Are blood pressure, blood glucose and weight being monitored in patients taking olanzapine?

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Background

90% of patients gain **3.3Kg weight** within 8 weeks of taking olanzapine. This is an increase in body fat not water content.[1]

Schizophrenia is associated with abnormalities in glucose regulation. This is further exacerbated by antipsychotics, causing impaired glucose metabolism, exacerbation of type I and type II diabetes mellitus, increased rates of type II diabetes mellitus and diabetic ketoacidosis.[2]

Incidence of **diabetes mellitus** increases from **4.4 per 1000** in patients taking any class of antipsychotic for schizophrenia, to **10 per 1000** in those specifically taking olanzapine. [3]

Increased abdominal fat, measured by waist circumference, is a positive predictor of coronary artery disease and type II diabetes mellitus.[9]

Hypertension is also associated with olanzapine use.[4]

An increase in morbidity and mortality, particularly from cardiovascular disease, is associated with olanzapine use.[1,5]

National Institute for health and Clinical Excellence (NICE), and the Maudsley prescribing guidelines, recommend that blood pressure, blood glucose and weight should all be monitored regularly in patients taking olanzapine.[6,7]

Methodology

The audit was undertaken in January 2008, and the re-audit in July 2008, at the Early Intervention Service (EIS) in Birmingham. Consent was gained from the team managers. Criteria and standards were set according to the NICE and Maudsley Prescribing Guidelines and are shown in the table below.

The EIS is divided into regions, and teams from each provided a list of all patients under their care. We searched all the patient drug charts to ascertain who was prescribed olanzapine. We then searched corresponding patient notes for records of blood pressure, blood glucose and weight, as well as height, body mass index (BMI) and waist circumference. The evidence of these were divided into time periods of: at baseline (commencement of olanzapine), 3 months, 6 months and 12 months following commencement of olanzapine. Analysis of the data accounted for patients that stopped taking olanzapine before 12 months.

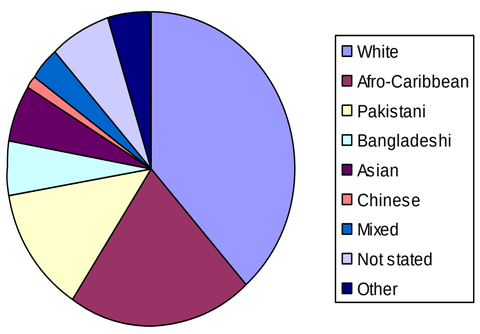
The data was analysed after the primary audit, presented to the EIS with recommendations, and the re-audit took place 6 months later in July 2008.

The data was analysed using Microsoft Excel and a paired t-test was used to compare the data between the primary audit and re-audit.

Criteria & Standards

Criteria	Target Set Standards (100%)
Full patient and family history, including documentation of diabetic history and cardiovascular risk	100
Body weight (Kg) and BMI recorded at baseline, 3 months, 6 months and 12 months	90
Waist circumference recorded at baseline, 3 months, 6 months and 12 months	90
Blood pressure recorded baseline, 3 months, 6 months and 12 months	90
Blood glucose at baseline, 3 months, 6 months and 12 months	80

Demographics



Results

A total of 101 patients were included in the primary audit. 86 (85%) of these patients were audited. The remaining 15% were not audited as the patient notes were not available, due to being in use and not accessible at the time of audit.

39% of patients were of Afro-Caribbean or Asian origin. It has been shown that people of these ethnicities living in the UK are at least 5 times more likely to develop diabetes.[8]

Results showed that follow-up recordings had poorer results than earlier recordings, hence monitoring at the baseline or 3 months were higher than at 6 or 12 months.

There were large variations between the different departments within the Early Intervention Service as described below:

The **South** region had the best and most consistent results. BP, glucose and weight were measured in 42.3% of patients at the baseline, however decreased to 5.6% of patients by 12 months.

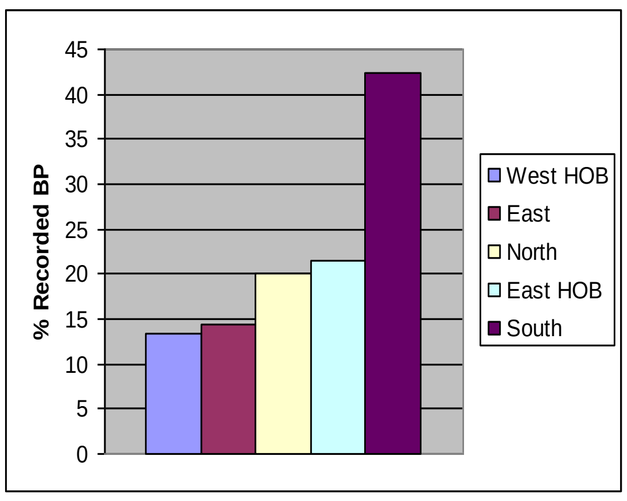
The **East** region showed consistent results ranging between 5-15% between the baseline recordings, 3 months and 6 months, with no recordings at 12 months in most measures.

The East and West **Heart of Birmingham** (HOB) showed the poorest results. Glucose was recorded most frequently, with a highest glucose recording of 36.4% at 12 months in West HOB and 35.7% at baseline in East HOB. The remainder of the results were extremely poor with the majority of height, weight, BMI and waist circumference scoring 0% in both East and West HOB.

The **North** region showed consistent but poor results at 3 months, with recordings of 22.2% of most the measures. There were no recordings at 6 months or 12 months.

Across the regions, BP, glucose and weight were recorded most frequently, with BP recorded the most. The results of BP recordings between the different departments are shown in the graph below.

Baseline BP Results



Summary of Results

	Baseline (%)	3 Months (%)	6 Months (%)	12 Months (%)
Height	8.24	12.82	2.12	1.8
Weight	11.32	14.74	4.66	2.92
BMI	2.5	5.66	3.66	1.8
Waist circ.	1.9	7.6	2.66	0
BP	22.26	17.6	7.66	5.78
Glucose	19.9	16.94	5.76	9.58

Recommendations

Increase awareness of the importance of physical monitoring in patients taking olanzapine and the implications on patients' health.

Undertake a full physical examination when commencing olanzapine, including BP, glucose, weight, height, and waist circumference.

BP, glucose and weight should also be measured at 3, 6 and at 12 months after commencing olanzapine, and annually thereafter. Monitoring may be stopped after cessation of olanzapine, at the discretion of the clinician.

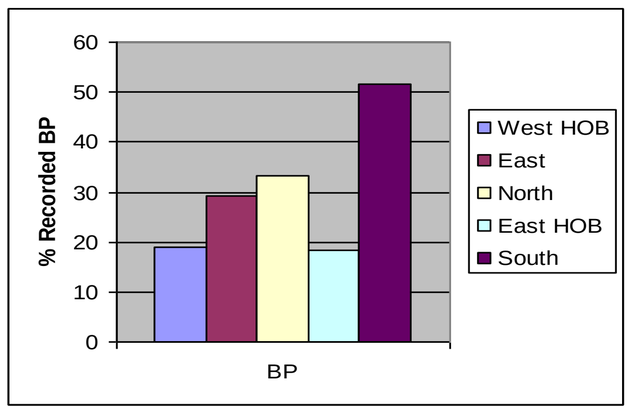
Recommendation of using a **standardised recording chart**, including personal details of the patient and recordings of physical measures mentioned at the time intervals stated.

Provide equipment for physical reviews, such as weighing scales, tape measures, sphygmomanometers, blood glucose monitors and calculators to calculate the BMI.

Re-audit Results

	Height (%)	Weight (%)	BMI (%)	Waist circum-ference (%)	BP (%)	Glucose (%)
Primary audit mean	6.25	8.41	3.41	3.04	13.33	13.05
Re-audit	24.54	25.80	23.40	25.80	30.28	9.16
% increase	18.29	17.39	19.99	22.76	16.95	-3.89

Re-audit BP Results



Results by Area

Criteria measured	Target standard (%)	South (%)	East (%)	North (%)	East HOB (%)	West HOB (%)
History	100	100	100	100	100	100
Height	90	58.6 (n=17)	29.2 (n=5)	16.7 (n=1)	18.2 (n=2)	0
Weight	90	58.6 (n=17)	29.2 (n=5)	16.7 (n=1)	18.2 (n=2)	6.3 (n=1)
BMI	90	58.6 (n=17)	23.5 (n=4)	16.7 (n=1)	18.2 (n=2)	0
Waist circum-ference	80	58.6 (n=16)	29.2 (n=5)	16.7 (n=1)	18.2 (n=2)	6.3 (n=1)
BP	90	51.7 (n=15)	29.2 (n=5)	33.3 (n=2)	18.2 (n=2)	19.0 (n=3)
Glucose	80	27.5 (n=8)	12.0 (n=2)	0	0	6.3 (n=1)*
p =		0.003	0.0004	0.03	0.07	0.2

Discussion

90% patients gain weight taking olanzapine.[1] Incidence of glucose intolerance and diabetes increases with olanzapine compared to other antipsychotic medications.[3] Hypertension is also a known side effect of olanzapine.[4]

The Maudsley and NICE guidelines recommend monitoring physical health in patients taking olanzapine.[6,7]

86 patients taking olanzapine were audited. Results were poor, showing that blood pressure was recorded the most with an average of only 22% recorded at baseline, with the South area having the highest results.

Recommendations, such as use of a standardised recording chart, were made, and the re-audit took place 6 months after the initial.The re-audit in June 2008, showed a clear increase in monitoring of physical health within all measures, except for glucose monitoring.

The greatest improvements were seen in waist circumference, which during the primary audit had poorer results. The best results still remained with BP monitoring, which increased to 30.28% of patients.

The main limitation of the audit was the small sample size, however, despite this the audit has still produced significant results. Some patient notes were not available for inclusion, causing sampling bias.

The recording chart may be more sensitive in determining the risk of developing complications such as diabetes mellitus especially in patients with a normal BMI as it will detect an increase in intra-abdominal fat by measuring waist circumference.[7]

A large proportion of our sample were of Asian or Afro-Caribbean origin and a link between these ethnicities and type two diabetes mellitus has been proven.[10]

Conclusions

Simple interventional measures provided observable significant results, leading to improvement in the physical health assessment of those suffering from mental health conditions. Further audits are required to assess the continuing progress and development.

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