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ORIGINAL RESEARCH

A health screening and promotion clinic to improve metabolic monitoring for patients prescribed antipsychotic medication

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Objectives. We sought to determine whether the introduction of a health screening and promotion clinic might serve as a useful addition to existing services for patients prescribed antipsychotic medication. In particular, we wished to assess whether such a clinic might improve adherence to best practice guidelines. We also wished to determine the level of patient interest in such a clinic and how readily this service might be provided within the constraints of existing clinical resources.

Methods. We conducted an audit of outpatient records before and following the introduction of a health screening and promotion clinic.

Results. Of the eligible patients, 73% attended the clinic. The proportion of patients who had fasting blood tests within the previous 12 months increased from 45% at baseline to 85% at follow-up ($\chi^2 = 14.1$, $p < 0.001$). The proportion of patients with appropriate physical observations completed increased from 5% at baseline to 80% at follow-up ($\chi^2 = 46.0$, $p < 0.001$).

Conclusions. We found that the introduction of a health screening and promotion clinic improved adherence to best practice guidelines. This service was well received and readily provided within the constraints of existing resources. Ultimately, the structure of services to screen and advise patients prescribed antipsychotic medication will be determined by local resource considerations and configuration of services.

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Key words: Antipsychotic medication, health screening, metabolic monitoring.

Introduction

Patients with schizophrenia have ~2.5 times the risk of dying compared with the general population (Saha *et al*. 2007). A study conducted in the Irish context reported a two-fold increase in mortality (Morgan *et al*. 2003). Suicide contributes to this increased mortality rate; however, a recent longitudinal study of a community cohort of 370 patients with schizophrenia in the United Kingdom found that ~81% of the excess mortality was from natural causes (Brown *et al*. 2010). The most significant contributions to this excess mortality came from circulatory and respiratory diseases. One meta-analysis reported that the differential mortality gap for patients with schizophrenia compared with community controls has increased in a linear manner over the last three decades (Saha *et al*. 2007). Case fatality rates for patients with schizophrenia were reported to have remained constant compared with declining mortality rates in the general population, suggesting that patients with schizophrenia have failed to benefit from the improvements in health outcomes available to the general population (Saha *et al*. 2007). The excess mortality also extends to patients with bipolar disorder, depression and substance-use disorders, although a recent analysis reported that the lowest life expectancies are for men with schizophrenia and women with schizoaffective disorder (Chang *et al*. 2011).

The reasons for this are several-fold and likely include a range of lifestyle, disease-related and treatment-related factors. Patients with schizophrenia are less likely to exercise and are more likely to eat diets high in fat and low in fibre (Brown *et al*. 1999; McCreadie, 2003). They are also more likely to smoke, abuse alcohol and take illicit substances (Goldman, 1999). In one longitudinal study of patients with schizophrenia, it has been estimated that smoking-related diseases accounted for 70% of the excess natural mortality (Brown *et al*. 2010). It has also been reported that schizophrenia itself, independent of lifestyle and treatment-related factors, may be associated with an increased risk of metabolic

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syndrome and diabetes (Dinan, 2004; Thakore, 2004). Patients with schizophrenia are less likely to receive routine health check ups in primary care (Roberts *et al*. 2007), and health-care inequalities persist following detection of medical conditions such as cardiac disease and diabetes (Frayne *et al*. 2005; Laursen *et al*. 2009). Antipsychotic medication has been associated with a significantly reduced risk of suicide in patients (Tiihonen *et al*. 2006), but there is also evidence that antipsychotic medications, particularly atypical medications, are associated with increased risks of weight gain, dyslipidaemia and alterations in glucose homeostasis (Newcomer, 2007).

Antipsychotic medication is ordinarily prescribed, following careful consideration of the risks and benefits in each case (NICE, 2009). The prescribing psychiatrist remains the clinician-best positioned to make this choice, and several countries now have guidelines in place regarding monitoring for metabolic side effects before and after initiation of treatment (Cohn & Sernyak, 2006). However, an audit of mental health services across the United Kingdom in 2007 reported poor adherence to best practice guidelines (Barnes *et al*. 2007). Clinicians reported barriers to care such as: uncertainty regarding whose responsibility it is, limited access to equipment and lack of confidence in interpretation of results. More recently, it has been reported that health screening clinics may help overcome these barriers and may serve as a useful adjunct to opportunistic screening alone (Millar, 2010). Therefore, we sought to determine whether the introduction of a health screening and promotion clinic might serve as a useful addition to existing services for patients prescribed antipsychotic medication. In particular, we wished to determine whether such a clinic might improve adherence to best practice guidelines. We also wished to determine the level of patient interest in such a clinic and how readily this service might be provided within the constraints of limited clinical resources.

Methods

Sample

A register of all patients, currently prescribed antipsychotic medication attached to the sectoral clinic of a public mental health team in an urban catchment area, was compiled (103 patients). Only outpatients who could physically attend the clinic were included. Current inpatients and those in nursing home care were excluded and alternate care arrangements were made (10 patients). Similarly, patients who were prescribed Clozapine were excluded, given that they already benefit from comprehensive monitoring of metabolic risk factors in a centrally located Clozapine clinic (8 patients). This left a sample of 85 patients who might benefit from and could attend the clinic. Data were collected retrospectively from clinical records. A form of random sample selection was achieved by selecting every third file in alphabetical order from a patient list until a sample of 40 patient records had been selected. An audit was conducted at baseline and 3 months after the introduction of the health screening and promotion clinic. A similar random selection procedure was used at follow-up to collect a different sample of 40 patient records.

Measures

Data were collected retrospectively using a data collection tool from patients' clinical records. Data regarding the following standards of care were collected from the clinical records. The multidisciplinary team adopted the Maudsley prescribing guidelines for monitoring of antipsychotic medication as the standard of care (Taylor *et al*. 2010). This guideline recommends that a number of blood tests (full blood count, renal, liver function tests, fasting lipid profile, glucose and prolactin), physical observations (weight, blood pressure and body mass index and waist measurement) and an electrocardiography (ECG) should be conducted before commencing antipsychotic medication. Fasting lipid profile and glucose should be repeated 3 months after initiation and at least annually thereafter, along with other observations and tests as listed above according to the clinical circumstances. Given the periodic nature of the clinic we determined, as a minimum standard, to assess whether relevant bloods tests and observations had been completed within the previous 12 months (both at baseline and follow-up), and whether an ECG had been completed at any time in the past. It was also agreed that each patient should be given advice regarding the risks and benefits of antipsychotic medication, including metabolic side effects, and that this should be documented in the clinical records as per current NICE guidance (NICE, 2009).

Health screening and promotion clinic

Two team members (C.Y. and D.G.) were delegated responsibility for the health screening and promotion clinic, although all participated in the design and running of the clinic. A register of all patients, currently being prescribed antipsychotic medication, was created. A letter was sent to all eligible patients inviting them to attend the clinic, which was held on two separate mornings. On arrival at the clinic, patients had physical observations including height, weight, BMI and waist measurement completed by a member of nursing staff. Details regarding medical history, medication and lifestyle factors (smoking, alcohol, etc.) were recorded during a consultation with

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the doctor. Patients were given written information and advice regarding healthy lifestyle habits, with particular emphasis on any identified risk factors such as dyslipidaemia, obesity, smoking and exercise. Patients were also advised regarding the potential metabolic side effects of antipsychotic medication and how to manage this. Patients were referred for fasting blood tests and/or an ECG where required. In circumstances where investigations had recently been completed by the patient's GP, a copy of these results was requested and filed in their outpatient record. In circumstances where there was sufficient clinical information, it was possible to calculate the patient's 10-year cardiovascular risk using a web-based calculator, on the basis of the Joint British Societies risk calculation charts (Cardiovascular Risk Calculator, 2011). This allowed the doctor to represent graphically to the patient how a change in lifestyle might have a positive impact on their risk of incident cardiovascular disease. Patients with abnormal results or observations were directed to attend their GP for follow-up, together with a copy of the completed investigations. All of the above information was documented on a pro-forma checklist, which was filed in the patient's record for ease of reference at future consultations.

Analysis

Statistical analyses were performed with Stata 12. Student's *t*-test was used for continuous data and Pearson's χ^2-test for dichotomous data as appropriate. A nominal significance level of $\alpha = 0.05$ was used.

Results

A total of 85 patients on antipsychotic medication were identified for screening. All eligible patients were invited to attend the clinic. Sixty-two (73%) patients attended the clinic, whereas 7 (8%) refused and 16 (19%) did not attend. A random sample of 40 patient records was examined before and after the introduction of the clinic to determine adherence to practice guidelines. Summaries of socio-demographic and medical details regarding the patient samples before and after the intervention are outlined in Table 1. The two samples did not differ significantly according to socio-demographic and clinical characteristics. The majority of patients had a diagnosis of either schizophrenia or bipolar disorder and most patients were prescribed atypical antipsychotic medications.

Blood tests and physical observations

The clinic intervention resulted in a significant improvement in completion of appropriate blood tests and physical observations as per current guidelines (Table 2). We also measured blood pressure to allow more accurate assessment of cardiovascular risk, and this was recorded in 32 (80%) patients at follow-up compared with 1 (2.5%) at baseline ($\chi^2 = 46.0$, $p < 0.001$).

ECGs

At baseline, 4 (10%) patients had an ECG in their outpatient clinical notes (completed at any time in the

Table 2. *Proportion of patients with blood tests and observations completed in the previous 12 months before and after the clinic intervention*

	Audit ($n = 40$)	Re-audit ($n = 40$)	χ^2	p
Height [n (%)]	0 (0)	32 (80)	53.3	<0.001
Waist [n (%)]	0 (0)	31 (78)	50.6	<0.001
Weight [n (%)]	1 (2.5)	32 (80)	49.6	<0.001
Cholesterol [n (%)]	21 (52.5)	34 (85)	9.83	0.002
Glucose [n (%)]	18 (45)	34 (85)	14.1	<0.001

Table 1. *Summary of demographic and clinical characteristics of the initial patient sample and follow-up sample, following the clinic intervention*

	Audit ($n = 40$)	Re-audit ($n = 40$)	χ^2/t	p
Age (mean, S.D.)	46.9 (12.8)	48.9 (12.4)	−0.74	0.45
Female gender [n (%)]	18 (45)	18 (45)	0.0	1.0
Primary diagnosis				
Schizophrenia [n (%)]	19 (47.5)	20 (50)	0.05	0.82
Bipolar affective disorder [n (%)]	9 (22.5)	11 (27.5)	0.27	0.61
Depression [n (%)]	4 (10)	1 (2.5)	1.92	0.17
Anxiety disorder [n (%)]	5 (12.5)	4 (10)	0.13	0.72
Other [n (%)]	3 (7.5)	4 (10)	0.16	0.69
FGA [n (%)]	8 (20)	6 (15)	0.35	0.56
SGA [n (%)]	36 (90)	37 (92.5)	0.16	0.69

FGA, first-generation antipsychotics; SGA, second-generation antipsychotics.

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past). Five (12.5%) patients were prescribed high-dose antipsychotic medication, but none had an ECG in their outpatient clinical notes. At follow-up, 21 (52.5%) patients had an up-to-date ECG in their medical records ($\chi^2 = 13.1$, $p < 0.001$). One (2.5%) patient at follow-up was prescribed high-dose antipsychotic medication and had a current ECG in their medical records.

Advice and documentation

At baseline, 12 (30%) patients had the fact that they had been given advice regarding the potential metabolic side effects of antipsychotic medication documented in their clinical records. At follow-up, 33 (82.5%) patients had been given such advice and this was documented in their medical records ($\chi^2 = 22.4$, $p < 0.001$). At baseline, one (2.5%) patient had been requested to attend for fasting blood tests but had refused. At follow-up, it was now documented in all instances, except one, that the patient had either been offered a health screening and promotion clinic appointment and had not attended, or had attended and failed to undertake the relevant investigations requested.

Discussion

In this study, we found that the introduction of a health screening and promotion clinic improved adherence to best practice guidelines. We also found that we were able to screen our patient population in an expeditious and efficient manner, with minimal additional demand on constrained nursing and medical resources. Patient interest in such a service was good, with 73% of eligible patients attending the clinic. This compared well with an attendance rate of 80% for two general psychiatry clinics held over the same period. Importantly, the creation of a patient register allowed for the systematic identification and follow-up of patients who did not attend. Given that the second audit was completed only 3 months after the initiation of the clinic, it is likely that a greater proportion of patients had outpatient investigations completed over the following months. Of the patients on antipsychotic medication, 100%, who were eligible for screening, were offered an appointment to attend for health screening and this has been documented in the patient record.

The health screening and promotion clinic as described above does have a number of limitations and does not relieve the prescriber of the responsibility to conduct metabolic screening at baseline and in the early follow-up period. The level of adherence to screening at baseline and at 3-month follow-up is not described and could not be adequately addressed by a clinic held at infrequent intervals. Of the patients, 27% did not attend the clinic, and therefore these patients must be followed up opportunistically. The clinic is therefore best considered as a complementary rather than an alternative approach to opportunistic screening. In addition, this study was conducted in the context of an urban, generally lower middle class, outpatient population, and thus the same assumptions regarding attendance and level of patient engagement may not be readily extrapolated to other populations. It is also noteworthy that far fewer patients attended for ECGs than blood tests. This may reflect increased difficulty in accessing ECG services, which were located separately to the phlebotomy department at the local general hospital. The above analysis is limited by a small sample size, and data were not collected from the entire study population. It is therefore possible that the two samples may have differed in some ways not accounted for in this analysis, which had an impact on the care received. However, the random selection procedure and the absence of significant differences according to several socio-demographic and clinical variables offer some reassurance in this regard. It would be advisable to replicate findings in larger samples of different socio-demographic origins over a longer duration of follow-up.

Nonetheless, we felt that the health screening and promotion clinic offered a number of advantages above opportunistic screening alone. These included designating lead team members to take responsibility for the compilation and maintenance of an accurate register of patients currently prescribed antipsychotic medication. This facilitated the systematic identification and screening of patients as outlined above. We also found that the clinic served as useful forum for the transfer of skills between lead team members and those less familiar with the principles of primary and secondary prevention in cardiovascular disease. The clinic was able to focus exclusively on the general physical health of the patient, and therefore allowed for a more comprehensive and standardised evaluation than might ordinarily occur in the course of a routine consultation. In certain instances, we were able to demonstrate graphically to the patient, using cardiovascular risk calculators, how a change in lifestyle might have a positive impact on their risk of incident cardiovascular disease. Importantly, the clinic served as a failsafe measure to ensure appropriate documentation and adherence to best practice guidelines. This may be of particular relevance in services where increased demands and short consultation times make management of anything other than more immediate psychiatric complaints challenging. In circumstances where staff are temporary or are not engaged in professional training, it may prove equally

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challenging to ensure delivery of a standardised service without additional oversight.

There are a number of ways in which the services of such a clinic might be developed. In general, we found that the clinic was well received by patients who were pleased to engage with team members on matters of general physical health outside of the context of a crisis presentation or exacerbation of psychiatric symptoms. However, we did not evaluate patient satisfaction in a formal or structured way and this should be addressed at a future date. The clinic was provided with minimal additional demand upon existing resources, and it is possible that such a clinic might be led by an advanced nurse practitioner with input from medical practitioners only as required. It might also be possible to provide more intensive, tailored interventions with on-site screening for individuals at higher risk. The creation of a database of patients at increased risk of medical co-morbidity would facilitate further research regarding mechanisms and pathways to poor physical health in patients with mental illness. The impact of various health screening and promotion interventions on physical and mental health outcomes must also be evaluated to determine their relative worth.

The success of such a clinic in improving the physical health of patients with mental illness is necessarily determined by successful integration, with services in primary and secondary care. However, disparities in medical care for patients with major mental illness have been reported from other jurisdictions. Patients with schizophrenia in the United Kingdom have been reported to be less likely to have blood pressure or cholesterol recorded in primary care compared with general population controls (Roberts *et al*. 2007). A population-based cohort study of 4.6 million individuals in Denmark found that patients with major mental illness had only a marginally increased incidence of cardiac disease compared with community controls, but were far less likely to undergo cardiac procedures with an almost three-fold mortality rate at 5 years (Laursen *et al*. 2009). There are few data in the Irish context regarding the general medical care of patients with mental illness. It is known that patients attending mental health services are more likely to have attended their general practitioner for a physical health problem in the previous year (Tedstone Doherty *et al*. 2008). However, there is little information regarding care needs or care received. Therefore, further information is required regarding the burden of medical co-morbidity and care outcomes for patients with major mental illness in the Irish context. The development of registers for patients with major mental illness in both primary and secondary care may facilitate more accurate description of the challenges to be considered. There is now increasing evidence for novel approaches to care. A case-management approach has been shown to improve patient engagement with general medical services and to reduce cardiovascular risk (Druss *et al*. 2010). The integration of general medical and psychiatric services on one site can improve access to care, although this may not be practical in every instance (Druss *et al*. 2001). Ultimately, the optimal model of care may vary according to local needs, existing standards of care and service agreements.

In conclusion, we found that the introduction of a health screening and promotion clinic improved adherence to best practice guidelines regarding metabolic screening for patients prescribed antipsychotic medication. This service was well received and readily provided within the constraints of existing clinical resources. Ultimately, the format and structure of services to screen and advise patients prescribed antipsychotic medication will be determined by local considerations. However, it may be that, in many instances, a health screening and promotion clinic may serve as a useful addition to existing services and may be a valuable link in the chain of services required to improve standards of general medical care for patients with mental illness.

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