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A survey of monitoring of weight and blood glucose in in-patients

AIMS AND METHOD

The aim of this survey was to look at current practice in monitoring weight and glucose control in in-patients being prescribed antipsychotic medications. Records for 51 patients admitted with psychotic illnesses to a large teaching hospital during a 3-month interval were surveyed.

RESULTS

Fifty-five per cent of patients had no record of weight taken on admission to hospital. Only one patient had their weight repeated during the admission. Forty-nine per cent of patients had random blood glucose checked on admission. No fasting levels were performed.

CLINICAL IMPLICATIONS

Weight gain and hyperglycaemia associated with antipsychotic prescription are well-recognised side-effects. These results suggest that standardisation of weight measurement and blood glucose monitoring is required.

Half of patients on long-term antipsychotic therapy, both typical and atypical, experience weight gain as a side-effect (Baptista, 1999). This is a phenomenon shared with many other psychotropic agents. The tendency of atypical antipsychotics, in particular clozapine and olanzapine, to induce weight gain to a larger extent than that of the conventional agents has renewed interest in this area (Kurzthaler & Fleischhacker, 2001). It must be noted that there is marked variation between individuals in experiencing weight gain as a side-effect.

Mean weight gains with atypical agents range from 0.04 kg with ziprasidone to 4.45 kg with clozapine at 10 weeks (Allison *et al*, 1999). Weight gain has been described as 'one of the most distressing side-effects of antipsychotic medication' (Fakhoury *et al*, 2001). Increased morbidity and mortality in association with being overweight is well established. In addition, people with schizophrenia have higher rates of morbidity and mortality than the general population (Brown & Barraclough, 2000).

Abnormalities in glucose regulation occur more commonly in individuals with schizophrenia than in the general population. Treatment with antipsychotic medications, both typical and atypical, is associated with impaired glucose metabolism, exacerbation of existing type 1 and type 2 diabetes, and new onset of type 2 diabetes mellitus and diabetic ketoacidosis (Haupt & Newcomer, 2001).

It has been suggested that screening measures, including recording baseline weight and monitoring blood glucose control, should be introduced prior to initiating and during prescription of antipsychotic therapy (Kurzthaler & Fleischhacker, 2001). We aimed to survey current practice in relation to monitoring of weight and blood glucose prior to initiation and during prescription of antipsychotic medication in an in-patient setting.

Method

A list of all patients with an ICD-10 diagnosis of schizophrenia (World Health Organization, 1992), schizoaffective disorder, persistent delusional disorder,

acute and transient psychotic disorder or induced delusional disorder admitted to acute general adult wards in The Royal Cornhill Hospital from the beginning of January 2001 to the end of March 2001 was obtained from medical records. In accordance with local policy, consent was sought from the individual patient's responsible medical officer prior to accessing the case notes.

Case notes were reviewed, looking for any recordings of weight, during the index admission and in the year thereafter. A record of blood glucose was sought in both the case notes and from the regional laboratory computer database at the point of admission. If the random glucose was noted to be elevated (levels were deemed to be elevated if greater than or equal to 10 mmol/l), a further search was made for subsequent checks during the admission.

Results

Sixty-one patients with the specified diagnoses were admitted to general adult wards during the 3-month study period. Consent to examine the medical record was obtained from the responsible medical officer for 50 of the cases. Six sets of those patients' case notes were unavailable. Seven of the remaining 44 patients had two admissions to general adult wards during the specified period. Each admission was dealt with individually; this resulted in a data-set of 51 admissions. All patients were prescribed antipsychotic medications.

Weight

Twenty-two of the 51 admissions (43%) had their weight recorded by nursing staff. Three of these weights were noted in the admission medical examination. One additional weight was recorded by the admitting doctor and not by nursing staff. Two patients had comments 'overweight' and 'slightly overweight' recorded by the admitting doctor, but no corresponding entry of actual weight by nursing or medical staff. For the purpose of analysis, these two qualitative entries are recorded as 'weight not



taken'. In total, 23 of the 51 admissions (45%) had a record of weight kept (Table 1).

While in-patients, 27 individuals were initiated on, or had a change in, antipsychotic medication. Of these 27, 12 (44%) had a record of admission weight.

Case records were hand-searched for the year following the study period to determine whether further entries of weights had been made. Of those with baseline weights ($n=23$) only one had repeated weights taken during admission. This patient was commencing treatment with clozapine. Eleven of the cases had a subsequent entry of weight when they were readmitted. Weight changes ranged from a loss of 22.3 kg to a gain of 6.4 kg. Ten admissions without baseline weights had a subsequent entry of weight. Eight of these were on readmission, one at an out-patient clinic and another recorded in a letter from a dietician to whom they had been referred because of weight gain.

Of the seven cases with two admissions, only two had a weight taken on the first admission with none on the second admission. The remaining five had no record taken on either occasion.

Blood glucose

Twenty-five of the 51 admitted patients (49%) had their random blood glucose checked. Of these 25, two had elevated levels of 10 mmol/l and 12 mmol/l. The patient with a random level of 10 mmol/l had a further random level taken during the admission that was not elevated. No fasting levels were performed on any of the patients. Of the seven cases with two admissions, four had no measurement of glucose on either admission. Two had random glucose levels within the normal range on the first admission but no glucose measurement on readmission. The remaining one had a random record taken on the second admission but no measurement on the first.

Discussion

Weight gain as a side-effect of antipsychotic medication has recently emerged as an area of concern. This side-effect has the potential to impact on both the physical and psychological well-being of the patient. Failure to address this issue might lead to life-threatening medical complications and non-adherence. Evidence of being overweight or having raised blood glucose in a patient

taking an antipsychotic agent does not necessarily mean that the antipsychotic has caused this. Evidence of a change in these parameters that coincided with the introduction of the antipsychotic, however, would be more suggestive of a causal relationship. Standardised monitoring would help to clarify these links.

Despite prompts being present on both the nursing and medical admission records, less than half of all admissions had a record of their weight being taken. This remained the case even when patients were initiated on a new antipsychotic regime. These prompts comprised a specific heading for weight at the top of the medical admission physical examination form and a similar cue on the nursing admission form.

This survey suggests that there is no reliable process in place for recording weight during admission and subsequent to it. For the majority of patients who had a subsequent record of weight, this was on their readmission to hospital rather than at out-patient follow-up. Weight gain most frequently occurs in the first 4–12 weeks of treatment (Wetterling, 2001). However, a further increase has been observed during long-term follow-up (Wetterling, 2001). This would suggest that regular out-patient monitoring would be beneficial.

Hyperglycaemia as an association of antipsychotic treatment, especially with olanzapine and clozapine, has been highlighted. Blood glucose monitoring for all patients commenced on clozapine and olanzapine has been advocated (Mir & Taylor, 2001). Further support for this position comes from the Committee on Safety of

Box 1. Summary of recommendations

- 1 Standardised monitoring of weight and blood glucose should be undertaken for patients receiving antipsychotic medication. (Access to weighing scales and phlebotomy services will be required in in-patient and out-patient settings.)
- 2 Baseline weights to be taken prior to initiation, or change, of antipsychotic treatment.
- 3 Measurement of weight repeated within first 12 weeks of treatment.
- 4 Six-monthly checks of weight thereafter.
- 5 Fasting blood glucose level taken prior to initiation, or change, of antipsychotic treatment.
- 6 Repeat fasting blood glucose after start or change in antipsychotic therapy at an interval of 3 months. In particularly high-risk individuals (obese, smoker, family history of diabetes mellitus or cardiovascular disease), consider obtaining a second fasting plasma glucose level within the first 4 weeks of treatment.
- 7 Annual fasting blood glucose monitoring thereafter.
- 8 Consideration of risk factors for diabetes with closer monitoring of patients in higher-risk categories.

Table 1. Weights recorded among 51 admissions

Weight measurement	<i>n</i> (%)
Weight recorded on admission	
By nursing staff	22 (43)
By medical staff	3 (6)
By nursing or medical staff	23 (45)
Weight recorded following admission	
At any other time during first admission	1 (2)
In following year	21 (41)

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Medicines warning of an association between potentially fatal ketoacidosis and olanzapine (Committee on Safety of Medicines, 2002).

Routine examination of glucose control on all patients treated with antipsychotic medications has been recommended (Haupt & Newcomer, 2001). This can be achieved by taking random blood glucose levels, fasting blood glucose, HbA1c monitoring or performing a glucose tolerance test. Random blood glucose is the least reliable of these measures (Haupt & Newcomer, 2001). Annual checks of fasting blood glucose levels in all patients treated with any antipsychotic medication, as well as assessment of fasting levels prior to commencing an antipsychotic medication, have been advocated (Haupt & Newcomer, 2001).

In this survey, random blood glucose measurements were the only measurement of glucose taken and these were checked haphazardly. In particular, half of the patients initiated on olanzapine and none of those initiated on clozapine had any form of blood glucose measurement taken. When random levels were found to be elevated ($n=2$), no fasting levels were taken.

The Royal Cornhill Hospital is a large teaching hospital, and this survey reflects the work of 14 different teams. Our sample is small and it would be helpful to repeat this survey elsewhere with large numbers. After this survey was completed, the Committee on Safety of Medicines (2002) released a warning on antipsychotic-associated hyperglycaemia with olanzapine; monitoring of this parameter may have improved as a consequence of this warning.

This survey appears to provide evidence of the need for standardisation of weight measurement and blood glucose monitoring in this vulnerable group of patients. Such monitoring would allow for early management of side-effects and/or a change in medication.

Declaration of interest

None.

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