Research Article

Biochemical Investigation of Bidi Smokers in Rural Areas of Thanjavur District of Tamil Nadu, India

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Abstract: The present study was undertaken to evaluate biochemical changes of bidi smokers in rural areas of Thanjavur district. It was revealed that mean values of Glucose (129.4 ± 11.4 mg/dl), Cholesterol (263.8 ± 8.47 mg/dl), Triglycerides (232.33 ± 2.04 mg/dl), SGOT (59.03 ± 12.8 IU/L), SGPT (51.03 ± 9.34 IU/L), ALP (794.06 ± 20.3 IU/L), Protein (9.3 ± 1.34 gm/dl), were significantly higher in smokers as compared to non-smokers. It may be concluded that smoking produces adverse effects on biochemical profile, therefore increasing the health disease risk.

Keywords: Bidi Smokers, Biochemical Profile, Rural Areas, Thanjavur District

INTRODUCTION

"Bidis" or "beedis" are slim, hand-rolled, unfiltered cigarettes. They are also called "beedis" in countries such as Bangladesh. A bidi consists of about 0.2 gram of sun-dried and processed tobacco flakes, rolled in a tendu leaf (*Diospyros melanoxylon*) or temburni leaf and held together by a cotton thread. The tobacco rolled in bidis is different from that used in cigarettes and is referred to as bidi tobacco [1]. Dark and sun-dried tobacco varieties are used in production [2]. Bidis are available branded and unbranded.

The relatively low combustibility and non-porous nature of the tendu leaves requires more frequent and deeper puffs by the smoker to keep bidis lit, and is therefore harder on the smoker's lungs than cigarettes rolled in paper. Tar levels delivered by bidis are high, at 45-50 mg/bidi. Thus bidis are know as the "poor man's cigarettes", as they are smaller and cheaper than cigarettes [3].

Tobacco smoke is harmful to smokers and to those exposed to tobacco smoke. The chemicals found in bidi smoke are known for their toxicity. Nicotine, the principal pharmacologic agent common to all forms of tobacco, is a powerfully addicting drug . Thus, nicotine in bidi smoke puts smokers at risk for addiction [4].

Nicotine also has an adverse effect on cardiovascular health. Nicotine causes vascular injury and increases heart rate and blood pressure Compared to the smoke of an unfiltered US cigarette, bidi smoke contained more carbon monoxide, ammonia, hydrogen cyanide, phenol, volatile phenols, benzo(a)anthracene, and benzo(a)pyrene. Previous studies indicate that bidis are hazardous to health. Further, the delivery of nicotine in sufficient quantities initiates and sustains dependence, which perpetuates the delivery of toxic

components of smoke to the user [5]. The scope of this project is to explain how smoking alters the biochemical parameters and management.

MATERIALS AND METHODS

The present study was carried out in Biochemical Laboratory of STET women's college Mannargudi. Thirty, fresh and untreated cases of bidi smokers formed the study group. 30 bidi smokers around local area of Thanjavur district were chosen for our study. An equal number of subjects served as control. The subjects were male ranging in age from 40-50 years. All the 30 smokers both non-smokers and smokers, investigated in the present study were regular bidi smokers. All patients were subjected to biochemical investigation.

Collection of Blood

The blood samples were collected in bidi smokers by venous puncture in a heparinised tube. Serum and plasma were separated by centrifugation at 3000 rpm for 15 minutes. The separated plasma serum was used for the investigation. Biochemical parameters were analyzed on semi auto analyzer (Chem- 5 Plus v2 model) using standard kits supplied by Erba. Glucose [6],Cholesterol CHOP-PAP Method [7], Triglycerides GPO-PAP Method [8,] Serum glutamate oxaloacetate transaminase [9], Serum glutamate pyruvate transaminase [10], Alkaline Phosphatase were analyzed by IFCC Method [11] and Total protein by Biuret method

Statistical Analysis:

All the data was expressed in mean ± SD.

RESULTS AND DISCUSSION

In the present study, biochemical changes in bidi smokers and non-smokers were presented in Table I.

This study has analyzed the relationship between lipid peroxidation, enzymes and biochemical changes in smokers with various smoking habits and equal number of age normal. Cigarette smoke contains high concentration of the gaseous compounds, like carbon monoxide (CO) Nitric oxide (NO) and Nitrogen dioxide (NO_2) and other substances in bidis such as aldehydes, hydrogen cyanide, lead, cadmium etc., [12].

Table -1: Biochemical characteristics of smoking effect

S.No	Parameters	Non-Smokers	Smokers
1	Glucose (mg/dl)	97 ± 8.46	129.4 ± 11.4
2	Cholesterol (mg/dl)	169.8 ± 10.4	263.8 ± 8.47
3	Triglyceride (mg/dl)	135.2 ± 10.7	232.33 ± 2.04
4	SGOT (IU/L)	31.23 ± 3.46	59.03 ± 12.8
5	SGPT (IU/L)	33.36 ± 3.81	51.03 ± 9.34
6	ALP (IU/L)	508.6 ± 71.2	794.06 ± 20.3
7	Total Protein (gm/dl)	7.31 ± 2.65	9.3 ± 1.34

Values are expressed as mean ± SD, n=30

Positive relationship between smoking and diabetes has been found in previous studies. Also this relation was found to be dose dependent as persons smoking 10 bidi/day was found to be at higher risk when compared to non-smokers [13], [14] .

In support to these clinical observations, [15] proposed a mechanism to explain the link between smoking and some of the observed changes in serum lipid profile and lipoprotein concentrations.

Nicotine stimulates release of adrenaline by the adrenal cortex, leading to the increased serum concentrations of free fatty acids (FFAs) observed in smokers [16], [17],[18]. Complementary to these mechanisms is the finding free fatty acids (FFAs) also stimulate hepatic synthesis and secretion of cholesterol [19] .

Various mechanism leading to lipid alteration by smoking are (a) Nicotine increased sympathetic adrenal system leading to increased secretion of catecholamine's resulting in increased lipolysis and increased concentration of plasma free fatty acid which further result in increased secretion of hepatic free fatty acid and hepatic triglycerides along with cholesterol in the blood stream (b) Presence of hyperinsulinaemia in smokers leads to increased activity of lipoprotein which leads to increased levels of lipid in smokers [20],[21]. SGOT and SGPT are present in high concentrations in cells of Heart, Liver etc. Bidi smoke propagates the lipid peroxidation, which damage the biological membrane of the liver and heart. The enzymes are leaked out into blood and increased the levels of SGOT in smokers when compared non-smokers [22].

Alkaline Phosphatase is a membrane bound enzyme and is released unequally depending on the pathological phenomenon. Elevation of serum gamma-glutamyltransferase concentration is generally regarded as on of the most sensitive indices of nephrotic damages [23].

The serum protein level is an index of severity and prognosis in hepatic disease. The serum protein levels are usually mildly depressed, in subacute nephrotic necrosis frequently hypo proteinemia [24].

CONCLUSION:

From the results, it may be concluded that bidi smoking produces adverse effect on biochemical profile, therefore increasing the diabetes mellitus, cardiovascular disease, and hypertension and lung cancer risk. Cigarette packs carry a statutory warning about their harmful effects, beedi packs do not have any such warning. Moreover, as the habit of beedi smoking is more common among the economically underprivileged and those with a poor educational status, health education programmes aimed at reducing the smoking habit would be more difficult to implement and would need to be developed especially to cater to these segments of the population.

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