A comparison of adverse effects of tea and coffee between frequent and occasional users.

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Abstract— Tea and coffee are most commonly used social drinks, which are known to produce anorexia anxiety and effect sleep pattern. The present study is designed to compare the effects of tea (which contain caffeine and theophylline) and coffee (which contain caffeine) on sleep, mood and diet. Study involves randomly approached respondents from general public in different areas of Karachi. Peoples (n=500) of age group between 20-60 years were interviewed according to designed questionnaire and information like frequency of drinking tea and coffee and its effects on food intake, sleep pattern and mood were collected. We found that coffee produced significant anorexia, insomnia and anxiety in frequent users compare to frequent users of tea and occasional users of tea and coffee, suggesting that long term intake of coffee may produce anxiogenic and anorexiogenic effects of 5-HT, which is attenuated in tea users.

Index Terms— Tea, coffee, 5HT, anorexia, anxiety, insomnia, frequent user, occasional user.

1 INTRODUCTION

Tea and coffee are the commonly used social drinks, intake is known to increase alertness, work performance, cognition and delay onset of fatigue [1]. Despite these beneficial effects its long term-intake can cause tolerance and dependence [2]. An average cup of coffee contains 100mg of caffeine compare with 50mg for tea [3]. It has been estimated that worldwide caffeine is consumed daily by 80% of individuals and can be considered a substance for potential abuse as long-term use can produce tolerance to beneficial effects but not to adverse effects [4].

The equivalent of one or two cups of coffee (150 to 250 mg of caffeine) is sufficient to induce adverse effects. Excessive caffeine ingestion leads to symptoms that overlap with those of many psychiatric disorders [5].Anxiety and anorexia are the 2 main adverse effects reported in excessive consumer of caffeine [6-9]. Serotonergic system is involved in the regulation of appetite and anxious behavior [10]. Previously, it has been reported that 5-HT-2C receptor agonist produced hypolocomotion, anxiogenesis and hypophagia [11, 12].

This study is designed to compare appetite suppressant and anxiogenic effects of two commonly used social drinks because dietary caffeine is consumed as tea and coffee and is rarely thought of as a problematic drug despite the fact that its intake can leads to psychiatric disorders.

2 METHOD

Detailed Survey involving randomly approached respondents from general public in different areas of Karachi and was conducted for a period of 3 months. A questionnaire was developed through extensive review of published literature. The survey was administered using face to face interview by researchers. Inclusion criteria: All individuals of age group between 20-60 years, whoever consumes tea and coffee both. Data were analyzed by using statistical package for social sciences (SPSS) version 16.The results were summarized by using tables and charts generated by Excel.

3 RESULTS

Some of the main findings of the study are summarized in the table. Total number of participants was 500. About 66% were frequent users and 34% were occasional users.

When participants were asked about questions related to anxiety and anorexia a significant portion of frequent coffee users believes that coffee produce greater anorexia, insomnia and anxiety compared to frequent tea users and occasional users of tea and coffee.

Comparison of Anorexiogenic effects of Coffee and Tea in Frequent and Occasional users

Parameters		Frequent Users %		Occasional Users %	
		Coffee	Tea	Coffee	Tea
Anorexia	Mean	63*	37	28	23
	S.D	3.42	4.1	3.92	3.67

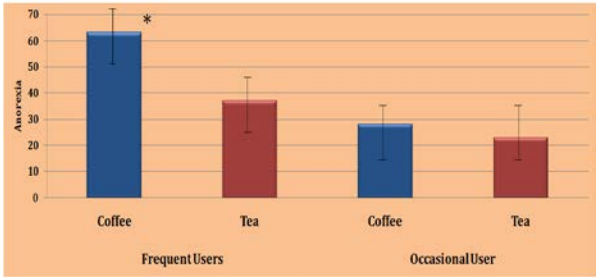

Fig. 1. Shows comparison of anorexiogenic effects in tea and coffee users. P < 0.01 significance in comparison of frequent user of Tea and occasional user of Coffee and Tea

Comparison of Anxiogenic effects of Coffee and Tea in Frequent and Occasional users					
Parameters		Frequent Users %		Occasional Users %	
		Coffee	Tea	Coffee	Tea
Anxiety	Mean	67*	31	22	24
	S.D	2.89	4.7	4.89	4.36

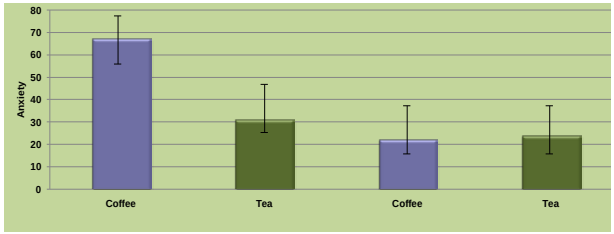

Fig. 2. Shows comparison of anxiogenic effects in tea and coffee users. P < 0.01 significance in comparison of frequent user of Tea and occasional user of Coffee and Tea

Comparison of Insomania effects of Coffee and Tea in Frequent and Occasional users					
Parameters		Frequent Users %		Occasional User %	
		Coffee	Tea	Coffee	Tea
Insomania	Mean	72*	52	60	58
	S.D	8.3	9.7	7.8	6.9

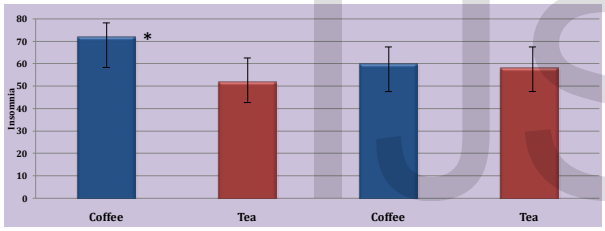

Fig.3. Shows comparison of insomnia in tea and coffee users. P < 0.01 significance in comparison of frequent user of Tea and occasional user of Coffee and Tea

4 DISCUSSION

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Prolong intake of tea and coffee is known to produce anorexia and anxiety [7-9]. The present survey showed that frequent coffee intake can produce more adverse effects on mood, sleep pattern and appetite, compare to frequent intake of tea and occasional intake of tea and coffee.

Tea and coffee which contain caffeine produce stimulation, which is often perceived as desirable, whereas high intake can cause the unpleasant effects [13]. Caffeine use has been linked with specific disorders such as anxiety disorders, sleep disorders and eating disorders, and there is a possible association with schizophrenia [7-9].

The stimulatory effects of caffeine appear to result primarily from blockade of A_{2A} receptors, which stimulate inhibitory GABAergic neurons in pathways to the dopaminergic reward system of the striatum [14]. Symptoms of excessive caffeine consumption are similar to anxiety neurosis [15] and include nervousness, irritability, recurrent headache, twitching and gastrointestinal disturbance among other symptoms [16]. This is a known effect of caffeine. Reimann (1967) noted that symptoms of a psychoneurotic woman disappeared when coffee was reduced [17]. She presented with an irregular fever, insomnia, anorexia and irritability, having consumed large amounts of coffee.

Serotonergic system is involved in the regulation of appetite and anxious behavior [11]. Previously, it has been reported that 5-HT-2C receptor agonist produced hypolocomotion, anxiogenesis and hypophagia [12, 13]. Greater anxiogenic and anorexiogenic response in frequent coffee users suggesting the possibility that long-term caffeine intake may increase the availability of serotonin at $5HT_{2C}$ receptors. The availability of 5HT could be increased due to decreased 5HT catabolism. It has been reported that caffeine consumption inhibit monoamine oxidase activity, an enzyme responsible for intraneuronal 5HT metabolism [18]. It is however also possible that long-term caffeine intake results in desensitization of presynaptic $5HT_{1A}$ receptors results in lack of inhibition of neurotransmitter i.e. 5HT release [7, 11] leads to increase response of serotonin at $5HT_{2C}$ receptor to produce anxiogenic and anorexiognic effects. The present results also tend to show that tea, which contain both caffeine and theophylline produces less adverse effect on appetite and mood, suggesting that theophylline may attenuate $5HT_{2C}$ receptor dependent anorexia and anxiety.

With these findings we see that caffeine present in tea and coffee may cause symptoms of mental illness and is more prevalent than we may imagine. These facts should be brought to the attention of the medical community as well as the public in order that we may have the opportunity of being aware of the possible interactions between ourselves and our environment.

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