Journal of Psychiatry

OPEN ACCESS Freely available online

Research Article

Effects of Selected Psychotropic Drugs on the Cardio-Respiratory Fitness and Body Composition of Patients with Serious Mental Illness in South East Nigeria

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ABSTRACT

Weight-gain in psychiatric population is a common clinical challenge. The purpose of this study was to determine the effect of selected psychotropic drugs on the cardio-respiratory fitness and body composition of patients with serious mental illness (SMI).Forty four subjects (22 SMI and 22 apparently healthy subjects as control) participated in this quasi-experimental study, which were selected using purposive and consecutive sampling respectively. The VO2max was estimated from HR recovery (HRrec) after 15 seconds using the equation VO2max=111.33-0.42H for males and 65.81-0.1847H for females. Comparative analysis of the data was done using descriptive statistics of mean and standard deviation, the inferential statistics of independent t-test with alpha level of significance of 0.05. Significant differences were recorded between the VO2max of SMI as 53.72ml/kg/min and apparently healthy subjects as 64.44ml/kg/min. The sum of skin fold thick was seen to be 46.41+32.87mm for SMIs and 28.50+9.49mm for apparently healthy subjects. Patients with severe mental disorder had significantly lower VO2max and higher body composition than the apparently healthy psychotropic naïve subjects. Thus, it is critical that clinicians take precautions to monitor and control weight-gain.

Keywords: Serious Mental Illness; VO2max; Psychotropic drugs; Psychiatry; Obesity

BACKGROUND OF THE STUDY

Severe Mental Disorder (S.M.D) or Serious mental illness is defined as a clinically significant psychological or behavioral syndrome that causes significant (subjective) distress, (objective) disability, or loss of freedom; and which is not merely a socially deviant behavior or an expected response to a stressful life event (e.g. loss of a loved one) (DSM, 2000).A severe mental disorder should be a manifestation of behavioral, psychological, and/or biological dysfunction in that person (DSM, 2000). Patients with psychiatric disorder are known as psychiatric patients.

Depression is a mental disorder characterized by a pervasive and persistent low mood that is accompanied by low self-esteem and by loss of interest or pleasure in normally enjoyable activities.

A depressed people may be preoccupied with, or ruminate over, thoughts and feelings of worthlessness, inappropriate guilt or regret, helplessness, hopelessness, and self- hearted. Its impact on functioning and well-being has been compared to that of chronic medical condition such as diabetes [1].

Appetite often decreases, with resulting weight loss, although increased appetite and weight gain occasionally occur. A rational corollary would be that, all psychiatric disorders are due to abnormal brain functioning and are therefore organic [2].

Anti-depressants are psychotropic drugs given to patients with depressive disorder to alleviate symptoms. They correct chemical imbalances of neurotransmitters in the brain which probably cause changes in mood and behavior. These medications are classified as Monoamine Oxidase Inhibitors, MAOIs, (eg phenelzine and also isocarboxazide), Noradrenaline and Specific Serotonergic Antidepressants, NASSAs, (eg Mianserin and mirtazapine), Serotonin and Noradrenaline Re-uptake Inhibitors, SNRIs, (eg Venlafaxine and duloxetine), Selective Serotonergic Re-uptake Inhibitors, SSRIs, (eg Sertraline, paroxetine and Citalopram), Tricyclic Antidepressants,TCAs, (eg amitriptyline, amoxapine-clompramine and imipramine).

Cardiorespiratory fitness refers to the ability of the circulatory and respiratory systems to supply oxygen to skeletal muscle to

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Received: February 21, 2020; **Accepted:** August 17, 2020; **Published:** September 07, 2020

Citation: Ibikunle PO, Orovwigho A, Oguaghamba CI, Awhen P (2020) Effects of Selected Psychotropic Drugs on the Cardio-Respiratory Fitness and Body Composition of Patients with Serious Mental Illness in South East Nigeria. J Psychiatry 23:474. doi: 10.35248/2378-5756.20.23.474

sustain physical activity. Exercise improves the respiratory system by increasing the amount of oxygen that is inhaled and distributed to body tissue [3]. Cardiorespiratory fitness can reduce the risk of heart disease, lung cancer, type 2 diabetes, stroke, and other diseases. Cardiorespiratory fitness helps improve lung and heart condition and increases feelings of well-being [3]. Depressed and anxious individuals exhibit a less active life-style and have a reduced cardiorespiratory fitness in comparison with the general population [4].

Maximum oxygen uptake (VO2max) is defined as the highest rate at which oxygen can be taken up and utilized by the body during severe exercise [5]. It is one of the main variables in the field of exercise physiology and is frequently used to indicate the cardiorespiratory fitness of an individual [5]. Therefore, it is a major measure that indicates the functional capacity of the cardiorespiratory system [6]. In the scientific literature, an increase in VO2max is the most common method of demonstrating a training effect and so it is frequently used in the development of an exercise prescription [5].

The current concept of VO2max began with the work of [7] where he defined the maximum oxygen uptake and stated that there is a linearly related relationship between workload and oxygen consumption. He went ahead to show that as exercise intensity increases, oxygen consumption increases proportionally. However, there comes a point at which the oxygen consumption ceases to rise. This is referred to as the maximal oxygen uptake (VO2max). Step test (Chester step test) is one of the most widely used field tests for estimating VO2max [8].

Psychotropic agents, including antipsychotic medication and antidepressants have been found to be associated with substantial weight-gain. This weight gain is troublesome as it increases an individual's risk of diabetes and cardiovascular disease [9]. A normal body mass index (BMI) is considered to be between 18.5 and 24.9, a BMI between 25 and 29.9 is classified as overweight, and 30 to 39.9 denotes obesity. Patients with a BMI above 40 are considered extremely obese [10].

Studies have found that antidepressants lead to an increase of weight in anywhere between 24-100% of patients, with an average weight-gain of 0.57 to 1.37kg per month of treatment [11,12]. Lithium carbonate therapy is also associated with significant weight-gain with some studies reporting a gain of over 10kg in 20% of patients [13,14]. A recent study looked at antipsychotic-induced weight-gain in a pediatric sample and noted marked and rapid weight-gain [15], children and adolescents are known to be at a higher risk for weight-gain associated with antipsychotic treatment [16]. It should be noted that not all psychotropic drugs lead to weight-gain, and some have been shown to decrease weight such as serotonin re-uptake inhibitor (SSRI) during the first few weeks of use [17], felbamate [18], and topiramate [19].

Body composition is used to describe the percentages of fat, bone, water and muscle in human body. Because muscular tissue takes up less space in our body than fat tissue, our body composition, as well as our weight, determines leanness. Two people of equal height and body weight may look completely different from each other because they have a different body composition. Sum of skin fold thickness, fat-free mass, body surface area make up the body composition.

The psychotropic that will be considered in this study include only anti-depressants and anti-psychotic drugs. New theories of the mechanism underlying antipsychotic associated weight-gain focus on the effect of antipsychotics on peptide hormonal regulators of metabolic control, including leptin, ghrelin, and adiponectin [9,20] found that the weight-gain associated with medication was directly related to changes in leptin signaling. However, long-term studies on ghrelin showed increased levels in patients on typical antipsychotics that typically produce weight-gain. Thus, it appears that ghrelin, and possibly other peptide hormones, may be useful predictors of weight-gain in patient who are receiving antipsychotic treatment [20]. Tricyclic anti-depressant has been shown to increase appetite and carbohydrate craving [12]. Additionally, decreased energy expenditure may contribute to weight gain.

In the case of Lithium carbonate therapy, research has shown an insulin-like effect on carbohydrate metabolism, altered fat cell metabolism, and depressed thyroid function [21,12].

Weight-gain in psychiatric populations is a common clinical challenge. Many patients suffering from psychiatric disorder, when exposed to psychotropic medications, gain significant weight with or without other side effects [9]. A sub-optimal level of cardio respiratory fitness is a risk factor for coronary heart disease and other chronic diseases among adults, such as colorectal cancer, type II diabetes, depression, and is associated with all cause of mortality [22]. Olanzapine-induce weight-gain is associated with increased adiposity which in turn increases risk of developing metabolic syndrome, including cardiovascular disease and impaired glucose tolerance leading to the risk of developing diabetes type II.

There are few published data on effect of psychotropic drugs on cardio-respiratory and adiposity profile of SMI patients from Nigeria, although there are some published report from America and Asia. Much research has not been conducted on the effect of Antidepressants and Antipsychotic drugs on the cardiorespiratory fitness and body composition of psychiatric patients and probably none in Southeast Nigeria. The aim of this study therefore, was to determine the effect of selected psychotropic drugs on the VO2max values and body composition of young patients with serious mental illness.

METHOD

Quasi-experimental research design was used in the study. This study was conducted in Federal Neuropsychiatric Hospital Enugu, Enugu State, Nigeria and Nnamdi Azikiwe University Campus, Nnewi; Anambra State, Nigeria. Two groups were involved: Group A and B.

Group A: Twenty two patients with serious mental illness (13 males and 9 females) between the ages of 18 and 35 years old on the selected psychotropic drugs for not less than two months participated in the study. The age of each subject was calculated from the date of birth that was recorded in the patient's folder to the last birthday. They were recruited using purposive sampling technique.

Group B**:** Twenty two apparently healthy individual (13 male and 9 female), between the ages of 18 and 35 years old participated in the study. They were recruited using consecutive sampling technique

Procedure for data collection

Ethical approval was obtained from the ethical committee of Federal Neuropsychiatric Hospital, Enugu, Enugu State. Also, the inform consent of the participants was sought and obtained. The participants in Group A were carefully selected in the in-patient department of Federal Neuropsychiatric Hospital using their folders, with their names, hospital numbers, phone numbers, the drugs they are taking if they are within the range of Clozapine, Olanzapine, Resperidone and Phenelzine, Mianserin which are

classified as atypical anti-psychotic drugs and anti-depressants in this environment respectively and the dosage range was documented. The 22 participants were divided into four groups of five (5) participants each for the first, second, third and fourth day and seven (7) participants for the fifth day respectively. All the participants were familiarized with the Chester Step and the Heart Rate Monitor. The details of the study were explained to each of the prospective participants and their consent obtained. On arrival the participants were allowed to rest for 5 minutes after which the resting blood pressure and resting heart rate were taken in a sitting position. The testing and measurement procedures as well as derivation formulae are as follows:

Bio-data: Participants were observed for their gender while information concerning the ages was obtained from the folders. The age was recorded to the last birthday.

Blood pressure: This was measured using the electronic blood pressure monitor while the participants sat in a comfortable position.

Height (m): This was measured using a height meter with the subject bare-footed and erect on the platform and measurement was taken at the level of the vertex.

Weight (kg): This was measured using a portable bathroom weighing scale. The participants were measured bare-footed and with minimal clothing.

Body Mass Index (kg/m^2): This was calculated using the following formula.

BMI= (Body mass in kg)/ (Stature in m^2).

Body Surface Area (m^2): This was calculated using.

BSA= (Body mass in kg)$^{0.425}$ X (Body height in m) $^{0.725}$ X 0.007184.

Skin fold thickness measurement: This was measured by slim guide skin fold caliper. This measurement was taken on the following four sites: the biceps, the triceps, the sub scapular, the suprailiac.

Sum of skin fold thickness: This was calculated using

Sum of skin fold thickness (mm) = bicep + tricep + sub scapular + suprailiac.

Percentage Body Fat: This was estimated from sum of skin folds. It is calculated using equations of Siriand Dumin & Womersley. The regression equations for the prediction of body density from the log of the sum of skin fold thickness at four sites in mm are as follows.

For 20 to 29 years age group:

Body Density (gm/cc) = 1.1631 – 0.0632(X).

Where

X = log (biceps + triceps + subscapular + suprailiac).

Percent body fat = (4.95/Body density – 4.5) X 100.

Total body fat (kg) = (%body fat/100) X Body mass (kg).

Lean body mass (kg) = Body mass (kg) – Total body fat (kg).

VO2max Testing Procedure

Chester Step Test (CST) requires the subject to step on to and off a low step at a rate set by a metronome. On arrival at the research venue, the participants were allowed to rest for at least 5 minutes after which their resting blood pressure and heart rate were taken. Then the metronome was set at 96 beats per minute for male with a stepping rate of 24 steps per minute and 88 beats per minute for female with a stepping rate of 22 steps per minute. The participants continue this for 3 minutes or get down when tired. At the end, the blood pressure was measured and the recovery heart rate was recorded after 15 seconds.

Aerobic capacity and fitness rate was then estimated using the recovery heart rate after 15 seconds. Using the equation VO2max = 111.33 – (0.42 X HRrec) for male and VO2max = 65.81 – (0.1847HRrec) for female developed by [23] for step bench estimation of maximum oxygen uptake where HRrec is the 15 seconds recovery heart rate.

Treatment of data

The data obtained from this study was summarized using descriptive statistics of mean and standard deviation, the inferential statistics of independent t-test with the level of significance set at 0.05 was used to analyze the data.

RESULTS AND DISCUSSION

Participants Profile

A total of 44 participants were involved in this study which include 22 patients (13 males and 9 females) with severe mental disorder on psychotropic drugs and 22 apparently healthy psychotropic naïve subjects (13 males and 9 females). Table 1 and table 2 show the mean and standard deviations of the anthropometric variables of participants.

Estimated VO_2 max, body surface area, sum of skin fold thickness, free fat mass and body mass index for patients with serious mental illness and apparently healthy subjects. [Table 1]

As shown in table 1, the VO_2 max of patients with severe mental disorder (53.721±2.323 ml/kg/min) was significantly lower (P=0.01) than that of apparently healthy subjects (64.439±3.235 ml/kg/min) (P=0.01), with the average body surface area of patients with severe mental disorder as 0.041±0.00063m^2 and the average body surface of apparently healthy subjects as 0.039±0.00063m^2. The sum of Skinfold thickness on average was 46.409±7.007mm for patients with serious mental illness and 28.500±2.022mm for apparently healthy subjects. The fat free mass for patients with serious mental illness was 19.759±0.691kg, and 19.104±0.303 for apparently healthy subjects, and the average body mass index was 23.997±1.258kg/m^2 for patients with severe mental disorder and 21.568±0.305kg/m^2 for apparently healthy subjects.

[Table 2]

Table 2 shows the comparison between parameters of male Patients with severe mental illness and their apparently healthy male counterparts. Results showed that patients with SMI had significantly lower Vo_2 Max(t=-5.264; p=0.000) but thicker skin folds (t=2.44; p=0.024) than their apparently healthy male counterparts.

Table 1: Overall VO_2 max, Body surface area, sum of skin fold thickness, fat-free mass, Body mass index for patients with serious mental illness and apparently healthy subjects.

		N	Mean	Standard deviation	t-value	p-value
VO2max (ml/kg/min)	Patients with severe mental disorder	22	53. 721	10.895	-2.691	0.010
	Apparently healthy subjects	22	64.439	15.172		
Body Surface Area (m^2)	Patients with severe mental disorder	22	0.041	0.003	2.049	0.047
	Apparently healthy subjects	22	0.039	0.003		
Sum of skin fold thickness (mm)	Patients with severe mental disorder	22	46.409	32.867	2.456	0.018
	Apparently healthy subjects	22	28.500	9.486		
Fat-free mass (kg)	Patients with severe mental disorder	22	19.759	3.240	0.868	0.390
	Apparently healthy subjects	22	19.104	1.419		
Body mass index (kg/m^2)	Patients with severe mental disorder	22	23.997	5.901	1.876	0.068
	Apparently healthy subjects	22	21.568	1.431		

Table 2: VO_2max, body surface area, sum of skin fold thickness, fat-free mass, and body mass index for male patients with serious mental illness and male apparently healthy subjects.

		N	Mean	Standard Deviation	t-value	p-value
VO_2max (ml/kg/min)	Male patients with serious mental illness	13	59.702	10.343	-5.264	0.000
	Male apparently healthy subjects	13	76.373	4.841		
Body surface area (m^2)	Male patients with serious mental illness	13	0.040	0.000	1.000	0.327
	Male apparently healthy subjects	13	0.0392	0.028		
Sum of skin fold thickness (mm)	Male patients with serious mental illness	13	28.154	8.649	2.414	0.024
	Male apparently healthy subjects	13	22.154			
Fat-free mass kg)	Male patients with serious mental illness	13	19.262	1.837	-0.660	0.516
	Male apparently healthy subject	13	19.698	1.512		
Body mass Index(kg/m^2)	Male patients with serious mental illness	13	22.035	2.675	0.438	0.666
	Male apparently healthy subjects	13	21.650	1.711		

Table 3: VO_2max, body surface area, sum of skin fold thickness, fat-free mass, body mass index for female patients with severe mental disorder and female apparently healthy subjects.

		N	Mean	Standard Deviation	t-value	p-value
VO_2max (kg/ml/min)	Female patients with serious mental illness	9	45.082	3.002	-1.809	0.089
	Female apparently healthy subjects	9	47.200	1.822		
Body surface area (gm/cc)	Female patients with serious mental illness	9	0.0422	0.0044	1.809	0.089
	Female apparently healthy subjects	9	0.0389	0.0033		
Sum of skin fold thickness (mm)	Female patients with serious mental illness	9	72.778	37.412	2.749	0.014
	Female apparently healthy subjects	9	37.667	8.246		
Fat-free mass kg)	Female patients with serious mental illness	9	20.476	4.639	1.427	0.173
	Female apparently healthy subjects	9	18.246	0.678		
Body mass Index(kg/m^2)	Female patients with serious mental illness	9	26.830	8.0869	1.982	0.065
	Female apparently healthy subjects	9				

Table 4: VO_2max, body surface area, sum of skin fold thickness, fat-free mass, and body mass index for male and female patients with serious mental illness.

		N	**Mean**	**Standard Deviation**	**t-value**	**p-value**
VO_2max (ml/kg/min)	Male patients with serious mental illness	13	59.702	10.343	4.095	0.001
	Female patients with serious mental illness	9	45.082	3.002		
Body surface area (m^2)	Male patients with serious mental illness	13	0.040	0.000	-1.838	0.081
	Female patients with serious mental illness	9	0.042	0.004		
Sum of skin Fold thickness (mm)	Male patients with serious mental illness	13	28.154	8.649	-4.185	0.000
	Female patients with serious mental illness	9	72.778	37.412		
Fat-free mass kg)	Male patients with serious mental illness	13	19.262	1.837	-0.858	0.401
	Female patients with serious mental illness	9	20.476	4.369		
Body mass Index(kg/m^2)	Male patients with serious mental illness	13	22.035	2.675	-2.004	0.059
	Female patients with serious mental illness	9	26.83	8.087		

Table 5: VO_2max, body surface area, sum of skin fold thickness, fat free mass and body mass index for male and female apparently healthy subjects

		N	Mean	Standard Deviation	t-value	p-value
VO_2max (ml/kg/min)	Male apparently healthy subjects	13	76.373	4.841	17.150	0.000
	Female apparently healthy subjects	9	47.200	1.822		
Body surface area (m^2)	Male apparently healthy subjects	13	0.039	0.0027	0.262	0.796
	Female apparently healthy subjects	9	0.0389	0.0033		
Sum of skin Fold thickness (mm)	Male apparently healthy subjects	13	22.154	2.340	-6.479	0.000
	Female apparently healthy subjects	9	37.667	8.246		
Fat-free mass kg)	Male apparently healthy subjects	13	19.698	1.511	2.686	0.014
	Female apparently healthy subjects	9	18.246	0.678		
Body mass Index(kg/m^2)	Male apparently healthy subjects	13	21.650	1.711	0.317	0.754
	Female apparently healthy subjects	9	21.449	0.978		

[Table 3]

Table 3 shows that female patients with severe mental illness had significantly thicker skins than the apparently healthy females.

[Table 4]

Table 5 is a representation of the comparison of research variables between male and female participants who had SMI. Results showed that males with SMI had significantly higher Vo2 max values (t=4.095; p=0.001) than their female counterparts. On the other hand, Female patients with SMI reportedly had significantly thicker skins (t=-4.185; p=0.00) and more weight (t=2.004; p=0.05) than their male counterparts.

[Table 5]

Table 5 shows a comparison of research variables between male and female apparently healthy participants. Results show that apparently healthy males had significantly higher Vo2max values (t=17.150; p=0.000) than their apparently healthy female counterparts, while the females had significantly thicker skin folds (t=6.479) and more Fat mass (t=2.686; p=0.01) than the males.

DISCUSSION

Effect of selected psychotropic drugs on the VO2max values of young patients with severe mental disorder

In this study, forty-four participants participated, which comprised of twenty two patients with severe mental disorder and twenty two apparently healthy subjects.

The study showed that patients with severe mental disorder had significantly lower mean VO_2max, than the apparently healthy subjects. This indicates that apparently healthy subjects had more aerobic capacity than the patients with severe mental disorder. High VO2max is the primary indicator of aerobic fitness, cardiovascular health, and endurance performance [24]. Depressed and anxious individuals exhibit a less active life-style and have a reduced cardiorespiratory fitness in comparison with the general population [4].

It was seen from this study that male patients with severe mental disorder had significant mean VO2max, lower than the male apparently healthy subjects. The study also revealed that the female patients with severe mental disorder had a significant lower mean VO2max, than the female apparently healthy subjects. The mean VO2max of male patients with severe mental disorder was significantly higher than the female patients with severe mental disorder. The mean VO2max of male apparently healthy subjects was seen to be significantly higher than the female apparently healthy subjects .Sedentary lifestyle is more prevalent in the S.M.D population than the general population, leading to poor cardio-respiratory fitness [25] showed that people with schizophrenia (S.M.D) have a low maximum oxygen uptake when compared to a healthy adult population.

Effect of selected psychotropic drugs on the body surface area values of young patients with severe mental disorder

The study showed that patients with severe mental disorder had a significantly higher mean body surface area, than the apparently healthy subjects. This indicates that body surface area of patients with severe mental disorder was affected by psychotropic drug. Male patients with severe mental disorder had insignificantly higher mean body surface area, than the male apparently healthy subjects.

Female patients with severe mental disorder were shown to have insignificantly higher mean body surface area, than the female apparently healthy subjects .The mean body surface area of male patients with severe mental disorder, was slightly lower than the female patients with severe mental disorder. Mean body surface area of male apparently healthy subjects was also seen to be insignificantly higher than the female apparently healthy subjects.

Effects of selected psychotropic drugs on the sum of the skin fold thickness values of young patient with severe mental disorder.

In this study, it was shown that patients with severe mental disorder had significantly higher sum of skin fold thickness than the apparently healthy subjects. This indicates that patients with severe mental disorder tend to have more subcutaneous fat compared to the healthy adult population. This may be due to poor dietary lifestyle, sedentary lifestyle, increase eating habit, and psychotropic drug effects in this SMD population. This study is in line with the work of who stated that Olanzapine-induce weight-gain is associated with increased adiposity which in turn increases risk of developing metabolic syndrome, including cardiovascular disease and impaired glucose tolerance leading to the risk of developing diabetes type II. It was also shown from this study that male patients with severe mental disorder had significant higher sum of skin fold thickness, than the male apparently healthy subjects. The female patients with severe mental disorder had a significant higher sum of the skin fold thickness, than the female apparently healthy subjects .The sum of the skin fold thickness of male patients with severe mental disorder was significantly lower than the female patients with severe mental disorder. The sum of the skin fold thickness of male apparently healthy subjects was also seen to be significantly lower than the female apparently healthy subjects.

Effect of selected psychotropic drugs on the fat-free mass values of young patients with severe mental disorder

The study revealed that patients with severe mental disorder had an insignificantly higher fat-free mass (19.759±0.691kg), than the apparently healthy subjects (19.104±0.303kg).Obesity is common in the SMD population due to poor dietary choices, psychotropic medications, and sedentary lifestyles. Weight gain in psychiatric patients has been associated with decrease general quality of life; even modest weight reduction can have significant health benefits. Atypical antipsychotic drugs (Olanzapine, Clozapine, Resperidone etc) and antidepressants (Citalopram, Venlafaxine, Amitriptyline, Imipramine etc) are responsible for weight gain seen in SMD population. It was seen from this study that male patients with severe mental disorder had insignificant fat-free mass (19.262±0.510kg), lower than the male apparently healthy subjects (19.698±0.419kg). The female patients with severe mental disorder had a significant higher fat-free mass (20.476±1.546kg), than the female apparently healthy subjects (18.246±0.226kg).The fat-free mass of male patients with severe mental disorder (19.262±0.510kg), was slightly lower than the female patients with severe mental disorder (20.476±1.546kg). Fat-free mass of male apparently healthy subjects (19.698±0.419kg), was seen to be slightly higher than those of apparently healthy female subjects (18.246±0.226kg).

Effect of selected psychotropic drugs on the body mass index values of young patients with severe mental disorder

The study showed that patients with severe mental disorder had insignificantly higher body mass index, than the apparently healthy subjects. This indicates that patients with severe mental disorder are more likely to be obese than the healthy adult population. This weight gain observed in patients with severe mental disorder may be as a result of drug induced-sedentary lifestyle seen in this population. This is in line with study conducted by Waterling (2004), to examine the differential effects of psychotic drugs; he found out that both the frequency and amount of weight gained was high in patients treated with Olanzapine (average of 2.3kg/month), Clozapine (1.7kg/month), Questiapine (1.8kg/month), and Zotepine (2.3kg/months).

However, the study also reveals male patients with severe mental disorder to have slightly higher body mass inde, than the male apparently healthy subjects. Female patients with severe mental disorder were shown to have an insignificant higher body mass index, than the female apparently healthy subjects .The average body mass index of male patients with severe mental disorder was significantly lower than the female patients with severe mental disorder, while the mean body mass index of male apparently healthy subjects was shown to be insignificantly higher than the female apparently healthy subjects. Weight-gain is a consequence of positive energy balance resulting from a surplus energy intake (i.e. absorbed calories) above energy expenditure (i.e. used calories in basal metabolic rate, locomotor activity and thermoregulation). Between 55-68% of individuals with bipolar disorder (S.M.D) are over-weight or obese due to a combination of illness- related factors, sedentary lifestyles, and the use of antipsychotic medications compared to the general population at estimated 68 percent [26].

CONCLUSION

Results from this study posits that patients with serious mental illness had significantly lower VO_2max and higher body composition than the apparently healthy psychotropic naïve subjects; which implies that, they tend to have lower aerobic capacity and are more likely to be obese than the healthy adults population. Thus, it is critical thatclinicians take precautions to monitor and control weight-gain.

REFERENCES

1. Hays R.D, Wells K.B, Sherbourne C.D, Rojers W, Spritzer K. "Functioning and well-being outcomes of patients with depression compared with chronic general medical illness". Archives of General Psychiatry. 1995; 52:11-19.
2. Ahuja N. A short Textbook of psychiatry (7th edition). Jaypee Brothers, Medical Publishers (P) Ltd. 2011; 1, 19, 32.
3. Donatello, Rebek J. Health, the Basics. San Francisco: Pear son Education, inc.2005.
4. Zoeller R. Physical activity: depression, anxiety, physical activity, and cardiovascular disease: what's the connection? American Journal of lifestyle Medicine. 2007; 1:175-180.
5. David R.B, Howley E T. Limiting factors for maximum oxygen uptake and determinants of endurance performance. Journal of Med. Sci. Sports Exercise. 2000; 32:70-84.
6. Edward E.T, Bassett D.R, Welch H.G. Criteria for Maximal Oxygen Uptake: Review and commentary. Journal of Med. Sci. Sports Exercise. 1995; 27: 1292-1301.
7. Hill A.V, Lupton H. Muscular exercise, Lactic acid and the supply of oxygen. Journal of Medicine. 1993; 16:35-171.
8. Culpepper M.I, Francis K.T. Journal of theory Biol.1987; 129: 1-8.
9. Shrivastava A, Johnston M. Weight-gain in Psychiatric Treatment: Risks, Implications, and Strategies for Prevention and Management. In: Psychopharmacology Today: Some issues (A.R &S.A Singh eds). 2010; MSM: 53-68.
10. Mottato E.H, Newcomer J.W, Kamat S, Baser O, Harnett J, Cuffel B. Metabolic screening after the American Diabetes Association's consensus statement on antipsychotic drugs and diabetes. Diabetes care. 2009; 32:1035-1042.
11. Fava M. Weight-gain and antidepressants. J clin psychiatry. 2000; 61:37- 41.
12. Garland E.J, Remick R.A, Zis A.P. Weight-gain with antidepressants and lithium. J clin psychopharmacology. 1988; 8:323-330.
13. Livingstone C, Rampes H. A review of its metabolic adverse effects. J psychopharmacology. 2006; 20:347-355.
14. Vestergard P, Amidson A, Schou M. Clinically significant side effect of lithium treatment. Acta psychiatr Scand. 1980; 62:193-200.
15. Correll C.U, Manu P, Olshanskiy V, Napolitano B, Kane J.M, Malhotra. Cardio metabolic risk of second generation antipsychotic medications during first-time use in children and adolescents. J Am Med Assoc. 2009; 302:1765-1773.
16. Citrome L, Vreeland B. Obesity and mental illness. Mod trends pharmacopsychiatry. 2009; 26:25-46.
17. Michelson J, Bancroft S, Targum S, Yongman k., Tepner R. Female sexual dysfunction associated with antidepressant administration: a randomized placebo-controlled study of pharmacologic intervention. Am J psychiatry. 2000; 157:239-243.
18. Bergen D.C, Ristanovic R.K., Waicosky K., kanner A, Hoeppner T.J. Weight loss in patients taking felbamate. Clin Neuropharmacology. 1995; 18:23-27.
19. Dursum S.M, De Varajan S. Clozapine weight-gain, plus topiramate weight loss. Can J psychiatry. 2000; 45:198.
20. Jin H, Merjer J.M, Mudaliar S, Jeste D.V. Impact of atypical antipsychotic therapy on leptin, ghrelin, and adiponectin. SchizophrRes. 2008; 100:70-85.
21. Ackerman S, Nolan L.J. Body weight gain induced by psychotropic drugs: incidence, mechanisms, and management. CNS Drug. 1998; 9:135-151.
22. Astrand P.O, Rodal S.B, Dalil stragman. Textbook of work physiology. New York, Human Kinetics.2003.
23. Mc Ardle, W.D, Katch F.I, Katch V.L. Essentials of Exercise Physiology; 2nd edition; Philadelphia, Lippincott Williams and Wilkins. 2000; 126-140.
24. Zwirend L.P, Freedson A. Advanced Fitness Assessment and Exercise Prescription. Human Kinetics, 9th edition Lippincott, Williams & Wilkins. 1991; 312-319.
25. Brown S, Birtwistle L.R, Thompson C. The Unhealthy Lifestyle of People with Schizophrenia. Psychological Medicine. 1991; 29: 697-701.

Kolotkin R.L, Corey-Lisle P.K., Crosby R.D, Swanson J.M, Tuomari A.V, L'italien, G.J. Impact of Obesity on Health-related Quality of Life in Schizophrenia and Bipolar Disorder. Obesity. 2008; 16:749-754.