Brief report

Prevalence of obesity and metabolic syndrome in a long-stay psychiatric unit

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Ir J Psych Med 2011; 28(4): 205-208

Abstract

Objective: The aim of this study was to determine the prevalence of metabolic syndrome and obesity as defined by Body Mass Index (BMI) in a long-stay psychiatric unit where all care is provided by the psychiatric team.

Method: All residents in this long-stay unit were screened. Their BMI was calculated. Waist circumference and blood investigations were done. Ward records were used to determine those who had been previously diagnosed with hypertension and diabetes. The ATP 111 criteria were used to determine the prevalence of metabolic syndrome.

Results: We found a prevalence of 33% for BMI obesity and a prevalence of 66% for metabolic syndrome. These are higher than those of the general Irish middle aged population and the accepted estimate of a general psychiatric population. It is also higher than that of a previous published study on an Irish long-stay psychiatric ward population.

Conclusion: There is high prevalence of BMI obesity and metabolic syndrome in long-stay psychiatric residents. This has the potential to impact significantly on physical morbidity and mortality. People with severe and enduring mental illness should have access to primary care and other health services on the same basis as any other citizen.

Key words: Metabolic syndrome; Body Mass Index; Obesity; Waist circumference; Long-stay.

Introduction

Serious mental disorder is associated with the need for continuing psychiatric care. This may lead to reception into long-stay care facilities.[1] Serious mental disorder is associated with increased morbidity and mortality.[2] Patients with schizophrenia have been found to have a standardised mortality ratio three times that of the general population for illnesses affecting the cardiovascular, respiratory, endocrine and alimentary systems.[3-5] Affective disorders[6-8] and learning disability[9-11] are also associated with increased morbidity and mortality. Other factors that affect morbidity include obesity, malnutrition, smoking, alcohol, substance use and medical comorbidities.[3,12]

Metabolic syndrome is a cluster of factors that predispose to cardiovascular disease and diabetes mellitus.[13] It is increasingly being recognised as highly prevalent in people receiving psychotropic medications.[14] It has also been proposed that metabolic syndrome may be associated with psychiatric illness independently of prescribed medication.[15] The regular screening and early detection of this syndrome would offer psychiatric patients better health outcomes.[16]

There are different criteria used to diagnose and define metabolic syndrome.[13] It may be relatively easily identified in the clinical setting through use of the Adult Treatment Panel (ATP) 111 criteria.[17] It sets out the presence of abnormalities in at least three of the stated areas as defining metabolic syndrome *(see Table 1)*.

The prevalence of metabolic syndrome according to the ATP 111 criteria was 20.7% in an Irish population of people aged 50-69 years attending primary care.[18] The prevalence in a long-stay psychiatric ward in Limerick was 40.7%.[19]

In this study, we assessed residents in long-stay care in Kilkenny Mental Health Service for metabolic syndrome, noting any important associations that arise. These residents do not receive routine GP care and there is no dietetic service assigned to the unit from the general hospital. Their basic physical care is provided by the treating psychiatric team with referrals to the general hospital or specialist services where necessary.

Method

Ethical approval for this study was sought and clearance was obtained from the regional ethics committee. St Luke's Ward caters for people with enduring and severe mental illness without cognitive impairment. People with identified cognitive impairment are catered for in a different specialised unit. All residents in St Luke's long-stay unit gave consent to their participation in the study. They were screened for Body Mass Index (BMI) obesity and metabolic syndrome. Their blood samples were taken for the haematological components of the ATP 111 criteria. Screening for the syndrome involved collection of 12-hour fasting lipid profile and 12-hour fasting blood sugar. Residents were confirmed to be fasting by self report and nursing collaboration. Haematological investigations were processed centrally in the general hospital laboratory. Their smoking status was determined from self report and nursing collaboration while information on antipsychotic medication use and medical illness were obtained from case notes.

Where residents were found to have more than one psychiatric diagnosis, the predominant illness for which the patient

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SUBMITTED: NOVEMBER 7, 2008. ACCEPTED: OCTOBER 25, 2010.

Table 1: ATP 111 Criteria for defining Metabolic Syndrome (≥ 3 variables define the syndrome)

Variable	Measure
Waist Circumference	> 102 cm (men) > 88 cm (women)
Fasting Triglycerides	≥ 1.69 mmol/l
High Density Lipoprotein	< 1.04 mmol/l (men) < 1 .29 mmol/l (women)
Blood Pressure	Systolic ≥ 130mmHg Diastolic ≥ 85mmHg Previously Diagnosed Hypertension
Fasting Blood Sugar	> 6.1 mmol/l On Insulin or hypoglycaemic

was being hospitalised was considered as the primary diagnosis and the other ones as secondary.

Statistics

Results are expressed as mean ± standard deviation (SD). Range of values is expressed where necessary. 95% Confidence intervals are used to express precision of sum total measurements. Independent t-tests and Fischer's exact tests were used for parametric and non-parametric data as appropriate. A nominal significance level of = 0.05 was used.

Results

Subjects

A total of 11 (36.7%) male residents and 19 (63.3%) female residents participated in the study. The mean age was 70.43 years (range of 51-88 years). The mean age for men was 68.0 years and the mean age for women was 71.84 years.

The primary diagnosis was schizophrenia and schizoaffective disorder in 16 (55%) residents. Six residents (20%) were being managed for bipolar affective disorder, four (13%) residents had learning disability and one (5%) resident was being managed for personality disorder. Other primary diagnoses were Huntington's disease, Korsakoff psychosis, and psychotic depression in remission found in one patient each. Illnesses like obsessive compulsive disorder, unspecified mood disorder, and somatisation syndrome are examples of secondary diagnoses.

The mean duration of psychiatric illness was 21.62 ± 16.24 years *(see Table 2)*. Males had a significantly longer duration of illness (t = 3.91, df = 24, p = 0.006).

Metabolic syndrome

In total 20 (66%) residents fulfilled the ATP 111 criteria for metabolic syndrome. The male prevalence was 63.6% (n = 7) and the female prevalence was 68.4% (n = 13).

When considered according to age groups, the prevalence was one (5%) resident in the 50-59 age group, seven (35%) residents in the 60-69 age group, nine (49%) residents in the 70-79 age group and the 80-89 age group accounted for three (15%) residents.

The measurements for the various components are presented in *Table 2*. There was no significance between

Table 2: Breakdown of Results According to Gender and Their Total (Mean ± SD

	Male	Female	Total
No. of residents	11(36.7%)	19 (63.3%)	30 (100%)
Mean age	68.0 ± 10.12 years	71.84 ± 8.66 years	70.43 ± 9.24 years 95% CI: 66.98-73.88
Age range	51-88 years	53-84 years	51-88 years
Duration of Illness	34.20 ± 13.10 years	13.75 ± 12.86 years	21.62 ± 16.24 years 95%CI: 15.05-28.18 years
BMI	27.18 ± 5.65 kg/m2	29.23 ± 8.52kg/m2	28.48 ± 7.55 kg/m^2 (95% CI: 25.66-31.30%)
Waist circumference	108 ± 15.97cm (95% CI: 97.27–118.73)	97.26 ± 20.85cm (95%CI: 87.22-107.31)	101.20 ± 19.63 95% CI: 93.87-108.53cm
Triglycerides	1.39 ± 0.76 mmol/l	1.82 ± 1.48 mmol/l	1.66 ± 1.27 mmol/l 95%CI: 1.19-2.14mmol/l
HDL	1.03 ± 0.45 mmol/l	1.09 ± 0.33 mmol/l	1.07 ± 0.37 mmol/l 95%CI: 0.93-1.21mmol/l
Systolic BP	130.64 ± 10.99 mmHg	144.21 ± 26.94 mmHg	139.23 ± 23.16 mmHg 95% CI: 130.59-147.88mmHg
Diastolic BP	77.91 ± 8.69 mmHg	75.79 ± 7.69 mmHg	76.57 ± 7.99 mmHg 95% CI: 73.58–79.55 mmHg
Fasting blood sugar	5.96 ± 0.89 mmol/l	6.84 ± 2.20 mmol/l	6.53 ± 1.87 mmol/l 95% CI: 5.80-7.25mmol/l
Metabolic syndrome	7 patients (63.6%)	13 patients (68.4%)	20 patients (66.7%) 95% CI: 47.19-82.71%

gender differences in mean waist circumference (p = 0.15), mean triglyceride levels (p = 0.31), mean HDL levels (p = 0.67), mean systolic blood pressure (p = 0.66), mean diastolic blood pressure (p = 0.49) and mean fasting blood sugar (p = 0.22).

Primary diagnosis in metabolic syndrome

Of the 20 residents diagnosed with metabolic syndrome, 11 (55%) had a primary diagnosis of schizophrenia and schizoaffective disorder (psychotic disorders), six (30%) had bipolar affective disorder (BPAD), two (10%) had learning disability (LD). One (5%) resident was being managed for personality disorder (PD). Graphical comparison of these numbers against the total number of residents with similar diagnosis is shown in *Figure 1*.

Antipsychotic medication in metabolic syndrome

Of the 30 long-stay residents, 25 (83.3%) residents were on antipsychotic medication. Of these 16 (64%) residents had metabolic syndrome. In total nine (30%) residents were on antipsychotic polypharmacy (concomitant use of two or more antipsychotic medications). Of these seven (77.8%) had metabolic syndrome.

https://doi.org/10.1017/S0790966700011666 Published online by Cambridge University Press

Table 3: Types of antipsychotic medications implicated and their mean doses

Antipsychotic	Number of patients	Mean dose (mg/day)	Chlorpromazine equivalent[20,21]
Chlorpromazine	6	87.7mg	-
Haloperidol	1	10mg	333.3mg
Trifluoperazine	1	15mg	300mg
Olanzepine	8	10.3mg	206mg
Risperidone	7	2.9mg	193.3mg
Quetiapine	4	156.3mg	208.4mg
Amisulpride	1	200mg	200mg
Fluphenazine Depot	4	22.66mg/weekly	453.2mg/weekly
Flupenthixol Depot	3	33.3mg/weekly	333mg/weekly

The types of antipsychotics which residents were receiving, their mean doses are shown in the *Table 3*. Fluphenazine and flupenthixol were the only types of depot injections prescribed.

Medical comorbidity

Four residents (15%) were diagnosed as diabetic, 13 residents (43%) were hypertensive. Of the four residents that were diabetic, three of them (75%) also had hypertension. A total of 23 residents (77%) had dyslipidaemia (hypercholesterolaemia and/or hypertriglyceridaemia).

Considering end organ damage, two residents were being managed for myocardial infarction, two residents were being managed for cerebrovascular accident (CVA), two residents had renal impairment and one resident had diabetic retinopathy.

A total of 20% of residents (n = 6) had one medical comorbidity, 60% (n = 18) had two or more medical comorbidities. These comorbidities spanned all physiologic systems. Residents were receiving treatments started by the treating psychiatric team, specialists at the general hospital or regional hospital. A total of 66% (n = 16) of residents with at least one medical comorbidity (n = 24) had metabolic syndrome.

BMI

The mean BMI for men and women is shown in *Table 2*. The mean BMI for the resident sample was 28.48 ± 7.55kg/m^2. Eleven (36.67%) residents had normal BMI, nine (30%) were overweight (BMI of 25-29.9) while 10 (33%) were in the obese category (BMI > 30). This obese category consisted of eight (80%) women and two (20%) men.

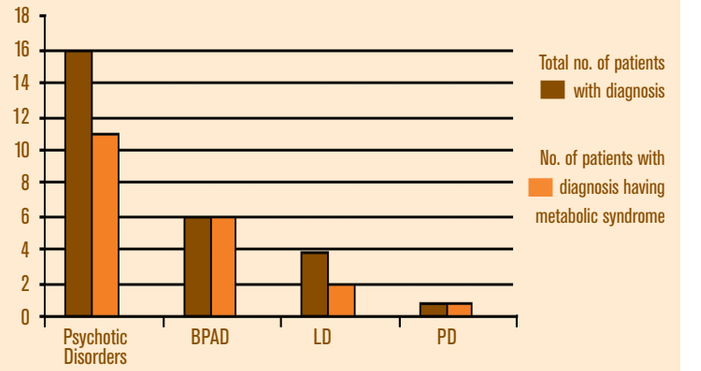
Smoking

In total 14 residents (46%) smoke cigarettes. Of these, eight (57%) had metabolic syndrome. Of the 16 residents who do not smoke, 12 (75%) had metabolic syndrome.

Discussion

In our study, 66% of residents fulfilled the criteria for metabolic syndrome. This is significantly higher than the prevalence for middle aged Irish population (20.7%).[18] It is also higher than the CATIE study value of 42.7% in psychiatric patients.[22]

Figure 1: Distribution of diagnosis in metabolic syndrome compared with diagnosis in study group



When compared to studies in rehabilitation settings, it is higher than the prevalence of 40.7% recorded in a Limerick long-stay ward that had 27 patients[19] (p = 0.0497) and comparable to the 68% obtained in an Australian rehabilitation setting.[23]

Our patient population (mean age of 70.43 years) are generally older than the Limerick cohort (mean of 55.18 years). This may be the reason our prevalence is higher than theirs. While the Australian study only considered patients with chronic psychosis, our study involved more diagnoses. When just the group of patients with chronic psychosis are considered from our own study, a comparable value of 68.8% (n = 11) is obtained.

Different from McEnvoy et al[22] and O'Brien et al,[19] we found in our study that females had statistically similar prevalence of metabolic syndrome compared to men (p = 0.78). Also, similar waist circumference measures were obtained across gender (p = 0.15). It is possible that these may have been different if we had a large number of subjects on which to base estimation.

The prevalence of BMI obesity in our study population was 33%; this was higher than the 2007 prevalence of 18% in the general Irish population[24] but lower than the O'Brien Limerick study prevalence of 51.9%.[19] Since our patient group are generally older than the Limerick group this may reflect a recognised limitation in using BMI as a measure of obesity, ie. that older people tend to have lower BMI given age related loss of muscle mass, while the proportion of body fat may increase.[25]

Our study supports the well known proposition that metabolic syndrome is common in patients with schizophrenia[26] and in patients who are taking antipsychotic medications.[27] It is also in line with a less well appreciated proposition that affective disorders like bipolar affective disorder are also associated with significant metabolic morbidity.[28,29] In our study, all long-stay residents with bipolar affective disorder met the ATP 111 criteria for the syndrome *(see Figure 1)*.

Comparing the groups with schizophrenia and bipolar affective disorder, there was statistically significant difference between them (Expectation of A = 2.91 and p = 0.01). Considering the practical fact that psychotic and affective disorders form a significant proportion of rehabilitation psychiatry case load, in our case 73%, this study emphasizes the usefulness of careful assessment and management of metabolic comorbidities in psychiatric long-stay settings.[30,31]

https://doi.org/10.1017/S0790966700011666 Published online by Cambridge University Press

Is long-stay psychiatric care then a special risk factor for metabolic syndrome? Our study illustrates the peculiar vulnerability that exists in long-stay care. Here, enduring psychiatric diagnoses and the long term use of antipsychotic medications known to be associated with dyslipidaemia and weight gain combine with medical comorbidities and its treatments to raise the prevalence of metabolic syndrome far above general population and general psychiatric patient levels. These may be compounded by the lack of a range of services to mitigate these risks.

We recently introduced a new physical examination form for use in our long-stay facilities. It includes the documentation of residents' BMI and waist circumference. By monitoring trends in these values, early management can be commenced to reduce morbidity in our residents. A new investigation form that allows trends in haematological values to be easily monitored has also been introduced.

People with mental illness have poor access to services compared to other populations.[32] They are low priority for resource providers. The results of this study are being used to support the case for better general health services for people with severe and enduring mental illness including access to primary care services on the same basis as any other citizen.

Access to dietician services has not been available on our ward. We hope to use this study to make a case for the funding of dietetic services as an essential component of the treatment services for this cohort of residents. Additionally we have found it necessary to liaise with the psychiatric hospital catering department to ensure provision of healthy meal options to this patient group.

Conclusion

Whilst it is recognised that there is high prevalence of metabolic syndrome among people with mental illness; people with serious and enduring mental illness represent a particularly vulnerable group given the higher prevalence rate in the latter. This awareness should prompt regular screening, early detection and special provision in service planning for this group of service users.

Declaration of Interest: None

References

1. Doherty DT, Walsh D, Moran R. Happy Living Here...A Survey and Evaluation of Community Residential Mental Health Services in Ireland. Dublin: Mental Health Commission; 2007.
2. Rasanen S, Hakko H, Viilo K, Meyer-Rochow VB, Moring J. Excess Mortality among Long-Stay Psychiatric Patients in Northern Finland. Soc Psych Psychiatric Epidemi 2003; 38(6): 297-304.
3. Brown S, Barraclough B, Iniskip H. Cause of the Excess Mortality in Schizophrenia: A record Linkage Study. Br J Psych 2000;177: 212-7.
4. Osby U, Correla N, Brandt L et al. Mortality and Causes of Death in Stockholm County. Schiz Res 2000; 45(1-2): 21-8.
5. Enger C, Weatherby L, Reynolds RF, Glasser DB et al. Serious Cardiovascular Events and Mortality Among Patients With Schizophrenia. J Nerv Mental Dis 2004; 192: 19-27.
6. Heiskanen TH, Niskanen L, Hintikka JJ et al. Metabolic Syndrome and Depression: A Cross- Sectional Analysis. J Clin Psych 2006; 67: 1422-7.
7. Dinan TG. The Physical Consequences of Depressive Illness. Br J Psych 1999; 318: 826.
8. Jones LE, Carney CP. Increased Risk for Metabolic Syndrome in Persons Seeking Care for Mental Disorders. Ann Clin Psych 2008; 18(3): 149-55.
9. Hollins S, Attard MT, Von Fraunhofer N et al. Mortality in People With Learning Disability: Risks, Causes, and Death Certification Findings in London. Develop Med and Child Neurol 1998; 40: 50-6.
10. Lyndsey M. Comprehensive Health Care Services for People with Learning Disabilities. Adv Psych Treatment 2002; 6: 138-47.
11. Ouellette-Kunz H, Garcin N, Lewis S et al. Addressing Health Disparities through Promoting Equity for Individuals with Intellectual Disability. Queen's University, Kingston, Canada. Health Equity for Intellectually Disabled Individuals Program; 2004 [updated 2004; cited]; Available from: http://www.igh.ualberta.ca/RHD/Synthesis/Disabilities.htm.
12. Marder SR, Essock SM, Miller AL et al. Physical Health Monitoring with Schizophrenia. Am J Psych 2004; 161: 1334-49.
13. Pyorala K. Metabolic Syndrome- A Myth or Useful Concept. European Society of Cardiology; 2006 [updated 2006; cited]; Available from: http://www.escardio.org/congress/world_congress_cardiology_2006/congressreports/pages/719000_pyorala.aspx.
14 Gothe JW, Szarek BI, Caley CF, Wolley SB. Signs and Symptoms Associated With the Metabolic Syndrome in Psychiatric Inpatients Receiving Antipsychotics: A Retrospective Chart Review. J Clin Psych 2007; 68: 22-8.
15. Toalson P, Ahmed S, Hardy T, Kabinoff G. The Metabolic Syndrome in Patients With Severe Mental Illness. J Clin Psych 2004; 6: 152-8.
16. Stahl SM. The Metabolic Syndrome: Psychopharmacologists Should Weigh the Evidence for Weighing the Patient. J Clin Psych 2002; 63: 1094-5.
17. Alexander CM, Landsman PB, Teutsch SM, Haffer SM. Third National Health and Nutrition Examination Survey (NHANES); National Cholesterol Education Program (NCEP). NCEP Defined Metabolic Syndrome, Diabetes, and Prevalence of Coronary Heart Disease among NHANES 111 participants Age 50 and Older. Diabetes 2003; 52: 1210-4.
18. Villegas R, Perry U, Creagh D, Hinchion R, O'Halloran D. Prevalence of the Metabolic Syndrome in Middle-aged Men and Women. Diabetes Care 2003; 26: 3198-9.
19.O'Brien S, Devitt E, Mohammed A, Colm M. High Prevalence of Risk Factors for Physical Illness in a Long-stay Psychiatric Unit. Ir J Psychol Med 2007; 24(2): 55-8.
20. Bazire S. Psychotropic Drug Directory 2009. Aberdeen: Healthcomm UK Ltd; 2009.
21. Woods SW. Chlorpromazine Equivalent Doses for the Newer Atypical Antipsychotics. J Clin Psych 2003; 64: 663-7.
22. McEnvoy JP et al. Prevalence of the Metabolic Syndrome in Patients with Schizophrenia: Baseline Results from the Clinical Antipsychotic Trial of Intervention Effectiveness (CATIE) Schizophrenia Trial and Comparison with National Estimates from NHANES 111. Schiz Res 2005; 80: 19-32.
23. Tirupati S, Chua L. Obesity and Metabolic Syndrome in a Psychiatric Rehabilitation Service. Aust NZ J Psych 2007; 41(7): 606-10.
24.Department of Health and Children. Survey of Lifestyle, Attitudes and Nutrition in Ireland 2007: Dietary Habits of the Irish Population.; 2008 [cited 2009 10 May]. Available from http://www.dohc.ie/publications/pdf/slan_summary.pdf?direct=1.
25. Micozzi MS, Albanes D. Three Limitations of the Body Mass Index. Am J Clin Nutrition 1988; 48: 691-2.
26. Heiskanen T, Niskanen L, Lyytikainen R, Saarinen P, Hintikka J. Metabolic Syndrome in Patients With Schizophrenia. J Clin Psych 2003; 64: 575- 579.
27. Newcomer JW, Haupt DW. The Metabolic Effects of Antipsychotic Medications. Can J Psych 2006; 51: 480-491
28. Garcia- Portilla MP et al. The Prevalence of Metabolic Syndrome in Patients with Bipolar Disorder. J Affect Dis 2008; 106: 197-201
29. Fagiolini A, Frank E, Scott JA, Turkin S, Kupfer DJ. Metabolic Syndrome in Bipolar: Findings from the Bipolar Disorder Center for Pennsylvanians. Bipolar Dis 2005; 7: 424-430.
30. Cormac I, Ferriter M, Martin D. Improving the Physical Health of Long-stay Psychiatric Patients. Adv Psych Treatment 2004; 10: 107-15.
31. Lambert TJR, Velakoulis D, Pantelis C. Medical Comorbidity in Schizophrenia. Schizophrenia 2003; 178: S67-S70.
32. Carney C, Allen J, Doebbeling M. Receipt of Clinical Preventive Medical Services among Psychiatric Patients. Psych Serv 2002; 53: 1028-1030.