2: Means and Comparison of various parameters among sunflower oil users and other oil users using one way ANOVA

Groups/parameters	No	Systolic BP	Diastolic BP	BMI	ALT values	AST values	ALP values
Sunflower oil users	149	128 ±20	80±12	28±5	18±3	15±2	208±59
Other oil users	325	126±22	77±13	23±5	19±8	15±6	185±55
p	-	0.965	0.262	**<0.001**	0.053	0.873	0.385

4. Discussion

Within a span of few decades, a paradigm shift of changing of cooking oils from butter, ghee, unrefined coconut oils, groundnut oil to refined vegetable oils like Sunflowers, Saff flower, Rice bran oils occurred in India with the total consumption of vegetable oils have increased three times than older levels of consumption [10]. Many factors like import liberalization and globalization made many of these varieties of cooking oils made available in India [11]. In the present period, the most commonly used cooking oils in India are Sunflower (64%) followed by Palmolein oil (23%), whereas the traditional oils such as Groundnut (peanut) (7%) and Gingelly (sesame) (2 %) Are less often used [12]. Sunflower oil provides higher polyunsaturated fatty acids (PUFAs) / saturated fatty acids (SFAs) ratio., whereas traditional oils like groundnut oil provide optimal levels of monounsaturated fatty acids (MUFAs 49%), LA (30%) and lower PUFA/SFA ratio [13].

Groundnut and gingelly oils, the popular traditional oils used in southern India, have been largely replaced with

sunflower oil, possibly due to the aggressive commercial advertisements in the 1980s and 1990s promoting their cholesterol-lowering effect[14] and also due to changing lifestyles, increased availability, changes in cost of edible oils, and income levels of rural households [15]. The only one good thing happened during this so called vegetable oil revolution is the wide availability of cheap Palmolein oils through public distribution systems. Palmolein oil with more saturated fatty acid fare better then refined vegetable oils which are used widely now in terms of reducing lifestyle diseases.

In this study, we found that there is a significant increase in Body mass index of sunflower oil consumers when compared to other oil consumers like palmolein, groundnut, coconut and gingelly oil consumers. The findings are very similar to a study conducted in a premier diabetic institution in Chennai [16]. They found that BMI of sunflower oil users were significantly higher than Palm, groundnut and other oil users.

It has been repeatedly proved that the high omega 6 fatty acid to omega 3 fatty acid content in vegetable oils are a greater concern in terms of causation of insulin resistance, hyperlipidemia, obesity and cardiovascular diseases [17]. Saturated and Monounsaturated fatty acids are shunned as causing hyperlipidemia are making inroads in regular diet of many health conscious Indian families. They are better in preventing the above said diseases than other vegetable oils[18].

This study reaffirms that sunflower oil is far inferior in reducing lifestyle diseases like coronary artery disease based on its poor ability to provide a positive role in improving body mass index. It is also seen that unrefined or refined traditional oils like groundnut, sesame, ghee, butter, palmolein and coconut oil users has less BMI than sunflower oil users which may be beneficial for heart since obesity is an independent risk factor for coronary artery disease.

5. Conclusion

It is proved from this study as well as other studies that oils rich in omega 6 fatty acids like sunflower oil increases body fat and may prove detrimental in heart health when compared with other animal fat and other traditional cooking oils used in India.

Limitation

This is a cross sectional study and only reflects the characteristics of only rural population of a specific region. India changes its culture and food habits every 200 kilometres and a wider sampling and a prospective study is needed to provide a clear picture of harmfulness of sunflower oil.

Conflict of Interest: None

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