A UK Audit of Screening for the Metabolic Side Effects of Antipsychotics in Community Patients

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Reviews of the association between psychotic disorder, the metabolic syndrome, diabetes, and antipsychotic drugs conclude that there is a need for active, routine physical health screening of patients’ prescribed antipsychotic drugs. From published guidelines, we derived the audit standard that all such patients should, as a minimum, have their blood pressure, body mass index (BMI) (or other measure of obesity such as waist circumference), blood glucose (or HbA1c), and plasma lipids measured at least once a year. We conducted an audit of the clinical records of 1966 eligible patients under the care of 48 multidisciplinary, assertive outreach clinical teams in 21 mental health services across the United Kingdom. This revealed a recorded measurement within the previous year for blood pressure in 26% of the patients, obesity in 17%, blood glucose (or HbA1c) in 28% and plasma lipids in 22%, with all 4 measures documented in 11%. In the total national sample, 6% had a documented diagnosis of diabetes, 6% hypertension, and 6% dyslipidemia. Extrapolating from the prevalence of these disorders in similar populations suggests that for every patient with a known diagnosis of diabetes, another had not been recognized, for every known case of hypertension, 4 had been missed, and for every known case of dyslipidemia, 7 had been missed. The responses of the clinical teams to a questionnaire yielded information on obstacles to screening in routine practice, revealing uncertainty about whose responsibility this was, a lack of confidence about the interpretation of abnormal screening results, and limited access to basic equipment.

Key words: metabolic syndrome/obesity/diabetes/dyslipidemia/hypertension/psychosis

Introduction

Clinical Background

Life expectancy in people with schizophrenia is reduced by 20%, with 60% of the excess mortality due to physical illness. This may be partly explained by the poor diet, lack of exercise, and high prevalence of smoking in people with schizophrenia compared with the general population; as a consequence, the prevalences of type 2 diabetes and cardiovascular disease are increased. Further, schizophrenia itself may be a risk factor for diabetes, and there is also increasing concern that antipsychotic drugs, particularly second-generation antipsychotics (SGAs), have metabolic consequences that contribute to the risk. For example, these drugs can cause significant weight gain and this may be one of the mechanisms by which they increase the incidence of diabetes; they may also have a direct effect on insulin function as much antipsychotic-related diabetes occurs in the absence of weight gain.

The metabolic syndrome is a cluster of features (hypertension, central obesity, glucose intolerance/insulin resistance, and dyslipidemia) that is predictive of both type 2 diabetes and cardiovascular disease. Such features are prevalent in people with psychotic disorders who are receiving antipsychotic medication. The precise relationship between antipsychotic drugs, glucose homeostasis, obesity, and the metabolic syndrome remains uncertain, but it is clear that people with schizophrenia treated with antipsychotic medication have a high rate of the individual features of the metabolic syndrome, and the syndrome itself.

A host of reviews of the association between psychotic disorder, the metabolic syndrome, diabetes, and antipsychotic drugs have concluded that there is a need for active, routine physical health screening of all individuals receiving treatment with antipsychotic drugs.
and that is also the recommendation of the National Institute for Clinical Excellence treatment guideline for schizophrenia and the 2006 Prodigy primary care guideline on the management of schizophrenia.

Current Practice

There is some evidence that screening rates for aspects of the metabolic syndrome in routine clinical practice in psychiatry are suboptimal. For example, a recent UK prescription survey of 606 inpatients who were prescribed antipsychotic drugs found that 41% had been screened for diabetes (identifying an apparent prevalence of diabetes or impaired fasting glucose of 6.4%), 4% had fasting lipids measured (identifying an apparent prevalence of dyslipidemia of 1%), and 19% had their weight recorded (identifying an apparent prevalence of overweight or obesity of 14%). When these parameters were directly measured, 17% had diabetes or impaired fasting glucose, 68% had a dyslipidemia, and 62% were overweight or obese.

The Prescribing Observatory for Mental Health

The Prescribing Observatory for Mental Health (POMH-UK) is a national quality improvement program coordinated by the Royal College of Psychiatrists' Centre for Quality Improvement in the United Kingdom. Discrete areas of prescribing practice thought to be worthy of improvement are identified. For each of these, an audit cycle is designed with the aim of supporting quality improvement, eg, a baseline audit against published, evidence-based standards, followed by the delivery of bespoke change interventions and one or more subsequent reaudits. All hospital trusts and private health care organizations that provide specialist mental health services in the United Kingdom are invited to take part. This article describes the baseline results of one such national quality improvement initiative conducted in 2006. This was focused on screening for the metabolic side effects of antipsychotic drugs, and the clinical setting was assertive outreach teams (AOTs): multidisciplinary clinical mental health teams providing care for patients with severe mental illness in the community.

Methods

Sample and Procedures

The POMH invited all UK specialist mental health services to participate in this quality improvement program, beginning with a national audit of screening for the metabolic side effects of antipsychotic drugs in patients treated by AOTs (also known as assertive community treatment teams). Services that agreed to take part were invited to include as many AOTs as wished to participate. Fifty-three AOTs from 21 services chose to take part, representing approximately 25% of eligible services in the United Kingdom. The number of participating AOTs from any one service ranged from 1 to 5.

To reduce the potential for selection bias, services were asked to include in the audit, all the patients under the care of the participating AOTs who met the criterion of having been prescribed antipsychotic drugs during 2005.

Audit Standards

Published consensus statements and evidence-based clinical guidelines addressing screening and monitoring of the metabolic syndrome in people receiving antipsychotic medication were reviewed. From these, we derived the following minimum acceptable standard: all patients prescribed any antipsychotic medication should have their blood pressure, body weight (BMI, waist circumference, or other measures of obesity), serum glucose (or HbA1c), and plasma lipids measured at least once a year. We recognized that waist circumference, as a correlate of visceral adiposity, may be a more accurate measure of cardiovascular risk than BMI, and fasting glucose more reliable as a screening test for diabetes than HbA1c. After careful consideration of the recommendations contained in published consensus statements and guidelines, we took the pragmatic view that evidence of screening using any of these measures was better than no screening at all. Our screening criteria, therefore, were broad.

Questionnaire on Obstacles to Screening

Participating AOTs were invited to complete a questionnaire addressing issues in relation to screening for the metabolic syndrome in people receiving antipsychotic medication. The 21 items were generated by the members of the study group and its expert advisors, based predominantly on their clinical experience, and covered local attitudes to physical health care, the interface with both general medical services and primary care, and perceived practical difficulties (see table 1). The questionnaire was completed at team meetings and represented the consensus view of the multidisciplinary clinical team.

Data Collection

The audit took place during April and May 2006. For each eligible patient, demographic data (age, gender, ethnicity) and the primary ICD-10 diagnostic code were collected from the current clinical records. The names of all regular and when necessary (pro re nata) antipsychotic drugs currently prescribed were recorded, and a calculation was made to determine whether or not the total dose exceeded the licensed daily maximum (ie, high dose); for patients prescribed 2 or more antipsychotics, the percentage of the maximum dose of each (as stated in the Summary of Product Characteristics) was calculated and added together, as is the convention in the United Kingdom.
Prescriptions for combination doses totaling more than 100% were deemed to be high dose. Lastly, the names of all medication other than antipsychotics currently prescribed were noted.

Data on screening of each of the 4 aspects of the metabolic syndrome were collected retrospectively from case notes for the period January 1–December 31 2005: evidence of testing for high blood pressure, obesity, raised blood glucose (or HbA1c), and dyslipidemia. In addition, documented evidence of a known diagnosis of diabetes, hypertension, or disturbed lipid profile during 2005 was noted.

Evidence of compliance with the audit standard was collected using 3 categories for each of the 4 aspects of the metabolic syndrome: (1) a patient’s case notes included a recorded test result/measurement; (2) there was some reference to screening in the 12-month audit period (eg, “blood pressure taken” was noted) but no result was documented; and (3) there was no reference to any screening.

Each service was allocated a code known only to itself and the POMH team. Services allocated their own codes to individual participating AOTs; keys to these codes were not known to POMH. The coded data were submitted to POMH via secure Web-based forms.

**Data Analysis**

The extent to which services met the audit standard of annual screening for the 4 elements of the metabolic syndrome was categorized using the criteria described above. Each of the 4 aspects of the metabolic syndrome was examined separately to determine whether some aspects were more frequently screened than others, either for all patients or differentially for some patient groups. Data were analyzed at 3 levels for feedback to participants.
The total national data set was analyzed to describe the sample's demographic and clinical characteristics and the extent of screening across the total sample; (2) individual service's data sets were analyzed to allow benchmarking of practice against other services and the total national sample; and (3) the data for each AOT were analyzed to allow benchmarking of practice against other teams within the same service, the service as a whole and the total national sample. Only level 1 analyses are reported here to preserve anonymity, as agreed with services before they took part.

**Results**

All 53 participating AOTs completed the questionnaire, and the responses are provided in table 1. Forty-eight of the AOTs submitted data for 1966 patients under their care. Six of the 48 teams (12.5%) were not able to achieve the 100% audit sample requested, and therefore audited a random sample of available clinical records, ranging from 24% to 87% of eligible patients. The age distribution of the total national sample is shown in figure 1. There were 1616 (82%) patients with F20–F29 (psychotic spectrum disorders) diagnoses, 260 (13%) with F30–F39 (mood spectrum disorder) diagnoses, 26 (1.5%) with F10–F19 (illness due to substance use) diagnoses, 28 (1.5%) with other psychiatric diagnoses, and 36 (2%) for whom the diagnosis was not known.

A measurement or test result was recorded in the clinical records in the previous year for blood pressure in 26% of patients, for BMI (or other obesity measure) in 17%, for plasma glucose (or HbA1c) in 28%, and for plasma lipids in 22% (see figure 2). Results for all 4 measures were documented in the case notes for 11% of patients overall, although the figure varied across the 21 services from 40% to 0%. The likelihood of screening for all 4 aspects of the metabolic syndrome showed only a modest increase with advancing age: the proportion of patients screened in the age bands 16–25, 26–35, 36–45, 46–55, 56–56, and 66 years of age and over were 7%, 8%, 12%, 15%, 13%, and 19%, respectively. Screening for all 4 aspects was recorded in 12% of patients with ICD-10 F20–F29 (psychotic spectrum disorders) diagnoses, the same proportion of those with F10–F19 (illness due to substance use) diagnoses, and 7% of patients with F30–F39 (mood spectrum disorder) diagnoses. The number of patients with other diagnoses was too small to allow meaningful comparisons. With regard to medication variables, screening for all 4 aspects of the metabolic syndrome was recorded in 18% of those prescribed clozapine compared with 9% of those prescribed other SGAs, 10% and 8% of those prescribed depot or oral FGAs, respectively, 10% of those prescribed more than one antipsychotic and 8% of those prescribed a high dose of antipsychotic medication.

Of the total national sample, 121 (6%) of the patients had a diagnosis of diabetes, 120 (6%) dyslipidemia, and 116 (6%) hypertension. Table 2 shows that patients with an established diagnosis of diabetes, dyslipidemia and/or hypertension were more likely to have been tested within the past year than those with none of these diagnoses. Of the patients with a known diagnosis of diabetes, there was no record of medication being prescribed to treat this condition in 46 (38%). Of those with a diagnosis of dyslipidemia, there was no record of medication being prescribed to treat this in 76 (63%), while of those with
hypertension, there was no record of antihypertensive medication being prescribed in 60 (52%).

Discussion

Our findings reveal that in AOTs in the United Kingdom, the rates of screening for the metabolic syndrome in people prescribed antipsychotic medication are well below those recommended. AOTs are services with relatively intensive casework: the patients are those who have proved difficult to engage with both primary care and general adult mental health services and therefore are likely to receive the bulk of their medical care through mental health services. Thus, the low rates of screening are unlikely to be explicable on the basis that screening is assumed by the AOTs to be being carried out in primary care, or elsewhere in the health care system. That the AOTs participating in this survey were self-selected may also be relevant to the generalizability of the findings to other AOTs and possibly other community mental health teams in the United Kingdom. For example, the screening rates reported would be an underestimate of routine practice if there had been selective participation of teams that had recognized their need to improve in this area. However, given the large sample size, such systematic bias seems unlikely.

Although blood pressure and obesity are relatively simple and easy to measure, the screening rates over the year for these variables were no better than those for tests requiring blood samples. The rate of screening for the metabolic syndrome increased modestly with advancing age, which may indicate an increased awareness of the physical risks in older patients. In relation to medication variables, screening was carried out rather more frequently in those receiving clozapine than other antipsychotic agents that may reflect concern related to the side effect profile of the drug as well as the opportunity for blood samples afforded by the monitoring systems in place as part of the prescription of the drug.

One known diagnosis of diabetes, dyslipidemia, or hypertension was associated with a higher rate of screening for all aspects of the metabolic syndrome. However, there was a mismatch between such diagnoses and a record of appropriate drug treatment. While all these conditions, if mild, can be treated by nonpharmacological interventions such as altering diet and increasing exercise, it is unlikely that this fully explains the discrepancy between the number of cases diagnosed and the number receiving specific drug treatment.

One implication of the relatively low level of screening is that pathology with potentially serious consequences is not detected and treated. In the Clinical Antipsychotic Trials of Intervention Effectiveness study, where fasting or random plasma glucose was measured in 689 people with schizophrenia, 13% were found to have diabetes.

Table 2. Percentage of Patients with Diagnoses of Diabetes and/or Hypertension and/or Dyslipidemia Who Were Screened for Each of 4 Aspects of Metabolic Syndrome

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Blood Pressure Screening (%)</th>
<th>Obesity Screening (%)</th>
<th>Glycemic Control Screening (%)</th>
<th>Lipid Profile Screening (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One diagnosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes (n = 60)</td>
<td>37</td>
<td>23</td>
<td>50</td>
<td>32</td>
</tr>
<tr>
<td>Hypertension (n = 53)</td>
<td>55</td>
<td>32</td>
<td>45</td>
<td>34</td>
</tr>
<tr>
<td>Dyslipidemia (n = 63)</td>
<td>60</td>
<td>48</td>
<td>78</td>
<td>84</td>
</tr>
<tr>
<td>Two diagnoses (n = 56)</td>
<td>54</td>
<td>34</td>
<td>50</td>
<td>41</td>
</tr>
<tr>
<td>Three diagnoses (n = 23)</td>
<td>43</td>
<td>35</td>
<td>57</td>
<td>39</td>
</tr>
</tbody>
</table>
Three studies that have directly measured fasting or random plasma glucose in people who had schizophrenia and/or were treated with antipsychotic drugs, and who were not known to be diabetic prior to testing, found that 6% met the diagnostic criteria for diabetes.\(^{16,31,38}\) In our total national sample, 6% had a diagnosis of diabetes, and thus it is likely that for each of these patients, another has diabetes that has not yet been diagnosed. A similar calculation can be made with regard to hypertension. Blood pressure has been directly measured in 2 large studies of people with schizophrenia.\(^{7,39}\) In the first, 27% were found to have hypertension and in the second the figure was 36%. In our total national sample, 6% had a diagnosis of hypertension, and thus it is likely that for every patient with a diagnosis of hypertension, another 4 have not yet been diagnosed. Studies in which plasma lipids have been directly measured in people with schizophrenia and/or treated with antipsychotic drugs have found the prevalence of dyslipidemias to be at least 50%\(^{16,30,37}\). This proportion is not clearly different to that found in the general population. In our total national sample, 6% had a diagnosis of dyslipidemia, and thus it is likely that for every patient with a known diagnosis of dyslipidemia another 7 have a dyslipidemia that has not yet been identified.

The responses to the questionnaire yielded information on a series of obstacles to screening in routine practice in AOTs. For example, about a third of participating teams expressed uncertainty as to whether such physical health screening was the responsibility of the psychiatric team rather than, e.g., a primary care clinician, and less than half of the teams were confident about the interpretation of abnormal screening results. Also, limited access to basic equipment such as a tape measure and weighing scales was a relatively common problem. To address these and other barriers identified by the questionnaire, strategies to increase the level of screening for the metabolic syndrome in clinical practice will need to include educational interventions, provision of appropriate equipment,\(^{40,41}\) and collaborations with primary care physicians, diabetes specialists, dieticians, and others.\(^{24}\)

The participating services received prompt feedback of the audit findings for each of their own AOTs, benchmarked against other services nationally, and the total national sample. Subsequently, we used the audit findings and the responses to the questionnaire to inform the development of a range of change interventions that were offered to participating services in the year following the baseline audit. A repeat audit is planned to see whether consideration of the benchmarked data and the implementation of the change interventions locally has had any impact on the profile and frequency of screening.

Acknowledgments

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References


