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Psychiatrists' use, knowledge and attitudes to first- and second-generation antipsychotic long-acting injections: comparisons over 5 years

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Abstract

Psychiatrists' attitudes and knowledge about antipsychotic long-acting injections (LAIs) are important given the increasing emphasis on patient choice in treatment and the availability of second-generation antipsychotic (SGA) LAIs. A cross-sectional study of consultant psychiatrists' attitudes and knowledge in North West England was carried out. A pre-existing questionnaire on clinicians' attitudes and knowledge regarding LAIs was updated. Of 102 participants, 50% reported a decrease in their use of LAIs. LAI prescribing was evenly split between first-generation antipsychotic (FGA) and SGA-LAIs. Most regarded LAIs as associated with better adherence (89%) than tablets. A substantial proportion believed that LAIs could not be used in first-episode psychosis (38%) and that patients always preferred tablets (33%). Compared with a previous sample, the current participants scored more favourably on a patient-centred attitude subscale (60.4% vs 63.5%, $P = 0.034$) and significantly fewer regarded LAIs as being stigmatising and old-fashioned. Reported LAI prescribing rates have decreased in the last 5 years despite an SGA-LAI becoming available and most clinicians regarding LAIs as effective. Most attitudes and knowledge have remained stable although concerns about stigma with LAI use have decreased. Concerns about patient acceptance continue as do negative views about some aspects of LAI use; these may compromise medication choices offered to patients.

Key words

adherence; antipsychotics; attitudes; delayed action preparations; injections; schizophrenia

Introduction

Antipsychotic long-acting injections (LAIs) are predominantly used in the maintenance phase of schizophrenia. Current guidelines in the United States (Kane, *et al.*, 2003) and the United Kingdom (NICE, 2002) suggest that LAIs be considered when there have been problems with adherence to oral antipsychotics. In theory this could apply to about half of patients with schizophrenia; Glazer (2007) reported a non-adherence rate with oral antipsychotics in schizophrenia of approximately 50%, whereas Valenstein, *et al.* (2006) reported

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that 61% of patients with schizophrenia had difficulties with adherence at some point over the 4-year period. In comparison, adherence rates with LAIs appear more favourable. Two reviews on LAIs suggest a non-adherence rate of 24% (range 0–54%) (Young, *et al*., 1986, 1999). In a later study, 26% were reported to have poor adherence, based on the duration of missed injections (Tattan and Creed, 2001). Most recently, Shi, *et al.* (2007) calculated the mean medication possession ratio (cumulative number of days covered by LAI divided by 365 days) to be 91% for patients on first-generation antipsychotic (FGA) LAIs. In practise, only a minority (usually less than 25%) of patients with schizophrenia are prescribed LAIs leading some experts to argue that LAIs are under prescribed (Kane, *et al*., 1998; Patel and David, 2005; Glazer, 2007).

The reasons for the low prescribing rate of LAIs are unclear. Glazer (2007), writing about prescribing decisions regarding LAIs, stated that 'clinicians' decision-making can be, to put it mildly, bizarre'. This may reflect the difficulty in identifying patients with medication adherence problems (Heres, *et al*., 2006). Although psychiatrists regard adherence as a key factor when considering LAI prescribing (Lambert, *et al*., 2003; Patel, *et al*., 2003a), research shows that they are not good at identifying which patients have adherence problems (Gilmer, *et al*., 2004; Byerly, *et al*., 2005). LAIs overcome covert non-adherence as it is immediately obvious to the clinician when the patient has not been given their injection. However, it should be noted that LAIs do not overcome overt non-adherence, that is, not all patients are willing to accept an LAI and so they are not a panacea to adherence problems.

Alternatively, low LAI prescribing may reflect some clinicians' perception that LAIs have an 'image' problem (Patel, *et al*., 2003a) and an assumption that patients do not want LAIs. In contrast, several studies report that most patients currently prescribed a LAI are accepting it and many prefer this formulation to oral tablets (Walburn, *et al*., 2001; Wistedt, 1995; Heres, *et al*., 2007). A better understanding of the attitudes and knowledge of the prescriber may help explain LAI prescribing (Patel and David, 2005), but recently, both Nasrallah (2007) and Glazer (2007) separately concluded that there were insufficient data currently available to achieve this. It is unclear to what extent the recent introduction of a second-generation antipsychotic (SGA) LAI may have altered prescribers' views and knowledge about LAIs.

Aims and hypotheses

This study aimed to investigate the current prescribing habits, attitudes and knowledge held by British consultant psychiatrists, concerning FGA-LAIs and SGA-LAIs. In addition by making comparisons with a previous study conducted in South East (SE) England in 2001, we aimed to determine whether views were still similar, now that an SGA-LAI has been available for some years. The null hypotheses were as follows: (1) current attitudes would not be associated with self-reported changes in rate of LAI use or personal dislike of injections and (2) attitudes and knowledge of the current sample would not differ from those reported previously.

Method

Design

A cross-sectional study of consultant psychiatrists' attitudes and knowledge working in North West (NW) England was carried out.

Participants and setting

Participants were identified from staffing lists of consultant psychiatrists in three large mental health trusts serving the cities of Manchester, Salford and Blackburn plus several surrounding towns and suburbs in NW England. Consultants whose job title indicated that they would have no direct involvement with LAI prescribing were excluded. Examples included consultants in child psychiatry and liaison psychiatry. The three trusts provided both inpatient and community psychiatric care to a total population of approximately 2 million, a large proportion of whom live in socially deprived urban areas. All three trusts have academic psychiatry units linked to the University of Manchester.

Questionnaire

A pre-existing questionnaire on clinicians' attitudes and knowledge regarding LAIs was updated. The development of the original questionnaire is described elsewhere (Patel, *et al*., 2003a). The original questionnaire had 44 statements in four subscales as follows: (1) patient-centred attitudes examining psychiatrists' beliefs about the actual patients, for example, 'A patient has no autonomy if they are prescribed a depot'; (2) non-patient-centred attitudes probing generalisations about LAI medication, for example, 'Depots are old fashioned'; (3) general knowledge about LAI medication in terms of indications, efficacy and pharmacology, for example, 'Depots are better for relieving negative symptoms than positive symptoms'; and (4) specific knowledge about side effects of LAI medication, for example, 'For typical depots, test doses are indicated to avoid severe prolonged adverse effects'. Internal reliability Cronbach's α values range from 0.36 to 0.51; weak correlations between the subscales were detected using Pearson's correlation indicating that the scales do not have significant overlap (Patel, *et al*., 2003a). Test-retest analysis was performed using the intraclass correlation method (one-way) for the four subscales; these ranged from $r = 0.65–0.73$ ($P < 0.05$). This is a satisfactory degree of reliability and range not unusual for this type of study (Dunn, 1989).

Minor amendments were made to the original questionnaire for some items to allow for differentiation between FGA-LAIs and SGA-LAIs (to take account of an SGA-LAI becoming available since the questionnaire was first developed). The term 'depot' was used and it was stated that this was a generic term used to refer to both FGA-LAI and SGA-LAI unless otherwise clearly indicated. The terms 'typical' and 'atypical' were used to refer to FGA and SGA, respectively. Twelve new statement items were added, eight of which concerned patient choice about medication. Items were scored on a six-point Likert scale (strongly disagree 0, disagree 1, vaguely disagree 2, vaguely agree 3, agree 4, strongly agree 5). Statements were positively and negatively worded to avoid response set bias. During analysis, scores were reversed as appropriate. Questions pertaining to basic demographic data and clinical experience and individual items on LAI prescribing preferences were also included. To preserve anonymity and confidentiality, no identifying details were requested.

Procedure

Data collection was conducted between June 2006 and June 2007. The participants received an information sheet, the postal questionnaire and a stamped reply envelope. All non-responders were sent a reminder letter and repeat questionnaire copy followed by telephone contact. Consent was deemed implicit if they returned a completed questionnaire to the investigators. Local ethical and research governance procedures were adhered to in this study.

Statistical analysis

Anonymised data were analysed using SPSS, Chicago, Illinois, USA (Version 15). Sample characteristic comparisons were made using x^2 for categorical variables and t-tests for continuous variables. Simple proportions were calculated for individual items. Summary scores for the four main subscales were calculated, reversing scores for negatively worded items (as detailed in Table 1) and converted into percentage values to allow for some missing data on individual items. High scores indicate more positive attitudes and greater knowledge. Mean subscale scores were compared using t-tests according to categorical variables of self-reported change in LAI use as well as gender, years of psychiatric experience (cut point 15 years), clinical specialty (general adult and elderly care vs others) and personal (dis)like of injections (moderate or strong dislike vs mild or no dislike). Subscale scores were also compared according to current LAI use (low use: 1–20 patients, $n = 34$; high use: 21+ patients, $n = 40$ [Patel, *et al*., 2003a]) using Mann–Whitney U test. A total percentage score was calculated using scores of all the attitudinal items and this was correlated and plotted against the total knowledge percentage score. The findings for the current sample were statistically compared using t-tests by subscale and individual item scores with those of a former sample ($N = 143$) comprising senior trainee and consultant psychiatrists in SE England in 2001 (Patel, *et al*., 2003a). In view of multiple testing for individual items, only those with $P < 0.002$ should be considered robust as only these would survive Bonferroni correction.

Results

Sample characteristics

The sample comprised 102 psychiatrists (response rate 102 of 143, 71%), working in various specialties including general adult (61%), old age (19%) and forensic psychiatry (10%). The remaining participants worked in other specialties including learning disability (1%), rehabilitation (4%), substance misuse (2%), deafness (2%) and adolescent psychiatry (1%). The sample had a mean average of 18.8 years (SD = 7.7, range 7–40 years) of psychiatric experience. Sixty-five percent were male. The median number of patients on a LAI per participant was 25. The most common age group of the participants (46%) was 40–49 years. Forty-three percent of the consultant psychiatrists in our sample had a moderate/strong dislike of injections for themselves, of these 23% actively avoided injections.

There were no statistically significant differences between the current and the previous samples for age group ($x^2 = 5.10$, $P = 0.164$), gender (SE England sample 2001: male 96 of 143 (67%), $x^2 = 0.16$, $P = 0.692$), years of experience (SE England sample 2001: mean 17.1 years [SD 8.2, range 4–44 years], $t = 1.56$, $P = 0.121$) and clinical specialty (SE England sample 2001: general adult 75 of 143 (52%), $x^2 = 1.68$, $P = 0.195$). In the previous sample, 111 of 143 (78%) were consultants. On the basis of respondents who provided information on their current use of LAIs, a significantly greater proportion of the previous 2001 sample were low users of LAIs (low LAI use = 1–20 patients): 2001 sample 68 of 96 (71%) vs 2007 sample 34 of 74 (46%); $x^2 = 10.8$, $P < 0.001$. However, approximately 30% of each sample did not provide numerical estimates.

Current prescribing practise

Consultant psychiatrist participants reported that their use of LAIs over the past 5 years had shown a major decrease (13%), moderate decrease (37%), no change (27%), moderate increase (22%) and major increase (1%). Only 4% rated LAIs (FGA or SGA) as their first-choice preference for long-term/maintenance treatment in schizophrenia; SGA-orals were overwhelmingly preferred (93%). The most common reason for them prescribing an LAI was a history of poor compliance with oral medication leading to relapse (82%), followed by patient request for an LAI (14%).

Our participants reported risperidone LAI (RLAI, 44%) as their most frequently initiated LAI over the last year, followed by flupentixol decanoate (depixol, 27%), zuclopenthixol decanoate (clopixol 9%), pipotiazine palmitate (piportil, 4%), fluphenazine decanoate (modecate, 1%), haloperidol decanoate

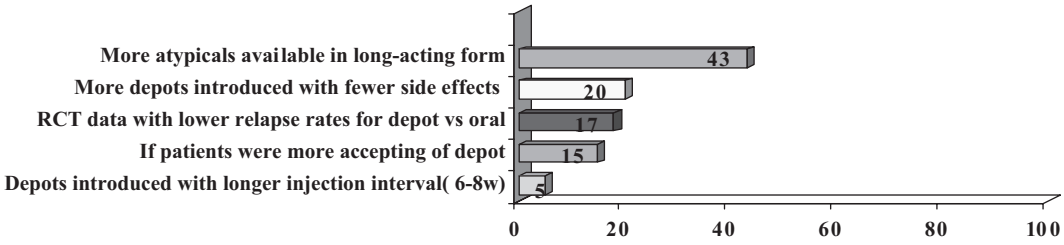

Figure 1 Persuading factors for more LAI use (forced choice).

(haldol, 1%) and no response (14%). However, 66% stated that they would prefer an SGA-LAI to an FGA-LAI when newly initiating an LAI. We speculate that more would prefer to use an SGA-LAI than actually report doing so, due to prescribing limitations enforced by the mental health trusts in an attempt to restrict costs. In a forced-choice selection of factors that would persuade them to use LAIs more, the factor cited as most important was 'having more atypicals available in long-acting depot form' (43%; Figure 1).

Patient choice

In newly designed individual items statements regarding patient choice, we noted that 33% of consultant psychiatrists believed that patients always prefer to have oral medication instead of an LAI (Table 1).

Attitudes and knowledge

Refer to Table 1 for individual items analysis. Most regarded LAIs as being associated with better compliance (89%) and prevention of relapse than oral antipsychotics (75%). Only 62% agreed that LAIs can be used for those with first-episode psychosis. Over half believed that the side effects are worse for LAIs than SGA-orals (57%). Psychiatrists' attitudes were moderately strongly positively correlated with knowledge (r = 0.45, $P < 0.001$; Figure 2) confirming previous findings (r = 0.39, $P < 0.001$) (Patel, *et al*., 2003a).

Psychiatrists who had a current high level of LAI use (regularly prescribing LAIs for >20 patients) had more favourable non-patient-centred attitudes than those with low LAI use (Mann–Whitney U test value = 434.5, $P = 0.018$). There were no other differences in subscale scores between those LAI high and low use groups.

Psychiatrists who reported that they had decreased their overall use of LAIs in the previous 5 years had significantly lower scores for the side effects knowledge subscale than those who had unchanged or increased rates of LAI use (mean 51.5 vs 54.8, t = 2.21, $P = 0.029$). There were no other differences in the subscale scores between those who had reduced their LAI prescribing and those who had not. Attitude and knowledge subscale scores did not significantly differ according to gender, years of psychiatric experience, clinical specialty or personal dislike of injections.

Linear regression analyses confirmed the association between attitudes (dependent variable) and knowledge but allowing for variables of current LAI use (high use vs low use), change in LAI use and clinical specialty did not significantly alter the significance of association between attitudes and knowledge. Knowledge predicts 20% of the variance for total attitudes regarding LAIs.

Comparison with previous sample (2001)

When compared with psychiatrists sampled 5 years previously, our current participants had more favourable patient-focused attitudes (mean 63.5% vs 60.4%, t = 2.13, $P = 0.034$; Figure 3). There were no significant differences in the other three subscales.

Item-by-item analysis revealed specific changes over time in approximately one-third of the 44 main items although the differences are relatively small (Table 1). Of particular note, significantly fewer participants regard LAIs as being stigmatising (mean 1.88 vs 2.42, $P = 0.002$) and old fashioned (1.49 vs 2.04, $P = 0.002$). However, concerns regarding patient fear of injections being a common reason for LAI rejection increased (3.44 vs 3.01, $P = 0.005$) and there was no difference in perceived

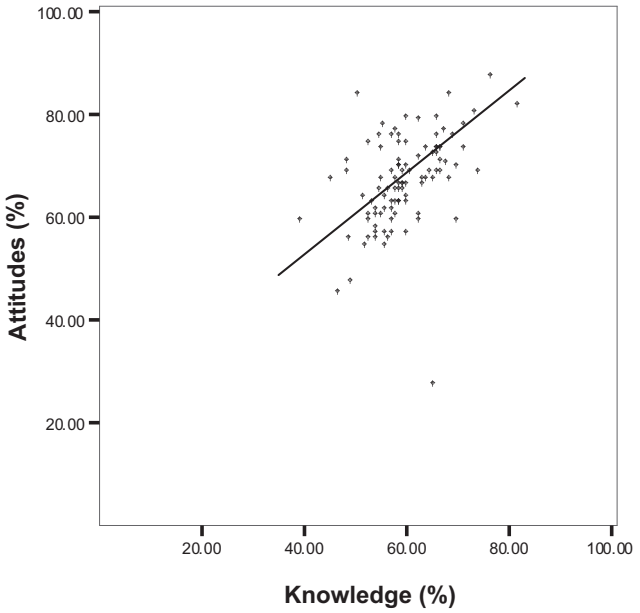

Figure 2 Total attitudes (%) against total knowledge (%).

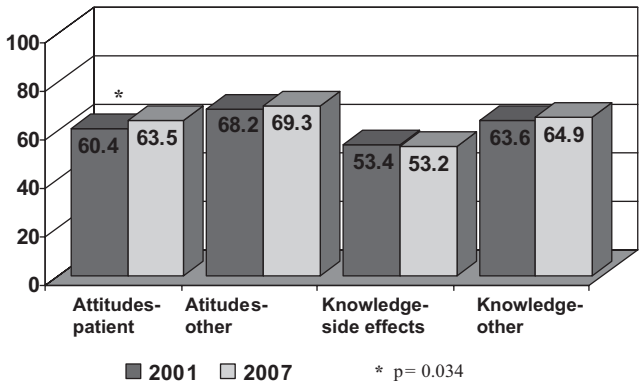

Figure 3 Subscales scores (%) – SE England 2001 vs NW England 2007.

patient acceptance of LAIs (3.24 vs 3.03, $P = 0.170$) or in prescribing LAIs as being coercive (1.29 vs 1.58, $P = 0.064$; Table 1).

Discussion

Strengths and limitations

The study targeted consultant psychiatrists, and not trainees, as the decision to use an LAI in the United Kingdom will usually be made by a consultant, albeit with the views of other team members being taken into account. We studied three different mental health trusts, achieved a reasonable response rate (71%) and obtained data from consultants working in a range of specialties. Although only psychiatrists in NW England were studied, the scores for the four scales of the questionnaire are broadly similar to a previous study conducted in SE England in 2001 (Patel, *et al*., 2003a) suggesting that the results are representative of the United Kingdom opinion. As in the original study, the cut-off between the knowledge and attitudes subscales was, to a certain extent, arbitrary, and there was no independent validation against actual behaviour and formally tested knowledge. Some of the knowledge statements have a rather limited evidence base and this may be reflected in the answers given by the participants. The impact of the psychiatrists' knowledge and attitudes on actual LAI prescribing practise needs quantification as reported and actual prescribing practises may not be identical. Some effects of presumed social desirability may have influenced responding.

The comparisons between the two samples should be interpreted with caution as it was not one sample tested twice but two different samples from two different geographical locations within the United Kingdom. Although the two samples of psychiatrists were not statistically different in terms of age, gender, clinical specialty or years of psychiatric experience, the potential for confounding remains as there may be group differences in local policies and sociodemographic variation in the two patient populations. A further possible confound is that significantly more of the previous sample were low users of LAIs. As 78% of the previous sample were consultants, the fact that senior trainees were excluded from the current sample is unlikely to have significantly influenced the findings.

Clinicians' prescribing practise

LAI use rates in decline Over the preceding 5 years, approximately the same period that an SGA-LAI has been available, our participants indicated that their overall LAI prescribing rates had decreased. This is contrary to that anticipated.

Choosing between LAIs FGA-LAIs and SGA-LAIs were favoured as the LAI of choice by approximately equal proportions of participants, whereas in terms of oral medication, the vast majority of our participants favoured SGA over FGA medication. This presumably reflects the fact that at present only one SGA-LAI drug is available, whereas there are multiple SGA-oral drugs. How prescribers choose between future LAIs remains unknown. Factors used by prescribers to differentiate between oral drugs may not necessarily translate to the equivalent LAI formulations. Even if equivalent efficacy is assumed, LAIs may differ in other ways, for example, need for initial oral supplementation and injection interval.

Use of LAIs in first-episode psychosis Just over half of the consultant psychiatrists in our sample agreed that LAIs can be used for those with first-episode psychosis. Resistance to using LAI in first-episode psychosis was also noted by Heres, *et al.* (2006) who reported that the majority (64–71%) of psychiatrists in their sample applied the rule of 'no depot in first-episode psychosis'. However, in reality, there is no evidence-based reason why an LAI cannot be used in first-episode psychosis. Indeed Emsley, *et al.* (2008) have reported remarkably low relapse rates in a sample of patients with first-episode psychosis treated with LAIs for 2 years. These researchers argue that LAI use early on may enhance medication adherence, thereby increasing treatment effectiveness in this crucial stage of the illness. However, as the acceptability of prescribing LAIs to patients in the first episode is under debate (Kane, *et al*., 2003; Here, *et al*., 2007), this warrants separate study with involvement of key stakeholder groups.

Antipsychotic polypharmacy Currently, there is a movement in the United Kingdom to reduce antipsychotic polypharmacy (POMH, 2008). However, only just over half of the participants agreed that LAIs seldom require additional long-term oral antipsychotics which suggest that polypharmacy is often used when prescribing LAIs. Although it is difficult to generalise for every individual patient, it would seem logical that if a patient required long-term oral supplementation of the LAI, this implies that the LAI at the given dose is ineffective and should be increased or the LAI switched. However, short-term additional oral antipsychotic use may not necessarily be wrong; rapid changes in serum antipsychotic levels are not possible to achieve by adjusting the dose of LAIs and therefore it

Table 1 Psychiatrists: subscales and items for LAI attitudes and knowledge

	North West England 2006/2007			South East England 2000/2001			t test	*P* value
	Agree (%)	Mean score	SD	Agree (%)	Mean score	SD		
Subscale: Attitudes 1 (patient centred)								
Depots are part of a patient-centred approach to treatment	77.6	3.33	1.32	71.1	3.15	1.30	1.00	0.319
The patient has no autonomy if they receive a depot (R)	11.1	0.99	1.15	11.3	1.28	0.99	−2.11	0.036
Prescribing depots is coercive (R)	17.2	1.29	1.26	22.4	1.58	1.13	−1.86	0.064
Patients can negotiate the dose of depot medication	86.7	3.51	1.10	81.1	3.42	1.21	0.60	0.554
Patients have a greater risk of being stigmatised if they receive a depot (R)	36.4	1.88	1.32	47.9	2.42	1.35	−3.11	0.002
If a patient is prescribed a depot, they are more likely to have a forensic history (R)	38.8	1.78	1.26	43.4	2.09	1.46	−1.71	0.089
Patients are less likely to accept depot than oral medication (R)	51.5	3.24	1.10	69.2	3.03	1.19	1.38	0.170
Patients' friends and family are more accepting of depot than oral medication (R)	41.4	2.26	1.10	33.6	2.09	1.01	1.28	0.201
Subscale: Attitudes 2 (non-patient centred)								
Patient compliance is better with depots than with oral antipsychotics	88.8	3.54	1.41	80.9	3.27	1.11	1.84	0.067
Monitoring patient compliance is easier with depots than with oral antipsychotics	95.9	4.14	0.92	95.1	4.07	0.88	0.62	0.539
Depots are associated with prevention of relapse	98.0	3.89	0.69	93.7	3.65	0.88	2.27	0.024
Depots are old-fashioned (R)	27.3	1.49	1.32	40.1	2.04	1.37	−3.10	0.002
Prescribing and monitoring are more bothersome for depot than oral medication (R)	7.1	0.96	0.88	9.1	1.11	0.97	−1.25	0.214
When newly initiating a depot I prefer an atypical depot rather than a typical depot/If there was an atypical antipsychotic depot, I would prescribe it	66.7	3.22	1.57	97.1	4.32	0.93	−6.24	<0.001
For depots, the good aspects outweigh the bad	71.9	3.10	1.14	68.6	2.86	1.00	1.71	0.088
Once a patient is on depot, it is unwise to discontinue (R)	24.5	1.80	1.22	14.0	1.44	1.09	2.38	0.018
Special depot clinics are the best place for administration of depot injections	51.0	2.53	1.36	43.7	2.19	1.46	1.83	0.069
Subscale: Knowledge 1								
Depots are appropriate for patients aged under 30 years[a]	68.1	3.23	1.29	63.4	2.77	1.31	2.65	0.009
Depots should not be commenced for voluntary/informal patients[a] (R)	6.1	0.73	0.89	6.3	0.85	0.97	−0.95	0.341
Depots are only indicated for high levels of psychosis and lack of insight[a] (R)	13.3	1.13	1.07	9.8	1.15	1.07	−0.15	0.880
Depots can be started during the patient's first episode of psychosis[a]	61.9	2.70	1.47	66.4	2.78	1.30	−0.41	0.684
Depots can be indicated for use in non-psychoses[a]	53.1	2.24	1.42	59.9	2.58	1.40	−1.84	0.067
If long-term antipsychotic treatment is indicated, a depot should be considered[a]	68.4	3.01	1.43	71.3	2.97	1.30	0.25	0.800
A stable and well patient on a depot should not be switched to an oral atypical[a]	60.2	2.85	1.43	45.5	2.26	1.44	3.12	0.002
In terms of efficacy, all depots are the same	50.0	2.41	1.40	42.0	2.27	1.29	0.76	0.447
Depots are as efficacious as oral medication in reducing psychopathology	93.9	3.97	0.87	91.4	3.68	0.97	2.36	0.019
Patients receiving a depot seldom require additional long-term oral antipsychotics	61.2	2.83	1.24	50.3	2.50	1.16	2.06	0.040
If a patient does not respond to depot, they are treatment-resistant (R)	4.1	1.04	0.90	8.4	0.90	0.97	1.18	0.238
Women are more likely to gain good symptom control on a depot than men (R)	13.7	1.53	1.00	13.1	1.40	0.92	0.98	0.327
Depots are better at relieving negative symptoms than positive symptoms (R)	3.1	0.96	0.76	5.6	0.89	0.91	0.64	0.520
There is less individual variation in plasma levels with depots than with oral medication	80.4	3.31	1.11	45.7	2.32	1.19	6.44	<0.001

(continued)

Table 1 *(continued)*

	North West England 2006/2007			South East England 2000/2001			t test	*P* value
	Agree (%)	Mean score	SD	Agree (%)	Mean score	SD		
Subscale: Knowledge 1 (*continued*)								
Steady-state plasma levels are achieved 1 week after the first depot injection (R)	13.7	1.24	1.06	25.9	1.63	1.19	−2.63	0.011
Patients on depots should be reviewed every 3 months	47.9	2.46	1.43	70.2	3.14	1.24	−3.80	<0.001
Patients on depots do not need to be reviewed more regularly than twice a year	29.9	1.75	1.41	17.5	1.36	1.22	2.25	0.025
Subscale: Knowledge 2 (side effects)								
Major side effects are more commonly associated with typical depots than typical orals	39.4	2.25	1.25	38.0	2.06	1.17	1.21	0.226
In general, the side effects are worse for depots than oral atypical antipsychotics (R)	56.7	2.68	1.21	86.6	3.73	1.26	−6.39	<0.001
Local inflammation at the injection site is a rare event	33.7	2.16	1.10	35.9	2.27	1.12	−0.72	0.475
Fear of injection is a common reason for patients rejecting depots (R)	84.7	3.44	1.05	69.9	3.01	1.22	2.81	0.005
Depot injections are painful (R)	79.6	3.06	0.87	69.9	2.97	1.06	0.77	0.443
There is an increased risk of tardive dyskinesia with typical depot than oral typicals (R)	51.0	2.42	1.23	44.4	2.36	1.23	0.37	0.714
Major weight gain is a direct consequence of depot medication (R)	49.0	2.50	1.27	67.1	2.83	1.13	−2.04	0.043
For typical depots, test doses are indicated to avoid severe prolonged adverse effects	84.7	3.76	1.12	80.1	3.47	1.39	1.76	0.080
Routine prescribing for anti-parkinsonian medication is indicated for typical depots (R)	14.1	1.43	1.21	9.1	1.15	0.96	1.98	0.049
In an adverse event, a typical depot's long duration of action is a disadvantage	92.9	3.91	1.00	92.2	4.07	0.98	−1.25	0.213
New questions (Knowledge–side effects)								
Routine co-prescribing for anti-parkinsonian medication is indicated for atypical depots	8.2	1.00	1.00	–	–	–	–	–
Depots make people tired and sluggish more so than do oral medication	22.4	1.69	1.04	–	–	–	–	–
Oral medication makes patients feel like a zombie more so than do depots	9.1	1.22	1.00	–	–	–	–	–
Depots allow patients to feel more relaxed more so than do oral medication	33.3	1.97	1.18	–	–	–	–	–
New questions (mostly on patient choice)								
Patients always prefer to have oral medication instead of a depot	33.0	1.92	1.34	–	–	–	–	–
Patients taking medication of their own free choice is more likely for oral than depot	68.0	2.96	1.21	–	–	–	–	–
Patients on depot are more likely to feel ashamed than those on oral medication	34.0	2.00	1.09	–	–	–	–	–
Force is sometimes required when administering a depot	43.3	2.01	1.47	–	–	–	–	–
Threats of enforcing treatment are less likely if a patient is on oral rather than a depot	36.4	1.95	1.19	–	–	–	–	–
Patients feeling they have control of their medication is more likely for oral than depot	71.4	3.26	1.15	–	–	–	–	–
It is easier to control patients if they are on a depot rather than oral medication	69.4	2.92	1.26	–	–	–	–	–
Relapse rates are lower with depots than with oral antipsychotics	75.3	3.09	1.18	–	–	–	–	–

R, reverse scoring applies when scores are summated for subscale analysis.

[a]Items testing prescribing indications.

Mean Likert score for each item given as well as binary categorisation for proportion of sample who agreed with the statement (Likert 0–5, higher value reflects stronger level of agreement).

makes pharmacokinetic sense to initially treat breakthrough psychotic symptoms in LAI patients with oral medication though better symptom control in the long term can be achieved by adjusting the dose of LAI. Patients prescribed LAIs are sometimes excluded from studies on polypharmacy (e.g. Kreyenbuhl, *et al*., 2007) and this needs to be rectified.

Future prescribing choices Only some of the local and national prescribing guidelines, which cover LAI prescribing, have been updated (Moore, *et al*., 2007) and this is increasingly warranted (Kane, *et al*., 1998). In particular, guidance on not using LAIs for pharmacological treatment resistance needs to be clearly stated. This is particularly true when new LAIs become available (Patel, *et al*., 2004; Deslandes, *et al*., 2007; Taylor, *et al*., 2006).

Reasons for prescribing LAIs

Medication adherence Participants' most common reason for prescribing an LAI was a history of poor compliance with oral medication leading to relapse. This is consistent with previous studies which report that clinicians use non-adherence as a key selection criteria for LAI formulations (Lambert, *et al*., 2003; Patel, *et al*., 2003a) and is contrary to claims by Glazer (2007). However, LAIs will not overcome overt non-adherence (when it is known by the clinician that the patient is not taking medication), and this requires an open discussion between the patient and the clinician regarding adherence and associated personal benefits (Patel, *et al*., 2008a).

Wider choice of SGA-LAIs In the previous 2001 study, when only FGA-LAIs were available, psychiatrists reported that having an SGA-LAI would increase LAI prescribing (Kane, *et al*., 2003; Patel, *et al*., 2003a). Two-thirds of our current sample stated that they preferred an SGA-LAI to an FGA-LAI when newly initiating an LAI and reported that the availability of more SGAs available in long-acting formulation would persuade them to prescribe more LAIs. Thus, a consistent finding across the 2001 study and the current study is that psychiatrists want a range of LAIs to choose from. This is in keeping with Heres, *et al.* (2006) who reported that a barrier to LAI prescribing was the patient needing a particular (second generation) antipsychotic which was not available in LAI formulation. It may be that psychiatrists want a similar level of choice for antipsychotic LAIs as they currently have for oral formulations (Mark, 2004).

Attitudes and knowledge

Views on patient preference Half of participants believed that LAIs were less acceptable to patients than oral medication and one-third believed that patients always prefer to have oral medication instead of an LAI. This is a cause for concern. In contrast, several studies report that most patients currently prescribed an LAI are accepting it and many prefer this formulation to oral tablets (Walburn, *et al*., 2001; Wistedt, 1995; Heres, *et al*., 2007). When voluntary outpatients on maintenance antipsychotics are asked about their attitudes to their current medication, those on LAI tended not to express a clear preference, whereas those on oral strongly favoured oral treatment (Patel, *et al*., 2008b). As psychiatrists' personal dislike of injections was not associated directly with attitudes and knowledge about LAIs, it appears that it is the inappropriate over-emphasis of patients' presumed dislike of LAIs that was the key factor. Such assumptions could compromise medication choices offered to patients. This may manifest as oral medication being the default option so that psychiatrists do not routinely include LAI in the choice of medications they initially offer to patients. Thus, the patient is denied the chance to accept/refuse an LAI which can further reinforce the belief that patients always prefer oral medication.

Further, if psychiatrists only prescribe LAIs as the 'last resort', their initiation will often be for legally detained inpatients. Consequently, it would not be surprising if psychiatrists did not always feel confident and competent to include an LAI in the choice of medications that are offered to less ill patients who are able to make an informed choice about their treatment. Heres, *et al.* (2006) noted that older psychiatrists were more likely to offer LAIs to their patients and this may be due to greater experience in using FGA-LAIs (Patel, *et al*., 2003b) before SGA-orals became available. Other reasons for not offering patients LAIs may include practical issues associated with the prescription including refrigerated storage, transport, access for fortnightly contact and the availability of nursing staff colleagues to administer and monitor the LAI.

Side effects Of the four subscales, the lowest score was seen in the side-effects scale. Knowledge about side effects was lower among those participants who reported that their use of LAIs had decreased in the last 5 years versus those who had unchanged or increased rates of LAI use. This may indicate that undue concerns about tolerability act to limit LAI prescribing. This would be consistent with Lambert, *et al*. (2003) who reported that a key barrier to prescribing LAIs was their long-term side effects but this study was conducted before the introduction of an SGA-LAI. Alternatively, it may be that clinicians with more experience of LAIs become more familiar with the management of LAI side effects. We have previously noted that a significant minority of nursing staff seldom asked their patients on LAI about side effects (Patel, *et al*., 2005). Clinicians need to be familiar with the potential side effects of antipsychotics, the differential risk of the specific side effects seen with different drugs and treatment strategies to manage side effects (Haddad and Sharma, 2007).

Coercion and compulsion Prescribing of LAIs was perceived as coercive by a minority of our sample (17%). Nasrallah (2007) argued that a perceived loss of control is often more imagined than real and there are many other areas of everyday

life where patients have ample opportunity to become autonomous without risking psychotic relapse. Nevertheless, we would argue that acts which might lead to perceived coercion should be reviewed and minimised appropriately. Supervised community treatment orders were introduced in England and Wales in autumn 2008, and it is anticipated that LAI prescribing will be used in conjunction with this (Vaughan, *et al*., 2000). Whether supervised community treatment orders lead to increased initiation and continuation of LAI prescribing warrants further research as do the associated ethical issues, particularly as injections which are very long acting are being developed and their duration of action may outlast the legal detention order.

Comparisons for knowledge and attitudes with previous study

Comparison with the previous study (Patel, *et al*., 2003a) highlights that psychiatrists' knowledge and attitudes are relatively stable and consistent in the United Kingdom. In other words, the introduction of an SGA-LAI has not yet led to a major shift in attitudes and knowledge. Changes in attitudes regarding the patient are evident but less so regarding the formulation *per se* and include lessening concerns about stigma and autonomy. LAIs are no longer thought to be as old-fashioned as they were previously. However, concerns regarding acceptance by patients and coercion have changed to a lesser extent and concerns regarding patient fear have increased. Despite these changes, attitudes remain positively associated with degree of knowledge regarding LAIs.

Future directions

During the previous 5 years, reported LAI prescribing rates have decreased despite most participants believing that LAIs are associated with better adherence and lower relapse rates than oral medication. This paradox has been noted by other commentators (Glazer, 2007). Some attitudes have changed since a previous study in 2001 and these mainly encompass aspects regarding the patient rather than the LAI and include reduced concerns about stigma and autonomy. However, concerns about patient acceptance continue and some participants hold negative views that are not consistent with the evidence base. Such clinician concerns are important but, if extreme, could compromise medication choices offered to patients. As more SGA-LAIs are made available to prescribers, it remains to be seen whether attitudes and knowledge will change. In part, attitudes regarding LAIs may be influenced if future research, which is sorely needed, is conducted to determine whether LAI formulations are more effective in the long-term than oral formulations and also for head-to-head studies between FGA-LAIs and SGA-LAIs. Further, our study confirms that the FGA-LAI comparator needs to be chosen carefully in terms of the drug and dose to allow for a meaningful comparison and to maximise impact on future prescribing guidelines. Others might already consider a high-potency FGA-LAI (e.g., haloperidol decanoate) to be an inappropriate comparator due to the high incidence of extrapyramidal symptoms (Haddad and Dursun, 2006). In this study, we enquired about the most frequently initiated LAI in the last year and only one participant reported that this was haloperidol decanoate. Therefore, although haloperidol is the most commonly used FGA-LAI in some countries, this appears not to be the case for the United Kingdom (amongst others) and so international generalisation of any future study of haloperidol decanoate would be problematic.

Conclusions

Reported antipsychotic LAI prescribing rates have decreased in 5 years despite an SGA-LAI becoming available and most clinicians regarding LAIs as effective. Attitudes and knowledge regarding LAIs have remained fairly stable and consistent in the United Kingdom during this time period except for attitudes regarding the patients who are prescribed LAIs, which improved. Concerns about stigma and autonomy in relation to LAI use have decreased compared with a previous study, whereas concerns about patient acceptance continue as do negative views about some aspects of LAI use. Both may compromise medication choices offered to patients.

The new guidelines regarding schizophrenia (NICE, 2009) state that the clinician should 'consider offering depot/long-acting injectable antipsychotic medication to people with schizophrenia: (1) who would prefer such treatment after an acute episode and (2) where avoiding covert non-adherence (either intentional or unintentional) to antipsychotic medication is a clinical priority within the treatment plan'. Here, the understanding that depots do not in themselves overcome overt non-adherence is self-evident. Interestingly, the option of patient preference is now also explicitly stated.

At a practical level, psychiatrists need to be confident and competent in presenting patients with sufficient information to enable them to make an informed choice about whether to accept oral or LAI medication or neither. In relation to prescribing, it is not the presence or absence of a needle that determines the quality of the doctor-patient relationship or the degree of patient autonomy. Rather, the psychiatrist should focus on the process of shared decision making with meaningful patient involvement and a true choice of suitable medication options, including LAIs where appropriate. These discussions require specific skills, adequate time and need to be tailored to the individual patient.

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