Short Communication

Iodine number: A new marker for health

Abstract

Correlation of health with the extent of saturation of dietary oils is at best indirect. Our study involved associating the extent of saturation of plasma lipids directly with disease, namely diabetes mellitus. Our aim was to evaluate the significance of the iodine number of plasma lipids in health and disease (diabetes mellitus). A cross-sectional study was conducted in Puducherry involving diabetics and healthy controls. Iodine number was used as the prime variable in this experiment. Iodine number was found to be reduced in the cases (P<0.0005) than in the controls. Iodine number or iodine value has immense potential to be called as a new marker, but further studies are needed to substantiate this claim.

Key words:
Diabetes, iodine number, lipids

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Introduction

The current era of radical chemistry and antioxidants has crafted novel means for the propagation of clinical chemistry, the foundation of which strongly depends on the basic fundamentals. Fusion of historical with futuristic ideals thus becomes highly essential to unlock the secrets of nature.

Iodine number is traditionally used as a basic tool to detect adulterations in various types of oils and other fats. Epidemiological studies[1] tend to associate dietary unsaturated fatty acids with optimum health. These studies have the following shortcomings. First, the data obtained is primarily by interview, without actually quantifying the amount of oil consumed. Second, no deliberate note is made on the extent of processing the oil undergoes before consumption. Third, no note is made of the impact of the unsaturated oils on the extent of saturation of plasma lipids. Hence, the epidemiological data pertaining to the effect of the type of edible oils on health is at best indirect and conjectural.

In the present study, we decided to be more direct in our approach. Instead of dietary lipids, we decided to explore the status of saturation of the plasma lipids directly. We decided to extract the entire lipid fraction of plasma, measure its iodine number and then correlate the values in diabetic patients with normal controls.

Aim and Objective

To compare and analyze the importance of the iodine number of plasma lipids in type 2 diabetes as compared with healthy controls.

Experimental Procedures

Fasting blood samples were collected in anticoagulant tubes from 21 diabetic patients attending the diabetic clinic at A.V. Medical College and Hospital after the appropriate formalities were completed. Control samples were collected from 20 healthy volunteers. Plasma was removed immediately for estimation of various parameters, including iodine number. For estimating iodine number, 250 µl of plasma was taken in a microfuge tube and 500 µl of chloroform was added to it. This was vortexed for 2 min and allowed to stand for 5 min. Then, It was centrifuged for 10 min at 10,000 rpm. The chloroform layer was pipetted out carefully and evaporated in an incubator for 1 h. Iodine number was measured in plasma lipid thus extracted by the standard method.[2]

The standard method involves treating the plasma lipids extracted with iodine monochloride and incubating for 60 min in the dark. Then, potassium iodide releases the iodine, which is then titrated against sodium thiosulfate. We

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standardized the reagent volumes according to the sample volume and, thus, estimated the iodine number.

Other parameters like blood glucose, total cholesterol, triglycerides, total bilirubin, uric acid and albumin were estimated by a Cobas Mira Plus auto analyzer. All results were tabulated with charts and basic statistical methods were employed for data evaluation.

Results

Iodine number of plasma lipids showed statistically significant ($P<0.0005$) low values in diabetics as compared with the healthy controls. Table 1 categorizes different variables measured with appropriate statistics. Physiological antioxidants like total bilirubin ($P<0.05$) and albumin ($P<0.0005$) had significant variations. Moreover, the correlation of iodine number between cases and controls was found to be moderately important ($r=0.31$).

Discussion

Our results tend to indicate the importance of plasma unsaturated fatty acids on health. It is tempting to presume that the beneficial role of unsaturated fatty acids could be by virtue of their ability to quench harmful free radicals.

Table 1: Statistical data of all the variables (in mg/dl) measured, iodine number (g) and standard deviation

n=41	Mean±SD		*P*	*r*
	Cases (21)	Controls (20)	value	value
Glucose	150.85+54.19	95.55+11.25	<0.0005	0.14
Total cholesterol	163.38+44.36	166.7+44.98	>0.5	–0.43
Triglycerides	134.57±78.09	121.25+56.22	>0.5	–0.44
Albumin	4.16+0.29	4.64+0.42	<0.0005	–0.06
Uric acid	5.39+1.69	5.61+1.68	>0.5	–0.11
Total bilirubin	0.55+0.25	0.77+0.43	<0.05	0.17
Iodine number	93.43+24.27	119.85+17.76	<0.0005	0.31

Student's *t*-test for *P*-value; *r*-value for correlation

The present study, however, has the following limitations. First, the sample size is small. Second, data about the intra- and inter-individual variations are limited. Further studies should include a larger sample size and correlation with other disorders.

References

1. The National Health and Nutrition Examination survey. 2001.
2. Plummer DT. An introduction to practical biochemistry, 2nd ed. USA: Tata McGraw-Hill Publishers; 1985. p. 209-11.

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