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Prescription of psychotropic medications in primary care: a cross-sectional study of general practice computer records

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ABSTRACT

Background Mental health problems are common in England, and new medications potentially offer equal or greater efficacy with increased patient safety and fewer side-effects.

Objective To examine the use of psychotropic medications in primary care, in particular the use of more modern drug therapies.

Subjects and setting Using routinely collected computer data from 12 general practices with a combined list size of 117 000.

Method We collected anonymised data from general practice computer systems using MIQUEST (Morbidity Information Query and Export Syntax – a Department of Health-sponsored data extraction tool). Data were aggregated, cleaned and processed using an established methodology, then imported into a statistical package for analysis.

Results The use of psychotropic medication increased with age. Over one-third (35%) of women and one-quarter (23.8%) of men of the study population aged over 85 years were prescribed at least one psychotropic medication in the last year ($P < 0.001$). At all ages, women are twice as likely to

be prescribed psychotropic medication, though no more likely to be prescribed multiple therapies. One-quarter of those with a diagnosis of severe and enduring mental illness (SEMI) were not taking any psychotropic medication. Over half of those with SEMI on medication are taking more than one medication. The proportion of people prescribed atypical anti-psychotics has risen from 30% to 50%, with a corresponding fall in the use of older anti-psychotics. Twenty-one percent of females have been prescribed antidepressants, 14% in the last year. In contrast to anti-psychotics, the proportion of people prescribed more modern antidepressants has increased slightly.

Conclusions Females and older people are much more likely to receive psychotropic medications. Further research is needed to explore why the pattern of prescribing differs from what is known about the pattern of mental health problems.

Keywords: antidepressive agents, bipolar disorder, dementia, depression, depressive disorder, hypnotics and sedatives, mental disorders, phenothiazines, psychotropic drugs, schizophrenia

Introduction

Mental health disorders are a common cause of morbidity and sometimes mortality in primary care. Depression and anxiety are the commonest mental health problems seen in primary care.¹ The prevalence of major depression in primary care settings is between 5% and 10%;² its prevalence increases with age, and between 10% and 15% of older people have depressive symptoms.³ Up to 2% of the adult population are affected by generalised anxiety disorder and up to 80% of these may have features of depression.⁴ When depression and anxiety occur together there is a greater risk of suicide.⁵ Research, predominantly carried out in secondary care, reports a prevalence of severe mental illness (SMI) of between 4 and 9 per 1000 population.^{6–8} The most common of these conditions is schizophrenia, and the prevalence is approximately the same in both men and women.^{9,10} Sleep disorders are more common than any of these mental health problems, especially in the elderly where up to half of the population aged over 65 years may report problems.¹¹ These can be a feature of a mental health problem as well as a wide range of other conditions, and may lead to the prescribing of a wide range of medications, despite the lack of an evidence base beyond short-term use.¹²

Drug therapy for mental health disorders offers benefits for those with mental health problems; however the drugs used can also cause morbidity and mortality. In most therapeutic areas newer agents have been introduced with the aim of reducing side-effects, the risk of death from overdose and other fatal side-effects. The traditional tricyclic antidepressants were known to be effective; they also offer benefits at the lower doses generally used in primary care and appear to be effective.¹³ Unfortunately they are fatal in overdose and often cause other troublesome side-effects, the most serious being cardiotoxicity.¹⁴ Monoamine oxidase inhibitors (MAOIs) seem less effective in severe depression than tricyclics, but may be more effective where biological features of depression predominate.¹⁵ Selective serotonin uptake inhibitors (SSRIs) were subsequently introduced because they were thought to be safer in overdose, and a meta-analysis suggests they have fewer side-effects, though they may be no more cost-effective than tricyclics.^{16,17} SSRIs have also been found to have a lower rate of side-effects in a meta-analysis of their effects on elderly people. However, a significant minority found these side-effects intolerable and the rate of overall tolerability was similar to that found with tricyclics. This review concluded that tricyclics should be offered as an

alternative when SSRIs are either contraindicated or clinically unacceptable to elderly patients.¹⁸ There has also been concern about the safety of SSRIs in young people and increased suicide risk, and over abrupt withdrawal.^{19–23}

Antipsychotic preparations have also evolved with time, with new preparations designed to be longer acting and reduce side-effects. Traditional anti-psychotics have potentially serious adverse effects, which include sedation, confusion, falls, urinary symptoms, hypotension, cardiac side-effects, extrapyramidal side-effects (EPSE) and tardive dyskinesia (TD).²⁴ The use of depot injections in schizophrenia increases patient compliance.^{25,26} The National Institute for Clinical Excellence (NICE) guidance issued in 2002 suggests atypical anti-psychotics should be considered as a first-line treatment for newly diagnosed schizophrenia.²⁷ They produce fewer side-effects and there is some evidence of lower relapse rates with specific therapies.^{28–30} NICE recommend that atypicals should be considered in patients with existing schizophrenia where side-effects of existing medication are unacceptable or where their illness has been refractory to other treatment. Some of the atypicals, notably olanzapine and risperidone, are associated with a greater risk of cerebrovascular accident (CVA), so they should be used with greater caution in the very elderly.³¹ Clozapine has been associated with increased fatal myocarditis and agranulocytosis, so it is only licensed for resistant disease, though it is argued that this may result in it being underused.^{32,33} Overall, any increased mortality rates with atypicals is thought to be small.³⁴

As in the other therapeutic areas, new hypnotics have been developed and designed to reduce the risk of side-effects and, particularly, dependence. The older hypnotics and anxiolytics have problems in inducing dependence.³⁵ While sedative hypnotics, which also include antihistamines, are effective in increasing sleep, in the elderly this may be at the expense of increased risk of falls and cognitive impairment.³⁶ NICE issued guidance on the use of the non-benzodiazepine hypnotics, or 'Z-drugs' (zaleplon, zolpidem and zopiclone), which was partly stimulated by concerns about benzodiazepines and the need to find suitable alternatives.³⁷ Their recommendation is that hypnotics should be used after non-pharmacological means have been exhausted, and for short periods.

We conducted this study to explore the current rate of prescribing of psychotropic medications, and to investigate the extent to which modern psychotropic medications are being used in practice. In addition we wanted to investigate whether there were significant differences in prescribing between different sexes and age groups.

Methods

We carried out a literature review of major bibliographic databases to identify papers about drug therapy for severe mental illness and depression. We collected anonymised data from 12 general practitioner (GP) practices with a combined practice population of 117 000 patients. These practices were all computerised general practices with current computer systems in place for at least five years. All practices used the computer to record data during the clinical consultation, and with the exception of some home visits, did all their prescribing using the computer. They had also all taken part in the PCDQ (Primary Care Data Quality) cardiovascular quality improvement scheme, which is an educational intervention designed to encourage greater computer use to improve the management of heart disease.³⁸

Data were extracted using MIQUEST (Morbidity Information and Export Syntax) a Department of Health-sponsored data extraction tool.³⁹ Data were then transferred to a relational database and analysed using a statistical package. We followed an established five-step methodology to process these data, which was derived from an error reduction approach developed by Berndt *et al.*^{40,41} These stages are: (1) migration of the data into a data repository; (2) integration of the data with data from other practices; (3) data cleaning; (4) data processing; and (5) transfer of data into an appropriate statistical package for analysis.

This is a further analysis of the same sample reported in an earlier paper which describes the inequalities in cardiovascular risk, screening and prevention in people with mental health problems,

despite their receiving increased health education in primary care.⁴² This is therefore the same study population, from the same practices. However, instead of using a diagnosis or treatment with an antipsychotic as our main unit of analysis for this study, we have looked at all patients who have been prescribed one or more psychotropic drug. We extracted prescription data independently of diagnostic data, because routinely collected general practice computer data tends not to have reliable linkages between prescription and diagnostic data. When a disease code appears in the medical record, it may refer to when a disease was coded rather than its onset, especially since computerisation is a phenomenon of the last two decades in the UK.⁴³ Consequently, drug data were extracted and recoded into categories. The dataset analysed for this study is shown in Box 1.

We define psychotropic drugs as medications that have therapeutic effects that are capable of affecting the mind, emotions and behaviour. We use the term 'psychotropic' in this paper to include all medications listed in the first three sections of chapter 4, Central nervous system, of the *British National Formulary* (BNF No. 50).⁴⁴ The relevant sections are: Hypnotics and anxiolytics (4.1); Drugs used in psychoses and related disorders (4.2); and Anti-depressant drugs (4.3). For simplicity we refer in the rest of the paper to hypnotics and anxiolytics as 'anxiolytics' unless hypnotics are specified as a separate group; drugs used in psychoses and related disorders are labelled as 'anti-psychotics'; and anti-depressants remain unaltered.

We subdivided these sections into further subgroups for analysis. The anxiolytics are subdivided into benzodiazepines; the non-benzodiazepine

Box 1 Study dataset

Patient identifiers/demographics

- 1 MIQUEST unique ID
- 2 YoB (year of birth)
- 3 Sex
- 4 First part postcode (to link to socio-economic data)
- 5 Ethnicity (very poor levels of recording)

Read-coded variables

1 Diagnoses

- a Psychosis (diagnosis, date)
- b Mania (diagnosis, date)

2 Psychotropic medication

- a Anti-psychotics: depot and non-depot (latest two scripts, date and value)
- b Antidepressants (latest two scripts, date and value)
- c Anti-manic drugs (latest two scripts, date and value)
- d Hypnotics and anxiolytics (latest two scripts, date and value)

hypnotics, or 'Z-drugs'; chloral and its derivatives; antihistamines, barbiturates and buspirone. We did not collect data about beta-blockers as it is often impossible to differentiate from the computer record if a beta-blocker is being used as an anxiolytic or to treat cardiovascular disease or migraine.

The anti-psychotics were subdivided into 'typical or atypical' to describe the established drugs, again as is done in the *BNF*. These were further subdivided into depot and non-depot; depending on whether they are administered by injection at intervals or orally. We separately listed the atypical anti-psychotics, again using the *BNF* categorisation. Where we use the term 'non-depot anti-psychotic' – we are referring to a traditional anti-psychotic and are excluding members of the 'atypical' group. The prescription of the anti-mania drug lithium was also extracted as part of the anti-psychotics group. Although some atypicals have a role in mania, as do some anticonvulsants such as valproate and carbamazepine, our searches only returned lithium prescriptions. Therefore a search for anti-manic prescription data is synonymous with a search for lithium and will have missed anticonvulsants used in this role.

The antidepressants were grouped by type, again based on the taxonomy used in the *BNF*. We grouped together tricyclic and related antidepressants together as 'tricyclics'; monoamine-oxidase inhibitors (MAOIs); selective serotonin uptake inhibitors (SSRIs); and others.

Data were analysed using SPSS (Statistical Package for Social Sciences) version 12. Use of medication was analysed in isolation of diagnosis for reasons mentioned above. While we recognised that some of the drugs may be used for other indications (e.g. diazepam for back pain), we worked with the assumption that these numbers are small. For this reason we have quoted crude percentages throughout this study and have not standardised data. Simple descriptive statistics were used and Chi-squared tests were conducted to describe significant differences in populations.

Approval for the study was given by local research ethics committees in West Surrey.

Results

Prescription of psychotropic medication by age and sex

The study population consisted of 117 461 patients drawn from 12 practices in West Surrey. Details about demographics, ethnicity and the age–sex distribution

are contained in our earlier paper.⁴² Ethnicity data were poorly recorded in general practice (<5%), so are not reported.

There was a sex difference in the prescription of psychotropic medication, and the use of more than one type of medication was common. Females were twice as likely to be prescribed psychotropic medication as males; this difference is seen in all age bands. There was also an association between increasing age and the prescription of psychotropic medication ($P < 0.001$, Chi-square); the results are shown in Table 1. Those in older age groups were much more likely to receive multiple psychotropic medications. Among women aged 85 years and over, approximately one-third (35%) were prescribed one or more psychotropic medications in the last 12 months: with 24% being prescribed one psychotropic medication, 8.3% prescribed two, and 2.8% prescribed three or more. Among men aged 85 years and over, about one-quarter (23.8%) were prescribed at least one psychotropic medication: 15.4% prescribed one, 6.2% two and 2.2 three or more psychotropic medications.

Prescription of psychotropic medication by age and gender for people with severe mental illness

The same trend, though not as striking as in the general population (as shown in Table 1), was seen in people with severe and enduring mental illness (SMI). In the present study, SMI was indicated by the presence of a recorded diagnosis of psychosis (e.g. schizophrenia, psychosis, bipolar affective psychosis and psychotic depression), or prescriptions of anti-psychotic medication. Patients with a primary diagnosis of severe neurosis, dementia and personality disorders were excluded. The rationale for this operational definition of SMI is discussed in an earlier paper.⁴² More females (77.8%) were prescribed at least one psychotropic drug in the last 12 months than males (67.4%). There was also a direct association between age and prescription of psychotropic medications. The association was especially marked in patients in the over 75 years categories, with 81.8% of women and 75% of men aged between 75 and 84 years prescribed at least one psychotropic medication in the last 12 months. Overall this trend is equally statistically significant ($P < 0.001$, Chi-square test; Table 2). Multiple therapies were much more common in those with indications for SMI. More people with SMI are prescribed multiple drug therapies than those who are able to manage with a single agent: 29.3% are prescribed one psychotropic medication, 25.8% two and 18.3% three or more.

Table 1 Recorded prescription of psychotropic medication by age and sex (row %)

Age (years)	No record of psychotropic medication	One psychotropic medication	Two psychotropic medications	Three or more psychotropic medications	Total
Female					
24 and under	96.9	2.7	0.4	0.0	100 (<i>n</i> = 16 270)
25–34	87.9	9.9	1.8	0.5	100 (<i>n</i> = 8060)
35–44	85.1	11.7	2.5	0.7	100 (<i>n</i> = 9772)
45–54	82.3	13.5	3.1	1.0	100 (<i>n</i> = 7584)
55–64	80.2	15.0	3.7	1.1	100 (<i>n</i> = 6776)
65–74	78.9	15.1	4.7	1.4	100 (<i>n</i> = 4770)
75–84	72.1	20.1	5.7	2.1	100 (<i>n</i> = 3490)
85 and over	65.0	24.0	8.3	2.8	100 (<i>n</i> = 1647)
Total female	86.0	10.7	2.6	0.8	100 (<i>n</i> = 58 369)
Male					
24 and under	98.7	1.1	0.2	0.0	100 (<i>n</i> = 16 988)
25–34	93.9	5.0	0.9	0.2	100 (<i>n</i> = 8241)
35–44	92.6	5.4	1.5	0.5	100 (<i>n</i> = 10 521)
45–54	91.3	6.8	1.5	0.4	100 (<i>n</i> = 8386)
55–64	90.4	7.4	1.7	0.5	100 (<i>n</i> = 7082)
65–74	88.0	9.5	2.0	0.5	100 (<i>n</i> = 4685)
75–84	84.3	11.8	3.2	0.7	100 (<i>n</i> = 2561)
85 and over	76.1	15.4	6.2	2.2	100 (<i>n</i> = 628)
Total male	93.2	5.2	1.2	0.3	100 (<i>n</i> = 59 092)
All	89.6	7.9	1.9	0.6	100 (<i>n</i> = 117 461)

P < 0.001.

However, more than one-quarter (26.6%) of people with indications for SMI were not taking any psychotropic medication.

Prescription of antidepressants, anxiolytics or hypnotics by sex

Increased prescribing to females was seen in all other therapeutic groups (see Table 3). Overall 29.1% (17 008/58 369) of women had been prescribed an antidepressant, anxiolytic or hypnotic at some time. When the search was restricted to the last 12 months, the percentage fell to 14.0% (8017/58 369). The comparative figures for men were 16.7% and 6.5%, respectively.

Women in the study population received more antidepressants 21.4% (*n* = 12 475), anxiolytics 11.3% (*n* = 6607) and hypnotics 10.5% (*n* = 6129) than men. The comparative figures for men were antidepressants 10.4% (*n* = 6136), anxiolytics 6.6% (*n* = 3924) and hypnotics 6.2% (*n* = 3663) respectively. Rates of prescription for the last 12 months

showed similar sex differences, i.e. prescribing rates were approximately double for females. All these differences in prescribing rates between the sexes were statistically significant at the *P* < 0.001 level (Chi-square test). Overall, females were twice as likely to have been prescribed an anxiolytic in the last 12 months; prescriptions were issued to 3.3% of females and 1.7% (*n* = 1432) of men. Proportions were similar for ever having had a computer prescription for these drugs: 11.3% of females and 6.6% of men had had a prescription for anxiolytics at some time (Chi square test *P* < 0.001).

Further exploration (tables not shown) shows that the benzodiazepines remain the most prescribed class of anxiolytics and hypnotics, accounting for 65% of prescriptions; the 'Z-drugs' are the next most frequent, accounting for 30% of prescriptions; 1.5% are prescribed choral and its derivatives; and a similar proportion buspirone; approximately 1% of scripts are for antihistamines; 0.4% for chloremthiazole; 0.1% meprobamate; and a tiny number for barbiturates.

Table 2 Recorded prescriptions of psychotropic medication by age and sex for people with severe mental illness (row %)

Age (years)	No record of psychotropic medication	One psychotropic medication	Two psychotropic medications	Three or more psychotropic medications	Total
Female					
24 and under	27.7	34.0	29.8	8.5	100 (n = 47)
25–34	29.4	28.4	24.8	17.4	100 (n = 109)
35–44	24.9	32.2	18.6	24.3	100 (n = 177)
45–54	22.4	28.8	28.8	20.0	100 (n = 170)
55–64	22.9	25.3	26.5	25.3	100 (n = 166)
65–74	23.0	24.6	33.9	18.6	100 (n = 183)
75–84	18.2	31.5	28.1	22.2	100 (n = 203)
85 and over	16.6	35.5	28.4	19.5	100 (n = 169)
Total female	22.2	29.7	27.3	20.8	100 (n = 1224)
Male					
24 and under	54.2	26.4	13.9	5.6	100 (n = 72)
25–34	47.7	26.5	19.7	6.1	100 (n = 132)
35–44	29.8	23.4	26.1	20.7	100 (n = 188)
45–54	27.9	36.4	20.7	15.0	100 (n = 140)
55–64	29.7	29.0	24.6	16.7	100 (n = 138)
65–74	23.4	30.8	27.1	18.7	100 (n = 107)
75–84	24.7	32.9	30.6	11.8	100 (n = 85)
85 and over	25.0	22.7	29.5	22.7	100 (n = 44)
Total male	32.6	28.7	23.8	14.9	100 (n = 906)
All	26.6	29.3	25.8	18.3	100 (n = 2130)

$P < 0.001$.

Table 3 Prescription of antidepressants, anxiolytics or hypnotics by sex

	Prescribed an antidepressant, anxiolytic or hypnotic n (%)	Prescribed an Antidepressant n (%)	Prescribed an anxiolytic n (%)	Prescribed a hypnotic n (%)	Total sample size
All recorded prescriptions					
Female	17 008 (29.1)	12 475 (21.4)	6607 (11.3)	6129 (10.5)	58 369
Male	9891 (16.7)	6136 (10.4)	3924 (6.6)	3663 (6.2)	59 092
Total	26 899 (22.9)	18 611 (15.8)	10 531 (9.0)	9792 (8.3)	117 461
Recorded prescriptions in the last 12 months					
Female	8017 (13.7)	5718 (9.8)	1916 (3.3)	2352 (4.0)	58 369
Male	3870 (6.5)	2426 (4.1)	1004 (1.7)	1298 (2.2)	59 092
Total	11 887 (10.1)	8144 (6.9)	2920 (2.5)	3650 (3.1)	117 461

All $P < 0.001$.

Prescriptions of anti-psychotics by age and sex

Table 4 shows that in our study population, about 10 per 1000 females and 7 per 1000 males were prescribed at least one anti-psychotic medication in the last 12 months. There appears to be a consistent pattern in the way that anti-psychotic medications were prescribed, with slightly more females and older age groups treated with non-depot preparations of anti-psychotics: 500 females (228 + 272) given a prescription for oral anti-psychotics compared with 333 males (135 + 198). However, the proportion prescribed atypicals compared with typical anti-psychotics was marginally higher in men than women at 51.7% and 48.7%, respectively. There is a slight indication that the maximum use of depot preparations was between the ages of 35 and 65 years in men, but that these are used a decade later in women. Atypical antipsychotics appeared to be used more in the young (males and females under 45 years old) and among elderly females, with 64 women aged 75–84 years and 72 women aged 85 years and over prescribed an atypical anti-psychotic.

Antidepressant prescribing by type, age and gender

There were very different patterns in the use of antidepressants between the sexes and different age groups. Table 5 shows that in the last 12 months, antidepressants were prescribed more than twice as often to females compared with males at all age groups. This was true up to age 85 years, after which females are only one-and-a-half times more likely to receive an antidepressant. At age 75 years and over, 16.1% of women and 7.1% of men had received a prescription of antidepressant in the last 12 months. Exploratory analysis revealed (table not shown) that in the age group of 75–84 years, 30.6% of women and 15.4% of men were prescribed an antidepressant at some time and, in the age group 85–94 years, 32.0% women and 21% of men, respectively. Overall, 23% of our study population aged over 65 years were prescribed an antidepressant at some time.

Overall, selective serotonin reuptake inhibitors (SSRIs) were prescribed on more than half of all antidepressant prescriptions, with tricyclics prescribed around 30% of the time, and other antidepressants

Table 4 Prescriptions recorded in the last 12 months for antipsychotics by age and sex

Age (years)	Total sample size	Prescribed an anti-psychotic <i>n</i> (%)	Typical Anti-psychotic medications <i>n</i> (%)	Atypical Anti-psychotic medications <i>n</i> (%)	Depot injections only <i>n</i> (%)	Depot injection and oral anti-psychotic medications <i>n</i> (%)	Total number of prescriptions for anti-psychotics
Female							
0–24	16 270	19 (0.12)	5 (26.3)	14 (73.7)	0 (0.0)	0 (0.0)	19
25–34	8060	37 (0.46)	17 (45.9)	18 (48.6)	0 (0.0)	2 (5.5)	37
35–44	9772	60 (0.61)	18 (30.0)	36 (60.0)	1 (1.7)	5 (8.3)	60
45–54	7584	66 (0.87)	35 (53.0)	22 (33.3)	1 (1.5)	8 (12.1)	66
55–64	6776	70 (1.03)	30 (42.9)	23 (32.9)	1 (1.4)	16 (22.9)	70
65–74	4770	80 (1.68)	38 (47.5)	26 (32.5)	2 (2.5)	14 (17.5)	80
75–84	3490	115 (3.30)	48 (41.7)	61 (53.0)	0 (0.0)	6 (5.2)	115
85+	1647	111 (6.74)	37 (33.3)	72 (64.9)	0 (0.0)	2 (1.8)	111
Total	58 369	558 (0.96)	228 (40.9)	272 (48.7)	5 (0.9)	53 (9.5)	558
Male							
0–24	16 988	28 (0.16)	7 (25.0)	20 (71.4)	0 (0.0)	1 (3.6)	28
25–34	8241	49 (0.59)	13 (26.5)	34 (69.4)	0 (0.0)	2 (4.1)	49
35–44	10 521	75 (0.71)	23 (30.7)	38 (50.7)	1 (1.3)	13 (17.3)	75
45–54	8386	51 (0.61)	21 (41.2)	19 (37.3)	0 (0.0)	11 (21.6)	51
55–64	7082	47 (0.66)	19 (40.4)	14 (29.8)	0 (0.0)	14 (29.8)	47
65–74	4685	58 (1.24)	20 (34.5)	31 (53.4)	0 (0.0)	7 (12.1)	58
75–84	2561	45 (1.76)	24 (53.3)	20 (44.4)	0 (0.0)	1 (2.2)	45
85+	628	30 (4.78)	8 (26.7)	22 (73.3)	0 (0.0)	0 (0)	30
Total	59 092	383 (0.65)	135 (35.2)	198 (51.7)	1 (0.3)	49 (12.8)	383

Table 5 Antidepressant prescribing recorded in the last 12 months by type and sex

Age (years)	Total sample size	Prescriptions for antidepressant <i>n</i> (%)	Tricyclics <i>n</i> (%)	MAOIs <i>n</i> (%)	SSRIs <i>n</i> (%)	Other <i>n</i> (%)	Total number of prescriptions for antidepressants
Female							
0–24	16 270	405 (2.5)	80 (19.8)	0 (0.0)	281 (69.4)	44 (10.9)	405
25–34	8060	794 (9.9)	125 (15.7)	0 (0.0)	568 (71.5)	101 (12.7)	794
35–44	9772	1168 (12.0)	247 (21.1)	0 (0.0)	757 (64.8)	164 (14.0)	1168
45–54	7584	1018 (13.4)	313 (30.7)	2 (0.2)	580 (57.0)	123 (12.1)	1018
55–64	6776	889 (13.1)	380 (42.7)	1 (0.1)	417 (46.9)	91 (10.2)	889
65–74	4770	583 (12.2)	275 (47.2)	4 (0.7)	233 (40.0)	71 (12.2)	583
75–84	3490	562 (16.1)	264 (47.0)	2 (0.4)	209 (37.2)	87 (15.5)	562
85+	1647	299 (18.2)	92 (30.8)	2 (0.7)	158 (52.8)	47 (15.7)	299
Total	58 369	5718 (9.8)	1776 (31.1)	11 (0.2)	3203 (956.0)	728 (912.7)	5718
Male							
0–24	16988	154 (0.9)	27 (17.5)	1 (0.6)	106 (68.8)	20 (13.0)	154
25–34	8241	326 (4.0)	66 (20.2)	0 (0.0)	210 (64.4)	50 (15.3)	326
35–44	10 521	520 (4.9)	107 (920.6)	0 (0.0)	324 (62.3)	89 (17.1)	520
45–54	8386	470 (5.6)	138 (29.4)	0 (0.0)	256 (54.5)	76 (16.2)	470
55–64	7082	424 (6.0)	188 (44.3)	0 (0.0)	178 (42.0)	58 (13.7)	424
65–74	4685	278 (5.9)	123 (44.2)	1 (0.4)	110 (39.6)	44 (15.8)	278
75–84	2561	181 (7.1)	75 (41.4)	0 (0.0)	74 (40.9)	32 (17.7)	181
85+	628	73 (11.6)	24 (32.9)	0 (0.0)	42 (57.5)	7 (9.6)	73
Total	59 092	2426 (4.1)	748 (30.8)	2 (0.1)	1300 (53.6)	376 (15.5)	2426

used for the remaining patients. Monoamine oxidase inhibitors were prescribed to less than 0.2% of patients. About 70% of younger females aged 34 years or under on antidepressants were prescribed a SSRI, and this decreased progressively with increasing age to around 40% of those aged 65 years and over. The converse pattern was seen in tricyclic antidepressant prescribing, less than 20% of young women aged 34 years or under were prescribed tricyclics, peaking at 47% in the 65–84 years age groups. A similar pattern of antidepressant prescriptions was observed among males.

Antidepressant and anti-psychotic prescribing: changes over time

A comparison of recorded prescriptions in the last 12 months with all recorded prescriptions shows that some changes in the use of antidepressant and anti-psychotic drugs can be observed over time (see Table 6). Among individuals who received a prescription of antidepressant, there was a very modest increase in the proportion of SSRI prescriptions in the last 12 months compared with that of all records of antidepressant prescriptions, from 52.4% to 55.3%,

and a slight decrease in the use of tricyclics, from 38.7% to 31%. The increase in prescribing of SSRIs was slightly greater in females than males, and the decrease in the use of tricyclics in females is, however, slightly lower than for males.

Among patients who had received a prescription of anti-psychotics, a striking finding was that there was a clear shift from the use of typical to the atypical anti-psychotics over time. The proportion of prescriptions of atypicals increased from 30.4% of all recorded prescriptions of all antipsychotic prescriptions, to 49.9% in the last 12 months, and typicals decreased from 59.6% to 38.6%. The proportion of individuals receiving depot injections remained fairly constant at about 10–11%.

Discussion

The principal finding of this study is the higher use of psychotropic medications in women and in older age groups of the study population. We also found that in almost all age groups, females are more likely to receive antipsychotic medications, when apparently

Table 6 Antidepressant and antipsychotic prescribing: changes over time

	Recorded prescriptions of antidepressant				Total number of prescriptions for antidepressants
	Tricyclics <i>n</i> (%)	MAOIs <i>n</i> (%)	SSRIs <i>n</i> (%)	Other <i>n</i> (%)	
All records					
Female	4698 (37.7)	19 (0.15)	6701 (53.7)	1056 (8.5)	12 474
Male	2496 (40.7)	8 (0.13)	3055 (49.8)	577 (9.4)	6136
Total	7194 (38.7)	27 (0.15)	9756 (52.4)	1633 (8.8)	18 610
In the last 12 months					
Female	1776 (31.1)	11 (0.2)	3203 (56.0)	728 (12.7)	5718
Male	748 (30.8)	2 (0.1)	1300 (53.6)	376 (15.5)	2426
Total	2524 (31.0)	13 (0.2)	4503 (55.3)	1104 (13.6)	8144
	Recorded prescriptions of anti-psychotics				Total number of prescriptions for anti-psychotics
	Typical Anti-psychotic medications	Atypical Anti-psychotic medications	Depot injections only	Depot injection and oral anti- psychotic medications	
All records					
Female	694 (61.2)	341 (30.1)	20 (1.8)	79 (7.0)	1134
Male	482 (57.5)	258 (30.8)	14 (1.7)	84 (10.0)	838
Total	1176 (59.6)	599 (30.4)	34 (1.7)	163 (8.3)	1972
In the last 12 months					
Female	228 (40.9)	272 (48.7)	5 (0.9)	53 (9.5)	558
Male	135 (35.2)	198 (51.7)	1 (0.3)	49 (12.8)	383
Total	363 (38.6)	470 (49.9)	6 (0.6)	102 (10.8)	941

the incidence of severe and enduring mental illness is similar between the sexes. Reported prevalence of depression is almost twice as high in females, so the difference in rates of prescribing of antidepressants is less surprising. We also found a high level of use of drug therapy, including multiple drug therapy, in the elderly. When the use of antidepressants and anti-psychotic medications in the last 12 months is examined against all recorded prescriptions, a very modest shift from the older drug therapy for depression is observed. The use of new-generation anti-psychotic medications on the other hand, seemed more widely adopted in primary care.

Implications for practice

Practitioners are urged to reflect as to whether they are over-prescribing for female patients or under-

prescribing for their male patients. The sex difference in prescribing is seen in all age bands and across all medication groups. We also need to explore why more modern medications, with the exception of atypical anti-psychotics, are used proportionately more in females.

Limitations of the study

The principal limitation of this study is that these data are taken from computer records. These records are by and large not problem orientated, so it is not possible to know the indications for which the medications were prescribed, some of which are non-psychiatric, e.g. benzodiazepines are widely used in the treatment of muscular spasm associated with back pain. These data are also taken from a small number of practices predominantly in the southeast,

and may not represent the national picture. Some disadvantaged groups such as homeless people or those with no fixed abode are likely to be under-represented in the study, as they may not be registered with a GP.

Comparison with the literature

The fact that more women than men in the sample were prescribed anti-psychotics is perhaps surprising. The main indications for anti-psychotics are schizophrenia, brain damage, mania, toxic delirium and agitated depression. The most prevalent of these conditions are schizophrenia and mania, and the prevalence of both is approximately the same in men and women.^{45,46} As a percentage of all patients prescribed anti-psychotics within a particular age range, men were generally more likely to be prescribed atypicals, while women were more likely to be prescribed typical anti-psychotics. The use of depot injections in schizophrenia increases patient compliance,^{47,48} and it is interesting to note that men seemed marginally more likely to be prescribed anti-psychotics in this form. Increased prescribing of atypicals in younger patients may be expected, given the NICE guidance issued in 2002 which suggested that atypicals should be considered as a first-line treatment of newly diagnosed schizophrenia. Atypicals in patients with existing schizophrenia would only be considered where side-effects of existing medication are unacceptable, or where their schizophrenia has been refractory to other treatment; this may explain the lower use of atypicals in the 'middle' age categories. The increased use of atypicals in the elderly, especially the very elderly, may not be what one would expect, as some of these medications, notably olanzapine and risperidone, are associated with a greater risk of CVA.

Overall, antidepressants were prescribed to 15.8% of the sample. Although depressive disorders are common, this may be higher than one might expect; the prevalence of major depression in primary care settings is between 5% and 10%.²⁶ The prevalence of depression in older adults in the sample was also higher than the literature might suggest: 23% of the over 65s in the study population were taking antidepressants, whereas other studies have suggested that between 10% and 15% of older people have depressive symptoms.⁴⁹ In absolute numbers, women within the sample were approximately twice as likely as men to be prescribed an antidepressant: one in five females and one in ten males of the study population had a recorded prescription of antidepressant in the GP computer information systems. This is consistent with literature which suggests that women are diagnosed with depression twice as often as men.

Although there have been some concerns raised about the safety of SSRIs, particularly with regard to suicide risk and withdrawal effects, the Committee for Safety of Medicines (CSM) stated in December 2004 that SSRIs are effective medicines in the treatment of depression and anxiety conditions and that the balance of risks and benefits of all SSRIs in adults is positive. Their current level of use seems to indicate that this advice has been partially heeded with only a small decline in the proportion used. The low use of MAOIs is in line with current prescribing patterns and is unsurprising given their interactions, particularly the potentiation of the pressor effect of tyramine.⁵⁰

Call for further research

Further research is needed to explore the reasons for these apparent inequalities in prescribing and the impact of NICE guidance on the use of anti-psychotics in primary care, particularly to explore the precise indications for therapy within each group. The apparent sex differences in the reported prevalence of depression warrant further investigations.

Conclusions

There is considerable variation in prescribing to different sex and age groups. More psychotropic medication is prescribed to females, and in many areas at levels this is higher than the known prevalence for disease. Further research is needed to explain the reasons for high levels of prescribing psychotropic medications.

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SdeL, TC, AC conceived the study. SdeL and TC wrote the protocol with input from AC and submitted it to ethics. NH developed the dataset and wrote the MIQUEST queries. NH and ND tested the queries. JvV developed the system to aggregate the data and perform some of the analysis. LT coordinated the study and recruited the practices. ND collected these data. TC, SdeL, JvV, LT and ND all contributed to the analysis. SdeL wrote the first draft of the paper, with input from all authors. APR conducted the literature review.

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CONFLICTS OF INTEREST

None.

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