Role of Caffeine Intake (Caffenism) in Some Psychiatric Populations

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Abstract

This work was carried out to determine the role of caffeine in amelioration or exacerbation of psychiatric symptomatology and its effect in psychological function of the patients. 200 patients with different psyhiatric diorders; schizophrenics, depressive disorders; bipolar disorders (mania or depressed) and substance abusers. There are two control groups. The 1st group is composed of 20 patients having medical diseases the 2nd group is 20 healthy subjects with no medical complaints. The study revealed that 34.5% of psychiatric patients are high consumers of caffeine, 35% of healthy control group and 30% of the general hospital control. 71% of the patients report increase in attention and concentration and improvement of mood after intake of caffeine. The commonest withdrawal symptoms of caffeine intake in patients were headache 23%, anxiety 19%, urge to drink 17%, drowsiness 14%, boredom 8%, fatigue 5.5%, depressive symptoms 3.5%. From this work we can conclude that caffeine intake in moderate use has an ameliorating effect on mood, attention, concentration and headache, but caffenism also can produce some withdrawal symptoms.

Introduction

Caffeine is the most widely consumed psychoactive agent in the world (Rall, 1980), ingested by millions of people, in multitudes of forms, often in large quantities (Gilbert, 1984). Many beverages contain caffeine such as tea, cola, coffee. **A** cup of tea contains as much as 50mg caffeine while a cup of coffee contains as much as 150 mg caffeine (Kaplan et al., 1994).

The DSM IV 1994 has provisions for the diagnosis of caffeine intoxication, caffeine induced anxiety disorder, caffeine induced sleep disorders and gives research criteria for caffeine withdrawal. Caffeinism is included in ICD10 under the diagnosis of F15-Mental and behavioural disorder due to use of other stimulants including caffeine.

It large quantities of caffeine (exceeding 250 mg/day are ingested acutly by a novice user without tolearance, acute and discomforting clinical manifestation can be anticipated (Peters, 1967).

The clinical feature of caffeinisim tends to develop insidiously, only after months or years of intake, sometimes because there has been a gradual increase in daily intake, sometimes because of CNS changes associated with chronic use, or sometimes because of biological changes associated with aging.

Most patients diagnosed as having caffeinism are older than 35 years, perhaps because of the insidious nature of symptom development, and despite wide spread educational efforts, the majority of subjects with caffeinsim still fail to associate the development of symptoms with their long standing ingestion of caffeine. Few people-perhaps so few that case reports would be warranted-seek medical help for "caffeinism". Instead, they present with other complaints (Greden, 1974).

As regards the neuropharmacological actions of caffeine, it was found that it most probably has the following effects;

significant increase in neorepineplrine excretion, inhibit phosphodiesterase breakdown of cyclic AMP, sensitize central catecholomine in post synaptic receptors, modulates acetyl choline and serotonin, modify calcium metabolism, and antagnoize central nervous system adenosine receptors and this antagonism of adenosine receptors may account for many, not all, of caffeine's behavioural effects (Snyder, 1984).

Among the clincial manifestation of caffeinism are the anxiety features which may be indistinguishable from the clinical symptoms in patients with generalizeed anxiety disorder (Greden, 1974).

Somatic manifestations such as diuresis, headache, tachycardia, arrhythmnias, tremulousness are the most common reasons for people with caffeinism to seek treatment in primary care medical settings (Victor et al., 1981).

Patients with affective disorders reported greatest intake of caffeine as it makes them "less depressed" suggesting that certain depressed patients may be self-medicating with caffeine (Greden, 1978).

As regards psychotic patients, caffeine has been noted to accentuate psychotic thinking and possibly to induce psychotic relapse (Miliksen, 1978).

Subjects and Methods

Subjects

200 patients with differents psychiatric disorders; schizophrenics, depressive disorder, biplor disorders and substance abusers constitute patients admitted to the Institute of Psychiatry, Ain Shams University. The diagnosis was based on the criteria of DSM IV.

There are 2 control groups; the 1st group is composed of 20 patients having other medical diseases, and the 2nd control group containing 20 healthy subjects with no medical complains.

Aim of the work

1- To determine the role of caffeine intake in amelioration or exacerbation of psychiatric symptomatology.

2- Determination of the effect of caffeine intake on the psychological functionning of patients.

Methods

1- The tool

The tool used was a semistructured interview specially designed containing items related to substance use of caffeine, and its amount. The interview includes also effects of caffeine intake on psychiatric symptomatology (by either exacerbation or amelioration) and manifestations of caffeine intoxications and witdrawal according to DSM IV criteria.

2- *Statistical analysis.*

Statistical analysis was done using IBM compatable. PC. SPSSWIN program, V: 6 :1 release 1994.

Results

As shown in table (1) all psychiatric diagnoses are mostly moderate and high consumers of caffeine. 48% of sclizophrenics were moderate consumers and 30% high consumers, 40% of depressives are moderate consumers and 32% high consumers, 52.8% of bipolar (manic) are moderate consumers and 30.6% high consumers and 33.3% of substance abusers are moderate consumers of caffeine and 57.6 are high consumers.

As regards caffeine effect on attention and concentration (table 2) it was founed that it increases attention and concentration in 71% of cases, 6.5% of them mild consumers, 35% of them moderate consumers and 29% of them high consumers.

29% of cases showed no effect on attention and concentration. The difference between

"yes" and "no" effect was found statistically significant.

As regards its effect on mood (table 3), it was found that caffeine intake improves mood in 71% of cases, 8% of them mild consumers, 35% of them moderate consumers and 28% of them high consumers. 42.5% of schizophrenics report increase in mood, 56% of depressives, 69.4% of bipolar manic and 78% of substance abusers.

The correlation between the diagrnosis and psychiatric symptomatology (table 4) showed that 4.9% of schizophrenic was exacerbated and 22.5% was ameliorated, also 4% of depressives were exacerbated and 40% were ameliorated.

Regarding the comparison between patients group and the other two control gorups regarding the effect of caffeine on attention, concentration and mood, this comparison was found statistically insignificant (chi square value = 0.0088, DF = 19).

Comparing the patients group and control group regarding the causes of intake of caffeine, table *(5)* shows that there was a statistically significant difference on all variables except for alleviation of anxiety and stimulation, which were found to be statisitically insignificant.

Also, in table (6), comparison between patients and control groups regarding the toxic manifestations of caffeine showed no statistical significance.

As regards the comparison of withdrawal symptoms of chronic caffeine intake, between patient group and the control gorups, again there was no statistical significance. as shown in table (7).

	schizoph-renics		**Depressive disorders**		**Bipolar manic**		**Bipolar depressive**		**Substance abuse**	
	No.	*%*	**No.**	*%*	**No.**	*%*	**No.**	*%*	**No.**	*%*
Mild	022	21.6	07	028	06	16.7	1	025	03	09.1
Moderate	049	048	10	040	19	52.8	3	075	11	33.3
High	031	030	08	032	11	30.6	-	-	19	57.6
Total	102	100	25	100	*36*	100	4	100	***33***	100

	Increase attention concentration		**No effect**		**Total**		Chi square value
	No.	%	**No.**	*%*	**No.**	*%*	
Mild	013	06.5	26	013	039	19.5	value = 34.29
Moderate	071	35.5	21	10.5	092	046	DF = 2
High	058	029	11	05.5	069	34.5	P<0.001 Significant
Total	142	071	58	029	200	100	

Table (3)
Effect of consumption of caffeine (high, moderate,mild) on subjective sense of increased mood.

	Improve mood (euphoria)		No effect		Chi square value
	No.	%	No.	%	
Mild intake	016	08	23	11.5	value = 24.54
Moderate intake	070	35	22	011	DF = 4
High intake	056	28	13	06.5	P<0.001 Significant
Total	147	71	58	029	

Table **(4)**
Correlation between diagnosis and psychiatric symptomatology.

	Exacerbation		Amelioration		No effect		Total		Chi square value
	No.	*%*	**No.**	*%*	**No.**	*%*	**No.**	*%*	
Schizophrenia	5	4.9	23	22.5	74	72.5	102	100	value =13.6
Depressive Dis.	1	04	10	040	14	56	025	100	DF = 8
Bipolar (manic)	2	5.6	05	13.6	29	80.6	036	100	P<0.05
Bipolar(depressive)	-	-	01	25	03	75	004	100	insignificant
Substance abuse	5	15.2	03	9.1	25	75.8	033	100	

Table ***(5)***
Comparison between patient group and control group regarding causes of intake of caffiene.

	Psychiatric patients		Healthy control		Chi square value	
	No.	*%*	**No.**	*%*		
I like taste	72	36	07	35	¥value =.0079	DF =1
To alleviate anxiety	17	8.5	02	10	value =1.842 +	DF =1
To alleviate sadness	02	01	01	*05*	value = 0.20183 *	DF =1
Improve mood	43	21.5	05	25	¥value = 0.1305	DF =1
Habit (family beverage)	91	45.5	10	50	¥value = 0.14827	DF =1
With cigarette	10	05	02	10	¥value = 0.8814	DF =1
Stimulant	50	25	12	60	value = 11.0044 +	DF =1
Digestive	17	8.5	02	10	¥value = *05*185	DF =1
To releif headache	16	08	02	10	¥value = 0968	DF =1
To alleviate side effect of drugs	06	03			¥value = 0.61682	DF =1

Table (6)
Comparison between patient group and control group regarding toxic effect of caffiene.

	Psychiatric patients		General Hospital		Chi square value
	No.	%	No.	%	
Restlessness and nervousness	55	27.5	5	25	¥value =0.0572 DF =1
Excitment	27	13.5	4	20	¥value =3.0777 DF =1
Insomnia	71	35.5	7	35	¥value = 0.00199 DF =1
Diuresis	31	15.5	5	25	¥value = 1.198 DF =1
Tachycardia	20	010	1	5	¥value = 2.20 DF =1
Muscle twitching	11	5.5			¥value = 1.157 DF =1
GIT disturbance	01	0.5			¥value = 0.10046 DF =1

Table (7)
Comparison between patient group and general hospital control regarding withdrawal symptoms of caffiene.

	Psychiatric patients		General Hospital		Chi square value
	No.	%	No.	%	
Headache	45	23	04	20	¥value = 0.09318 DF =1
Fatigue	11	5.5	01	05	¥value = 0.0088 DF =1
Anxiety	38	19	06	30	¥value = 1.375 DF =1
Drowsiness	28	14	06	30	¥value = 3.5623 DF =1
Depression	07	3.5			¥value = 0.72300 DF =1
Nausea & Vomiting	04	02			¥value =0.4741 DF =1
Boredom	16	08	02	10	¥value =0.0968 DF =1
Urge to drink	33	16.5	04	20	value =0. 15421 DF =1

In Tables 5,6 and7.
*** = P > 0.05 insignificant**
+ = P< 0.05 significant

Discussion

Gerden (1978) said that caffeine doses exceeding 250 mg/day are considered pharmacologically large. An intake of this magnitude predisposes to caffeinism and among hospitalized psychiatric patients, more than 20% reported caffeine consumption exceeding 750 mg/day from all sources. These data are consistent with our result in that 34.5% of the patients are high consumers of caffeine (consume more than 250 mg/day). Of them 30% are sclizophrenics, 32% depressives, 30.6% bipolar manic, and 57.6% substance abuses. The comparison between the patients group and controls was found statistally insignificant. But these are not consistent with those compiled by Winstead (1976) that caffeinism may be more prevalent among hospitalized patients than among non hospitalized.

71% of the patients report increase in attention and concentration after intake of caffeine and the comparison between patients and controls was found statistically insignificant and these results are consistant with the known pharmacological property of caffeine as CNS stimulant, mainly by competitive antagonism of the adenosine receptors (Synder, 1984).

Seventy one per cent of the patients reported improvement in mood after intake of caffeine, and the comparison between the patients group and the controls was found statistically insignificant. These results are consistant with Kaplan et al., (1994) that ingestion of caffeine in moderate dosage (100 - 200 mg) induce common symptoms including increased alertness and a mild sense of well being.

Three per cent of potients (of them 1% of schizophrenics) take caffeine to alleviate the side effects of drugs (moderate and high consumers). Kaplan et al., 1989, explained that both coffee and tea have been reported to form an insoluble precipitate with a variety of antipsychotic drugs, possibly interfering with drug absorption. Caffeine also has been suggested to enhance the breakdown of neuroleptic drugs in the hepatic microsomal enzyme system. Although there is no universal agreement about such effects, drug-drug interactions are potentially important and suggest that caffeine products should be used minimally in pateints receiving antipsychotic medications.

Kaplan et al. (1994) postulated that caffeine intake is associated with an exacerbation of psychotic symptoms in schizophrenic patients and this goes with our results in that 4.9% of schizophrenics report exacerbation of symptoms while 22.4% of schizophrenics report amelioration of symptoms and this may be the role of caffeine in alleviating the side effects of antipsychotics in schizophrenic patients under therapy.

The commonest toxic symptoms of caffeine intake in patients were restlessness and nervousness 29.8%, excitement 13.5% insomnia 35.5%, diuresis 25%, and tachycardia 5%. The comparison between the patients and the control group regarding caffeine intoxication was found statistically insignificant and our result are in agreement with that of Bernstein (1994).

Hughes (1991) stated that some coffee drinkers exhibit signs of caffeine dependence i.e. they self administer coffee for the effects of caffeine, have withdrawal symptoms on cessation and experience adverse effects. Also Strain et al. (1994) mentioned that it is valuable to recognize caffeine dependence as a clinical syndrome, since some people feel compelled to continue caffeine use, despite desire and recomendation to the contrary. The results of Hughes et al. (1991) and Strain et al., (1994), also are in agreement with our results.

Finally, caffeine containing beverages are

domesticated, popular, and widely consumed. It will cotinue to be a component of our society. Safe use is certainly possible, it continues to be the norm for most people. However, caffeinism and caffeine withdrawal also continue to be common and clinically important, but they are underdiagnosed or ignored in many treatment settings. Research on caffeine's neurophormacologic consequences has to be flourished. More knowledge is needed so, we can conclude that caffeine intake in moderate use has an ameliorating effect on mood, attention, concentration and headache, but caffeinism also can also produce some withdrawal symptoms.

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تأثير الكافيين على المرضى النفسيين

اتجه هذا البحث لاظهار العلاقة بين استعمال الكافيين و اعراض الامراض النفسية و العقلية. و لقد قام البحث على مائتى حالة من المرضى المصابين بالفصام و الاكتئاب و الاضطرابات الوجدانية الثنائية و المدمنين و قد ضبط البحث بعينتين ضابطتين الاولى عدد من المرضى الباطنيين (٢٠) حالة و الثانية من الاصحاء (٢٠) حالة .

اكدت النتائج ان ٣٤,٥٪ من المرضى النفسيين وان ٣٥٪ من المرضى الباطنيين يستعملون الكافيين بكثرة. كذلك وجد ان هناك تحسن واضح فى الانتباه و التركيز و تحسن فى الحالة الوجدانية بعد استعمال الكافيين(٧٠٪) .

من البحث تبين ان هناك اعراض انسحابية عند التوقف عن استعمال الكافيين تتمثل فى صداع (٢٣٪) قلق (١٩٪) رغبة فى الشرب (١٧٪) دوخة (١٤٪) زهق (٨٪) تعب (٥,٥٪) اكتئاب (٣,٥٪).

من هذا البحث نجد ان الاستعمال المعقول للكافيين يؤدى الى تحسن فى الوجدان و الانتباه و التركيز و الزيادة فى استعماله تؤدى الى اعراض جانبية.