Abstract

**Background:** Obesity is a major complication of antipsychotic drugs. This study evaluated the effect of long-term exercise on drug-induced obesity in schizophrenia patients.

**Methods:** This study involved 59 in-patients diagnosed of schizophrenia and randomized into exercise group (EG) and control group (CG). The EG participated in a 24-week exercise protocol (football, aerobic, bicycle ergometer and treadmill) at three sessions per week. Their Waist-Hip-Ratio (WHR), Body-Mass-Index (BMI), Triceps-Skin-Fold (TSF), Subscapular-Skin-Fold (SUBSF), Suprascapular-Skin-Fold (SUPSF) and Front-Thigh-Skin-Fold (FTSF) were measured at baseline and at 12-week and 24-week following the International Standard for Anthropometric Measurements (ISAM). Data was analysed using Analysis of Variance and McNemars test.

**Results:** Mean age of the EG and CG were 37.9 ± 7.4 and 38.4 ± 10.2 respectively. The BMI, TSF, WHR, SUBSF, SUPSF and FTSF values in the EG significantly reduced (p=0.00) at baseline (30.4 ± 3.3, 29.9 ± 9.8, 0.85 ± 0.06, 25.3 ± 7.1, 18.1 ± 6.4, and 43.5 ± 7.1) through 24-week (26.2 ± 4.0, 22.2 ± 4.2, 0.79 ± 0.21, 20.2 ± 0.6, 14.2 ± 0.3 and 30.3 ± 1.2) exercise programme. The EG had significantly lower (p=0.00) values than the CG at 12-week in BMI (29.0±3.5 versus 31.9 ± 5.4), TSF (26.6 ± 11.7 versus 28.2 ± 8.8), WHR (0.82 ± 0.16 versus 1.28 ± 1.8), SUBSF (24.2 ± 7.0 versus 30.7 ± 11.8), SUPSF (17.2 ± 6.7 versus 21.8 ± 9.6), and FTSF (34.2 ± 17.8 versus 40.5 ± 19.7) and at 24 week (BMI: 26.2 ± 4.0 versus 33.2 ± 5.3, TSF: 22.2 ± 4.2 versus 30.2 ± 5.3, WHR: 0.79 ± 0.21 versus 1.29 ± 1.02, SUBSF: 20.2 ± 0.6 versus 31.1 ± 4.2, SUPSF: 14.2 ± 0.3 versus 28.2 ± 6.4, and FTSF: 30.3 ± 1.2 versus 43.1 ± 7.4) post-intervention.

**Conclusions:** Long-term exercise is effective in reducing drug-induced obesity in schizophrenia patients and is useful for both prevention and management of obesity-induced complications in mentally ill individuals.

**Keywords:** Schizophrenia; Exercise; Obesity; Pharmacotherapy

Introduction

Drug-induced weight gain has been identified as a major risk factor for morbidity and mortality in individual suffering from mental illnesses including schizophrenia [1,2]. The tendency of most second generation antipsychotic to induce weight gain has renewed interest in weight problem in psychiatry patients [3]. Overweight and obesity is a common problem in schizophrenia with 40% to 60% of them being obese [3]. Exercise is effective in reducing the weight gained and prevent complications in individuals using on anti-psychotic therapy [4,5]. Although a desirable amount of fat is essential for normal body functioning [6], obesity and overweight are associated with various health problems, such as heart diseases, diabetes mellitus, hyperlipidemia, osteoporosis, gout, cancer and osteoarthritis [7-10].

Obesity as well as mental illness have been identified to have negative impact on the quality of life of an individual [11,12]. Individual with schizophrenia are at high risk of developing obesity-related complications and cardio-respiratory conditions [13]. Obesity is a chronic condition that requires long term management and poses challenges on the choice of pharmacotherapy for neuropsychiatry conditions [14]. However, the resultant complimentary effect of exercises with the use of anti-psychotic drug has not been documented. It is also not clear at what week will an individual who has drug-induced obesity will yield to exercise intervention while still on the anti-psychotic therapy. Therefore, this study evaluated the effect of a twenty-four week exercise on drug-induced obesity in schizophrenic patients and documents the time that will be required to achieve effective control of the obesity.

Methods

This study was approved by the Ethical Review Committee of the Federal Neuro-Psychiatry Hospital, Lagos. The nature, purpose and procedure of the study were explained to the participants in detail. Informed consent of the participants and their parents/spouses/children were obtained.

This study involved 59 (29 males and 30 females) in-patients diagnosed of schizophrenia in a Nigeria tertiary Mental Health Institution. They were distributed randomly into exercise and control groups. The exercise group had of 30 (13 males and 17 females) patients while the control group had 29 patients (16 males and 13 females). The exercise group was involved in a twenty-four week exercise protocol. The cardiovascular fitness level of the participants in the two groups was determined by both the Cooper’s 15 minutes run-walk test and one kilometer run test. The following measurements were also taken before the commencement of the programme and at 12th-week and 24th-week post-exercise: Hip circumference and waist circumference (to calculate the Waist-Hip Ratio (WHR)), height and weight (to calculate the Body Mass Index (BMI)), Triceps-Skin Fold (TSF), Subscapular-Skin-Fold (SUBSF), Suprascapular-Skin-Fold (SUPSF) and Front-Thigh-Skin-Fold (FTSF) of the right lower limb.

*Corresponding author: Caleb Ademola Gbiri, College of Medicine, University of Lagos, Idi-Araba, Lagos, Nigeria, Tel: +2348033598072; E-mail: calebgbiri@yahoo.com

Received January 19, 2012; Accepted February 17, 2012; Published February 20, 2012

Citation: Tella BA, Gbiri CA, Adedarakan A, Odebiyi DO and Owoeye OA (2012) Effect of Long-Term Exercise on Drug-Induced Obesity in Schizophrenic Patients. J Addict Res Ther 3:120. doi:10.4172/2155-6105.1000120

Copyright: © 2012 Tella BA, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.
The adiposity indices were assessed according to the International Standards for Anthropometric Assessments.

Weight was measured to the nearest 1kg using a portable weighing scale (Stadiometer, Secca Model). Height was measured to the nearest 0.1cm with a portable height meter (Stadiometer, Secca Model). The Body Mass Index (BMI) was calculated from the weight-to-height ratio (weight/height²). A skinfold caliper (FAT-O-METER, Novel, Germany) was used to estimate skinfold thickness to the nearest 1mm. The triceps skinfold (TSF) was taken at the level of mid-point between the acromion and olecranon processes. The Subscapular-Skin-Fold (SUBSF) was taken at the level of the mid-point of the subscapularis muscle. The Suprascapular-Skin-Fold (SUSSF) was taken at the level of the mid-point of the suprascapularis muscle. The Front-Thigh-Skin-Fold (FTSF) of the right lower limb was taken at the level of the mid-point of the supraspinatus muscle. The Front-Thigh-Skin-Fold (FTSF) of the right lower limb was taken at the level of the mid-point of the subscapularis muscle. The Suprascapular-Skin-Fold (SUSSF) was taken at the level of the mid-point of the subscapularis muscle. The Suprascapular-Skin-Fold (SUSSF) was taken at the level of the mid-point of the subscapularis muscle. The Front-Thigh-Skin-Fold (FTSF) of the right lower limb was taken at the level of the mid-point of the supraspinatus muscle. The Front-Thigh-Skin-Fold (FTSF) of the right lower limb was taken at the level of the mid-point of the subscapularis muscle.

Results

The mean age, height, weight and body mass index of the participants was 37 ± 12.4, 1.58 ± 0.75, 76.5 ± 14.0 and 31.8 ± 5.8. There was progressive reduction in the mean adiposity indices (Waist-Hip-Ratio, Body Mass Index, Triceps-Skin-Fold, Subscapular-Skin-Fold, Suprascapular-Skin-Fold and Front-Thigh-Skin-Fold) from baseline to 12th-week and from 12th-week to 24th-week (Table 1). The BMI, TSF, WHR, SUBSF, SUPSF and FTSF values in the exercise group significantly reduced (p=0.00) at baseline (30.4 ± 3.3, 29.9 ± 9.8, 0.85 ± 0.06, 25.3 ± 7.1, 18.1 ± 6.4, and 43.5 ± 7.1) through 24-week (26.2 ± 4.0, 22.2 ± 4.2, 0.79 ± 0.21, 20.2 ± 0.6, 14.2 ± 0.3 and 30.3 ± 1.2) exercise programme (Table 2). There was significant reduction in the pre-exercise and 24th week values of Waist-Hip-Ratio, Body Mass Index, Triceps-Skin-Fold, Subscapular-Skin-Fold, Suprascapular-Skin-Fold and Front-Thigh-Skin-Fold in the exercise group (Table 2). The exercise group had significantly lower (p=0.00) values than the control group at 12-week in BMI (29.0 ± 3.5 versus 31.9 ± 5.4), TSF (26.6 ± 11.7 versus 28.2 ± 8.8), WHR (0.82 ± 0.16 versus 1.28 ± 1.8), SUBSF (24.2 ± 7.0 versus 30.7 ± 11.8), SUPSF (17.2 ± 6.7 versus 21.8 ± 9.6), and FTSF (34.2 ± 17.8 versus 40.4 ± 19.7) and at 24 week (BMI: 26.2 ± 4.0 versus 33.2 ± 5.3; TSF: 22.2 ± 4.2 versus 30.2 ± 5.3; WHR: 0.79 ± 0.21 versus 1.29 ± 1.02; SUBSF: 20.2 ± 0.6 versus 31.1 ± 4.2; SUPSF: 14.2 ± 0.3 versus 28.2 ± 6.4, and FTSF: 30.3 ± 1.2 versus 43.1 ± 7.4) post-intervention (Table 3). There was significant reduction in the values of Waist-Hip-Ratio, Body Mass Index, Triceps-Skin-Fold, Subscapular-Skin-Fold, Suprascapular-Skin-Fold and Front-Thigh-Skin-Fold values in the exercise groups from baseline through 12 weeks and 24 weeks of exercise (Table 3). There was significant increase in the values of Waist-Hip-Ratio, Body Mass Index, Triceps-Skin-Fold, Subcapular-Skin-Fold, Suprascapular-Skin-Fold and Front-Thigh-Skin-Fold values in control groups from baseline through 12 weeks and 24 weeks of exercise programme (Table 3).

Discussion

The main aim of this study was to evaluate the effect of a twenty-four week exercise on drug-induced obesity in individuals diagnosed of schizophrenia. This study is very pertinent as drug-induced overweight and obesity and attendant consequences are major problems in the choice of pharmacotherapy and successful treatment of many mentally ill individuals including schizophrenia. Sometimes, the dosages of the prescribed drugs are adjusted in other for the
patients to have a reduction in weight. This often contributes to the frequent relapse and possible re-admission commonly experience in individuals with psychiatry illnesses [15-17]. Weight loss is a difficult task but it worth the effort when it is eventually achieved in an individual [18], especially in individuals with drug-induced weight gain. Management of overweight and obesity poses a lot of challenges to psychiatrists and physiotherapist working in mental health settings due cyclical issues in mental health and weight managements [5]. Often time, patients who are either overweight or close to being obese continue with prescribed drugs to prevent relapse. Physiotherapists are often called to work on their weight to keep it within physiological limits.

The finding that there was significant reduction in the pre-exercise and 24th-week post-exercise assessment of indices of adiposity shows that exercise can be used in the effective management of drug-induced obesity in schizophrenic patients. The significant reduction experienced between the pre-exercise and 24th-week post-exercise values of indices of adiposity implies that effective management of drug-induced obesity requires long term meticulous exercise intervention. However, unlike apparently healthy individuals who will focus mainly on weight reduction to achieve their goals, the mentally ill individuals need to juxtapose their goals between the amelioration of their mentally ill state and their maintenance of weight within physiological limits. Effective weight reduction must be accomplished by nutritional and behavioural adjustments. However, anti-psychotics have been shown to increase appetite and food craving. This has been a stumbling block of nutritional management in mentally ill individuals. This may attributed to the insignificant reduction between the baseline and 12th-week post-exercise values of indices of adiposity in the participants. We can attribute the reductions we recorded at this stage to the fact that the patients were still under the control of the mental health officers. Their meals and vocation were regimented. They cannot just eat anything they want unless the one that was provided to them. Their activities were regulated along programme of the hospital which includes psychotherapy, occupational and vocational therapy, social interactions and games. These programmes may have also play complimentary role in our exercise programme.

However, since these adjourning activities were not under our control, we may not be able to account for their contribution to the weight management of the patients. The statistically insignificant reduction in weight between baseline and 12th may be attributed to the fact that the patients still on regular medication. Most in-patients in the hospital spend a minimum of six weeks on admission. At this period, they medications are regular and frequent. Therefore, the patients will move in the cycle of gaining-losing-gaining of weight. This cycle may hinder appreciable progress in the weight reduction programme. This points to the fact that physiotherapist should not be tired in the weight management of mentally ill individuals. At least, if the weight is not significantly reducing, it cannot get worst.

The fact that there was significant increase in the adiposity indices of the non-exercise group from baseline throughout the study period confirms the fact the individuals on anti-psychotic drug accumulate weight. This calls for redirection of effort towards prevention of obesity complications during anti-psychotic therapy. Exercise must therefore be incorporated as part of the routine treatment of individuals undergoing anti-psychotic therapy. Exercise should therefore be used in both preventive and management of drug-induced obesity in the management of mentally ill individuals. This will go a long way in reducing other complications that may arise as a result of therapy.

### Conclusion

Obesity and overweight are common among individuals on anti-psychotic therapy. Long-term exercise is effective in reducing drug-induced obesity in schizophrenic patients and is useful for both prevention and management of obesity-induced complications in mentally ill individuals.

### References


