

Financial incentives to improve adherence to antipsychotic maintenance medication in non-adherent patients: a cluster randomised controlled trial

Stefan Priebe,^{1*} Stephen A Bremner,²
Christoph Lauber,³ Catherine Henderson⁴
and Tom Burns⁵ on behalf of the FIAT (Financial
Incentives for Adherence to Treatment) research team

¹Unit for Social and Community Psychiatry, World Health Organization
Collaborating Centre for Mental Health Services Development, Queen Mary
University of London, London, UK

²Division of Primary Care and Public Health, Brighton and Sussex Medical School,
Mayfield House, University of Brighton, Brighton, UK

³Services Psychiatriques, Jura bernois, Bienne-Seeland, Bellelay, Switzerland

⁴Department of Social Policy, London School of Economics and Political Science,
London, UK

⁵Department of Psychiatry, University of Oxford, Warneford Hospital, Oxford, UK

*Corresponding author

Declared competing interests of authors: Professor Priebe is on the Health Technology Assessment programme Mental, Psychological and Occupational Health Panel.

Published September 2016

DOI: 10.3310/hta20700

Scientific summary

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Health Technology Assessment 2016; Vol. 20: No. 70

DOI: 10.3310/hta20700

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Scientific summary

Background

Poor adherence to long-term antipsychotic injectable (LAI) medication for patients with psychotic disorders remains a significant problem within mental health care, with the cost of non-adherence having implications on both an individual (relapse, rehospitalisation, increased suicide risk and poorer subjective quality of life) and societal levels (increased health-care costs).

Despite interventions developed to improve adherence, there is little evidence suggesting which intervention is most effective. Financial incentives have demonstrated some effectiveness in improving adherence to medication/treatment in both general and mental health care. Furthermore, a recent pilot study within the UK found financial incentives to be effective in improving LAI medication adherence and reducing the number of hospital admissions. So far, no wider research on the use of financial incentives to improve LAI medication adherence has been investigated.

The use of financial incentives to improve adherence levels to LAI medication is a contentious issue, with a range of concerns. To address these concerns, focus groups with stakeholders (including patients and patient forum representatives, carers, consultant and trainee psychiatrists, nurses, occupational therapists, social workers, psychologists, mental health team managers, voluntary organisation representatives and health economists) were carried out prior to the trial. High consensus of concerns was identified across groups. Among other concerns, such as the practicalities of the practice, the impact on the therapeutic relationship or issues of ethical nature such as fairness, or coercion, stakeholders felt that it is crucial that research evaluates whether or not offering financial incentives is effective. Furthermore, it is important to understand the experiences of the clinicians and patients offering the incentives to determine whether or not the concerns highlighted by these groups would be borne out if financial incentives were offered in practice.

Objectives

- To test the clinical effectiveness and cost-effectiveness of offering financial incentives to patients with psychotic disorders who demonstrate poor adherence to LAI medication (i.e. receiving $\leq 75\%$ of LAI medication out of all the LAI medication that a patient was prescribed).
- To test the short- and long-term impact of being offered financial incentives once those were discontinued, that is, 6 months and 24 months after the end of the intervention.
- To establish the views and experiences of both patients and clinicians with offering financial incentives to improve adherence to LAI medication.

Method

The study was a cluster randomised controlled trial. Mental health teams [assertive outreach teams (AOTs) and Community Mental Health Teams] were recruited and identified patients with schizophrenia and other psychotic disorders who showed poor adherence to their LAI medication ($\leq 75\%$ adherence). After patients were recruited, teams were randomly allocated to the intervention group, in which patients received financial incentives (£15 per LAI medication) over a 12-month period, or to continue treatment as usual with no incentives, with equal probability to the intervention or control group, and stratified by levels of socioeconomic deprivation as it was assumed that teams in areas with higher deprivation would have more eligible (and more challenging) patients.

Participants

Patients were eligible for the trial if they were aged between 18 and 65 years, had an established diagnosis of schizophrenia, schizoaffective psychosis or bipolar illness (according to the *International Classification of Diseases*, Tenth Edition), were cared for by a mental health team for at least 4 months, had the capacity to give informed consent, were being prescribed LAI medication and had shown poor adherence to LAI medication ($\leq 75\%$ adherence). Patients were not included in the trial if they had a learning difficulty or poor command of English.

Procedure

Community Mental Health Teams and AOTs were approached and teams interested in the study were visited by research assistants (RAs). Written informed consent was provided by the team manager, consultant psychiatrist, or both. Once a team consented to take part in the study, patients' responsible clinicians approached eligible patients. If patients expressed interest to learn more about the study, a meeting was arranged in which a RA explained the study in more detail. If written informed consent was provided, patients completed a short questionnaire rating their subjective quality of life. After all eligible patients in a team had been contacted and consent obtained, the team was randomised and a researcher later informed them of their allocation.

For teams allocated to the intervention group, RAs visited the teams to further explain the procedure of the incentives and to provide the required money for the intervention period. Over the course of 12 months, patients within the intervention group received £15 each time they attended an appointment for their LAI medication, which was signed for by both the nurse administering the medication and the patient. Teams allocated to the intervention group received treatment as usual, with no incentives.

Data were collected from electronic databases or patients' paper notes at baseline, at the end of the intervention and 6 months after the intervention ended. In addition, patients and clinicians were contacted at the end of the intervention to rate their subjective quality of life and to complete the Clinical Global Impression (CGI) scale, respectively. Qualitative interviews were carried out with a convenient sample of patients in the intervention group. Attempts were made to contact all clinicians of patients in the intervention group to complete a semistructured interview about their experiences with the intervention.

Outcome measures

The study aimed to assess outcomes at baseline (up to 12 months prior to randomisation), at the end of the 12-month intervention and at the 6-month follow-up. These were as follows:

- Primary outcome: adherence to LAI medication – defined as the percentage of LAI medication received out of those prescribed over a 12-month period. Calculating adherence also took into account periods when LAI medication would not be received in the community (e.g. hospitalisation or imprisonment). This was assessed at baseline (up to 12 months prior to intervention), at the end of intervention and at the 6-month follow-up.
- Secondary outcomes: percentage of patients with adherence of at least 95%; time slippage; patients' clinical improvement (using the CGI scale); patients' subjective quality of life (using the DIALOG scale); satisfaction with medication; hospitalisation; and adverse events. All secondary outcomes were assessed at baseline and at the end of intervention, with all but clinical global improvement, subjective quality of life and treatment satisfaction also being assessed at the 6-month follow-up.
- Cost-effectiveness: incremental cost per patient of improving adherence by 20% and incremental cost per patient of achieving at least 95% adherence over the intervention period. Health-care costs were

calculated at baseline (costs over the prior 12 months), end of intervention (costs over the prior 12 months) and at a 6-month follow-up (costs over the prior 6 months).

- Interviews: interviews with clinicians of patients allocated to the intervention group were carried out during the intervention (at 6 months and 12 months), and at the 6-month follow-up to assess their experiences with offering financial incentives. Interviews with patients allocated to the intervention were conducted at the end of the intervention to explore the experiences of receiving financial incentives.

Follow-on study

The trial was granted permission by the Health Technology Assessment programme to extend the project for a further 19 months to assess whether or not financial incentives were continued with patients and to examine the longer-term impact of the financial incentives on adherence and other outcomes. This extension included following up teams and patients for a further 18 months after the 6-month follow-up period that was part of the original protocol (i.e. 24 months after the end of the intervention). Outcomes measured included the primary outcome (adherence) and fewer secondary outcomes (patients with at least 95% adherence, hospitalisation and adverse events only). Follow-up interviews were conducted with patients at 24 months to address how the incentives influenced adherence in the long term, and how patients experienced the use of financial incentives and their ending after the intervention period. Follow-up interviews were conducted with clinicians at 24 months to assess whether or not financial incentives had been continued, reasons for/against continuation and the long-term impact of the incentives and the stopping of the incentives on patient adherence, the therapeutic relationship and other outcomes.

Statistical analyses

The primary outcome was analysed using a linear mixed-effects model with a random effect for mental health team. In the main analysis, patients who had at least 4 months' complete adherence data at baseline and at end of intervention were included. Separate analyses were carried out excluding patients not meeting this inclusion criterion, for patients with protocol violations for diagnoses or who were found to be at least 75% adherent in the 4 months prior to screening for eligibility.

Further sensitivity analyses were conducted without adjusting for baseline adherence, for patients only with a diagnosis of schizophrenia and excluding patients who were at least 75% adherent throughout the whole baseline period (as opposed to at least 4 months prior).

Secondary outcomes (i.e. achieving adherence of at least 95%) were analysed using mixed-effects logistic regression models. Subjective quality of life was analysed using a random-effects model fitted by generalised least squares. Hospital admissions and adverse events were reported descriptively as these were expected to be infrequent. For all regression analyses, all models adjusted for the deprivation stratification variable, average time in weeks between prescribed LAI medication at baseline and where possible, for baseline measures of outcomes (excluding clinical global improvement which was assessed at end of intervention only).

Cost-effectiveness analyses fitted multilevel multivariate models with a random effect for mental health team.

Results

In total, 73 mental health teams (24 assertive outreach, 48 community mental health and one recovery team) across 29 different NHS trusts were recruited and 141 patients across these teams were consented into the trial. Thirty-seven teams were randomised to the intervention ($n = 78$ patients) and 36 teams were randomised to the control condition ($n = 63$ patients). Patients in the trial had a mean age of 43.7 years (standard deviation 9.8 years), 74% were male and 80% of patients had been diagnosed with schizophrenia.

End of intervention

Primary outcome data were available for 35 intervention teams with 75 patients and for 31 control teams with 56 patients.

Primary outcome

The average adherence level at baseline was 69% in the intervention group and 67% in the control group. At the end of the intervention, adherence was 85% in the intervention group and 71% in the control group. Adherence was significantly higher in the intervention group than in the control group during the 1-year intervention period [adjusted difference in means 11.5%, 95% confidence interval (CI) 3.9% to 19.0%; $p = 0.003$].

Secondary outcome

Adherence levels of at least 95% were achieved in 28% of the intervention group and 5% of the control group (adjusted odds ratio 8.21, 95% CI 2.00 to 33.67; $p = 0.003$). Patients in the intervention group reported significantly less of time slippage (mean difference -19.5% , 95% CI -29.8% to -9.3% ; $p < 0.001$); more favourable subjective quality of life (adjusted difference in means 0.71, 95% CI 0.26 to 1.15; $p = 0.002$). No statistically significant differences in the clinical improvement scale. Satisfaction with medication, hospital admissions and adverse events were found to be similar between groups.

Six-month follow-up

Primary outcome data were available for 106 patients. Adherence in the intervention group had fallen to 71% compared with 78% in the control group; however, the difference between groups was not statistically significant (adjusted difference in means -7.4% , 95% CI -17.0% to 2.1% ; $p = 0.127$). There were no statistically significant differences between groups in the proportion of patients reaching adherence levels of at least 95% or in time slippage. No differences were found in the number of hospital admissions and adverse events.

Twenty-four-month follow-up

Primary outcome data were available for 116 patients. Adherence in the intervention group was 68% compared with 74% in the control group. The difference between the two groups at the 24-month follow-up was not statistically significant (difference in means -5.7% , 95% CI -13.1% to 1.7% ; $p = 0.130$).

Cost-effectiveness

Costs and outcome data were available for 117 patients at baseline and end of intervention. The average cost of the financial incentive was £303 (standard error £12). At the end of intervention, the total costs (including the costs of the financial incentive), adjusted for covariates and clustering, of patients in the intervention group were not significantly higher than costs of patients in the control group (adjusted cost difference £598, 95% CI $-£4533$ to $£5730$; $p = 0.818$).

Patient interviews

Interviews were conducted with 45 of the 78 patients allocated to the intervention group, with 11 patients interviewed both at the end of intervention and at the 24-month follow-up. All patients felt that the incentives acted as a motivator or reward for receiving their LAI medication; however, many patients highlighted a range of personal dilemmas that arose for them as a result of being offered the incentives. The majority of patients felt that the incentives being discontinued did not have a negative impact on them.

Clinician interviews

Interviews were conducted during the intervention period (at 6 months and at 12 months) with 59 clinicians for 73 out of 78 patients allocated to the intervention. For 77% of the patients, clinicians reported the benefits of the incentives on clinical management through improved adherence, contact, patient monitoring, communication and trust. Clinicians also reported improvements in insight, mental health and social functioning. For 33% of patients, clinicians reported problems in patient management as a result of the incentives, such as increased drug and alcohol use and the monetisation of the therapeutic relationship.

Interviews after the end of the intervention (6- and 24-month follow-ups) were conducted with 57 clinicians of 59 of the 78 patients. No clinicians continued to use the incentives with patients who had participated in the trial, or with any new patients, with financial constraints being the most common reason as to why the incentives were discontinued. The majority of clinicians reported no negative impact once the incentives were stopped; however, there were reports of a small number of patients whose adherence and mental health, and their relationship with clinicians, had deteriorated as a result. The majority of clinicians expressed positive opinions over the use of financial incentives, both before and after the intervention ended. Around one-fifth had negative opinions over the use of incentives and another one-fifth had mixed opinions.

Conclusions

Offering financial incentives was an effective and cost-effective method of improving adherence in patients with psychosis who demonstrate poor adherence to LAI medication. However, once the incentives were discontinued, patients' adherence returned to the original pattern. Patients' views of and experiences with the intervention were somewhat more positive than those of clinicians. However, both patients' and clinicians' reports were largely positive and extended beyond the monetary value of the incentives. However, some problematic experiences both during the intervention period and afterwards were also found and often coexisted along with positive views. Whether or not financial incentives are effective for patients with more favourable background, those on oral medication or for shorter or longer time periods remains unknown.

Trial registration

This trial is registered as ISRCTN77769281.

Funding

Funding for this study was provided by the Health Technology Assessment programme of the National Institute for Health Research.

ISSN 1366-5278 (Print)

ISSN 2046-4924 (Online)

Impact factor: 4.058

Health Technology Assessment is indexed in MEDLINE, CINAHL, EMBASE, The Cochrane Library and the ISI Science Citation Index.

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This report

The research reported in this issue of the journal was funded by the HTA programme as project number 07/60/43. The contractual start date was in September 2009. The draft report began editorial review in May 2015 and was accepted for publication in October 2015. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HTA editors and publisher have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the draft document. However, they do not accept liability for damages or losses arising from material published in this report.

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