Original Article

Reducing Polypharmacy Through the Introduction of a Treatment Algorithm: Use of a Treatment Algorithm on the Impact on Polypharmacy

Siow-Ann Chong,[1]*MBBS, M Med*, Nigila Ravichandran,[2]*MBBS*, Lye-Yin Poon,[1]*B Soc Sci (Hon)*, Kai-Ling Soo,[3]*MBBS*, Swadna Verma,[1]*MBBS, MD*

Abstract

Introduction: Polypharmacy is very common in the psychiatric setting despite the lack of evidence to justify its use. The objective of this study was to review the prescription patterns in a tertiary mental health institute in Asia and evaluate the impact of a treatment algorithm for patients with first-episode psychosis (FEP) on the use of polypharmacy. Materials and Methods: A treatment algorithm was implemented for patients accepted into an Early Psychosis Intervention Programme (EPIP) and the prescription patterns of these patients were compared with a comparator group (pre-EPIP) before the use of the algorithm. The prescribing pattern was established at 2 points: at baseline after the diagnosis was made, and 3 months later. Results: There were 68 subjects in the comparator group and 483 EPIP patients; the latter were on the average younger. None in the comparator group was diagnosed to have an affective psychosis. There was a significant reduction in the rate of antipsychotic polypharmacy, prolonged use of benzodiazepines and anticholinergic medication in EPIP patients. This group also had an increase in the use of second-generation antipsychotics and received lower doses of antipsychotics. Conclusion: The implementation of a treatment algorithm coupled with audit has changed the trend towards polypharmacy among patients with FEP.

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Key words: Antipsychotics, Drug use review, Psychosis

Introduction

The use of 2 or more antipsychotic medications (polypharmacy) for an episode of psychosis is pervasive despite the lack of evidence-based data.[1,2] It is also associated with higher daily dosing, more frequent use of adjunctive medications such as anticholinergic agents,[3] higher rate of adverse effects and under-utilisation of atypical antipsychotic medications, and possibly greater costs.[4,5]

Polypharmacy among Asian patients with psychosis is common, ranging from 12% in Hong Kong to 78% in Japan.[6] It has even been suggested that polypharmacy in Asia is related to the principles of Oriental traditional medicine, in which the best prescriptions include a mixture of various ingredients.[7] In a study done among a population of 534 patients with chronic schizophrenia in a state mental institute in Singapore in the year 2000, Chong et al[3] found that the rate of polypharmacy was 59%. More recently, Sim et al[6,8] conducted a similar survey in the same institute and reported the rate of polypharmacy to be 45%.

Even within the same treatment centre, prescription patterns differ among psychiatrists, and each may have his own preferred combination of medications, which might have proven to be efficacious over the years for various reasons, including personal experience with a combination of drugs,[9] adherence to trusted and handed-down prescription patterns, lack of awareness of, or disagreement with, or reluctance to follow guidelines.[10] Some clinicians may even view guidelines as intrusions on their creativity and autonomy.[11,12]

Most of the published studies have been conducted among patients with chronic schizophrenia. To our knowledge, none has been conducted on patients with first-

[1] Department of Early Psychosis Intervention
[2] Research Unit
Institute of Mental Health, Singapore
[3] National University of Singapore, Singapore
Address for Reprints: Dr Chong SA, Director of Research, Chief, Department of Early Psychosis Intervention, Institute of Mental Health, 10 Buangkok View, Singapore 539747.
Email: Siow_Ann_CHONG@imh.com.sg

episode psychosis (FEP). Various treatment guidelines have emphasised the use of low-dose antipsychotic monotherapy for patients with FEP.[13-15]

This study aimed to assess the prevalence of polypharmacy among patients with FEP, and the impact following the implementation of a treatment algorithm on antipsychotic use in patients with FEP who were accepted into an early psychosis intervention programme (EPIP).[16,17] The treatment algorithm, which was based on evidence from the literature,[18-20] emphasises the use of a single antipsychotic agent and short-term use of benzodiazepines for disturbed behaviour early in the treatment rather than increasing the dose of antipsychotic. Compliance with the treatment algorithm for patients within the programme was checked by regular audits.

Materials and Methods

This study was conducted in the Institute of Mental Health, which is the only state mental institute in Singapore, and is the tertiary treatment centre for patients with severe mental illnesses. The study was approved by the Ethics Review Board.

Since the inception of the EPIP, all patients with FEP who sought help at the Institute of Mental Health and who fulfilled the intake criteria (age range, 18 to 40 years, no previous psychiatric consultation) have been accepted into the programme. As such, for this study we had to use a comparator group: the prescribing pattern of a group of patients with FEP, who received psychiatric treatment at the Institute of Mental Health in the calendar year of 2000 i.e., prior to the implementation of EPIP, was compared with the prescribing pattern of FEP patients (matched for age and gender) who were accepted into the EPIP from April 2001 to March 2004.

Table 1. Age, Gender Distribution and Diagnoses of Historical Controls and EPIP Patients

	Historical controls n (%)	**EPIP** n (%)
Gender		
Male	42 (61.8)	264 (54.7)
Female	26 (38.2)	219 (45.3)
Diagnoses		
Affective psychoses*	0 (0.0)	46 (11.1)
Brief psychotic disorder*	0 (0.0)	40 (9.7)
Delusional disorder*	0 (0.0)	14 (3.4)
Psychosis not otherwise specified*	18 (26.5)	24 (5.8)
Schizophrenia/Schizophreniform disorder	50 (73.5)	290 (70.0)

EPIP: Early Psychosis Intervention Programme
* P <0.05

The prescribing pattern of the comparator group and EPIP patients were abstracted at baseline (i.e., at the first contact after a definitive diagnosis of psychosis was made), and at 3 months.

The diagnosis of the patients was made in accordance with DSM-IV criteria by experienced psychiatrists, and the daily antipsychotic dosage was converted to chlorpromazine (CPZ) mg equivalents using standard guidelines.[21,22] The duration of untreated psychosis (DUP) was defined as the onset of hallucinations and/or delusions, disorganised thinking and/or behaviour to the time of appropriate treatment. This was ascertained from the medical records, interviews with the patients and the main caregivers.

The patients in the EPIP were also assessed at baseline and 3 months using the Positive and Negative Syndrome Scale (PANSS),[23] and the Simpson-Angus Rating Scale (SARS).[24] Unfortunately, no systematic ratings were done for the comparator group.

Results

Sixty-eight historical controls and 483 EPIP patients were included in the study. The mean (SD) age of the historical controls was more than the EPIP patients: 30.1 (6.8) years versus 28.2 (6.7) years (P <0.05). The median DUP of the EPIP patients was not significantly different from that of the comparator group (4 months vs 6 months, $Z = -0.802$, $P = 0.423$). Table 1 shows the gender distribution and diagnoses of these 2 groups.

There was a lower rate of antipsychotic polypharmacy among the EPIP patients at baseline and at the third month compared to the comparator group (Table 2). More patients were prescribed second-generation antipsychotics and correspondingly, there was a lower rate of use of anticholinergic agents in EPIP patients. The mean (SD) daily antipsychotic dose of the comparator group was more than the EPIP patients at baseline: 222.1 (166.1) mg CPZ eq versus 170.2 (151.6) mg CPZ eq, $t = -2.45$, $P = 0.01$. The same was observed at the third month: 252.2 (236.9) mg CPZ eq for the comparator group, and 179.1 (148.4) mg CPZ eq for the EPIP patients, $t = -2.86$, $P = 0.004$.

Using the definition of positive response as a ≥20% decrease in PANSS scores, 87.5% of EPIP patients were responders by the third month. Using a total SARS score of 2 or more to indicate a case of drug-induced parkinsonism, the incidence of extrapyramidal side effects (EPSE) was 5.6% among the EPIP patients.

Discussion

We have shown that even for patients with FEP, there was a tendency towards polypharmacy – at least 22.7% of the comparator group were receiving 2 or more antipsychotic medications at baseline and 25.0% at the third month.

Table 2. Medications Prescribed to Historical Controls and EPIP Patients

Psychotropic drug prescription	**Historical controls** n (%)	**EPIP** n (%)
Baseline	n = 68	n = 415
Number of antipsychotics prescribed		
0 antipsychotic*	0 (0.0)	12 (2.9)
1 antipsychotic*	51 (77.3)	383 (92.3)
2 antipsychotics*	15 (22.7)	19 (4.6)
>2 antipsychotics	0 (0.0)	1 (0.2)
Type of antipsychotic prescribed		
First-generation antipsychotic*	57 (86.4)	187 (45.1)
Second-generation antipsychotic*	9 (13.6)	216 (52.0)
Other psychotropic drugs prescribed		
Benzodiazepines	41 (62.1)	238 (57.3)
Antidepressants	7 (10.6)	47 (11.3)
Mood stabilisers	0 (0.0)	4 (1.0)
Anticholinergics*	37 (56.1)	102 (24.6)
At 3 months	n = 52	n = 360
Number of antipsychotics prescribed		
0 antipsychotic*	0 (0.0)	22 (6.1)
1 antipsychotic*	39 (75.0)	318 (88.3)
2 antipsychotics*	12 (23.1)	20 (5.6)
>2 antipsychotics	1 (1.9)	0 (0.0)
Type of antipsychotic prescribed		
First-generation antipsychotic*	38 (73.1)	115 (31.9)
Second-generation antipsychotic*	14 (26.9)	223 (61.9)
Other psychotropic drugs prescribed		
Benzodiazepines*	13 (25.0)	43 (11.9)
Antidepressants*	3 (5.8)	69 (19.2)
Mood stabilisers*	1 (1.9)	24 (6.7)
Anticholinergics*	33 (63.5)	83 (23.1)

EPIP: Early Psychosis Intervention Programme
*P <0.05

Although the concurrent prescription of 2 antipsychotics could be an augmentation strategy or part of a cross-taper,[25] it seemed more likely to be the former in the case of the comparator group as the rate of polypharmacy remained very much the same at baseline and 3 months.

There was a fairly extensive use of benzodiazepines at the onset of treatment for both the comparator group and EPIP patients. There was a downward trend in the use of these agents but for the EPIP patients, it was significantly less than the comparator group.

The decreased use of anticholinergic agents in the EPIP cohort is very likely a direct consequence of the higher usage of second-generation antipsychotic medications with their more superior side effect profile with regard to EPSE.[26,27] The high rate of anticholinergic agent at baseline for the historical controls is indicative of the common practice of the prophylactic use of this agent among the doctors in this institute.[3]

There were more patients among the EPIP group who received mood stabilisers and antidepressants due to a higher diagnosis of affective psychoses in this group.

Reasons for polypharmacy are varied. In the absence of any guidelines or lack of compliance with guidelines, clinicians differ in their opinions and methods of management of patients with mental illness. There are some psychiatrists who believe in adding more drugs to a partially effective regime they have worked with, or to better manage side effects, or even to reduce costs for the patients.[28]

This study is limited by what Prien et al[29] have described as a "scatter gun" approach of collecting short-term prescription data, with its preoccupation with what treatment is prescribed, and not what treatment is prescribed and under what circumstances. As such, we are unable to make any definitive judgment about the appropriateness of the prescribing patterns in this hospital. The follow-up period of 3 months is relatively short and it may be possible that a more protracted length of observation could reveal further changes in the prescription pattern. However, most patients with FEP would show adequate response by the third month.[15] We also included patients with the various psychotic disorders, including brief psychotic disorder – the treatment of which may last less than 3 months. The use of a comparator group, with its lack of systematic assessments with rating instruments, and the possibility of a cohort effect are further limitations. Nonetheless, we have shown that the introduction of an algorithm for antipsychotic drugs – with audits to check for compliance with the algorithm – has reduced polypharmacy in patients with FEP with good clinical response, and reduced the prolonged prescription of benzodiazepines. Although we did not examine the costs of treatment, some studies have shown that compliance with treatment guidelines that recommended antipsychotic monotherapy resulted in lower costs.[30]

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