Drug and Alcohol Dependence 133 (2013) 494–501

Contents lists available at ScienceDirect

Drug and Alcohol Dependence

journal homepage: www.elsevier.com/locate/drugalcdep

Economic evaluation: A comparison of methadone versus buprenorphine for opiate substitution treatment☆

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ARTICLE INFO

Article history:
Received 23 May 2013
Received in revised form 20 June 2013
Accepted 10 July 2013
Available online 17 August 2013

Keywords:
Buprenorphine
Methadone
Substitution
Treatment
Cost effectiveness

ABSTRACT

Background: The cost of opiate substitution is usually considered lower in cost when methadone is used, as compared to that of buprenorphine, however the overall cost effectiveness of substitution programmes comparing the two drugs remains largely unknown.
Methods: We evaluated the treatment cost and effectiveness of methadone and buprenorphine when used in an opiate substitution programme in Norfolk, UK. All programme costs, estimated from the perspective of the drug treatment clinic, were collected on 361 opiate-dependent participants over a six-month period. Total costs comprised medication (methadone or buprenorphine) costs, pharmacy supervision and dispensing costs, and drug service clinic costs. Effectiveness was measured in terms of (1) each programmes ability to retain participants in the programme for six months, and (2) the ability of the programme to accomplish complete abstinence from illicit opiate consumption.
Results: Overall, mean medication-only costs of methadone were lower than that of buprenorphine, however, pharmacy and clinic costs were lower for the buprenorphine programme. The covariate-adjusted mean total cost of the two programmes was not significantly different. Mean six-month retention rates were higher on the methadone programme, therefore, the methadone programme "dominates" the buprenorphine programme as it was slightly more effective for the same cost. Conversely, when ability to stop taking illicit opiates concomitant with opiate substitution medication was considered, the buprenorphine programme was more effective with an additional cost of £903 per individual who stopped illicit opiate use.
Conclusions: The provision of buprenorphine should be considered an appropriate treatment if cessation of illicit opiate use, concomitant with programme retention is considered an important outcome.

1. Introduction

The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), estimated that there were 400,000 problem drug users in the UK in 2009 (EMCDDA, 2010). Of the approximately 140,000 who entered some form of drug treatment programme during that year, 61% were addicted to some form of opiate (EMCDDA, 2010). During the same year there were 2481 recorded drug-related deaths, of which 79% were males (EMCDDA, 2010). The negative consequences of opiate dependence in the UK, are reduced by using either methadone (MST) or buprenorphine (BST) substitution treatment programmes (National Institute for Health and Clinical Excellence (NICE), 2010). Current NICE guidance (2010) recommends that both drugs be made available, with a preference for methadone administration based on evidence from existing comparative trials (Mattick et al., 2008) and the reduced cost of the drug.

Previous authors have suggested that the apparent inferiority of buprenorphine, in terms of retention of the participant in the programme, could be related to administration of relatively low doses of buprenorphine and slow inflexible induction phase of previous studies (Pinto et al., 2010). The clinical study, upon which this economic analysis is based, attempted to overcome this compromise by getting participants on a stable dosage within three days (Pinto et al., 2010). Several previous studies have included some form of health economic component however the methods, and perspectives varied considerably. The total drug cost of BST treatment as compared to that of MST were found to be lower in some cases (Barnett, 2009; Harris et al., 2005; Shanahan et al., 2006), but increased in others (Colombo et al., 2003). Extending a BST treatment from eight to sixteen months was also estimated

☆ Supplementary material can be found by accessing the online version of this paper. Please see Appendix A.

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http://dx.doi.org/10.1016/j.drugalcdep.2013.07.018

to be significantly more beneficial, in terms of marginal cost benefit ratio and thus cost-effectiveness to the NHS, when compared to an extended MST programme (Russell and McKeganey, 2013). The comparative efficacy of the two drugs also varied with several studies finding BST to be superior (Barnett, 2009; Colombo et al., 2003; Maremmani and Gerra, 2010; Shanahan et al., 2006), inferior (Connock et al., 2007; Mattick et al., 2008), or of equal efficacy (Harris et al., 2005). A BST programme was also found to be superior to that of MST when treating opiate-dependence during pregnancy (Fowler et al., 2013).

A recent policy change in the UK to "payment by results" (Maynard et al., 2011) has changed the performance targets and measurement of outcomes from payment for retaining participants in a programme only, to targets of retaining participants in a programme, concomitant with abstinence from illicit drug use while in the programme. Therefore the economic consequences, in terms of several outcome measures require consideration. Conclusive evidence of the economic consequences of utilising these two drugs is currently unclear, necessitating a full economic analysis. Therefore we seek to compare the cost effectiveness of BST and MST treatment programmes in terms of: (1) their ability to retain participants in an opiate substitution programme; (2) their ability to facilitate illicit opiate abstinence in addition to being retained in an opiate substitution treatment.

2. Methods

2.1. Participants

Throughout, we use data from a previous clinical study, the clinical outcomes of which have been reported elsewhere (Pinto et al., 2010). Participants were recruited between October 2005 and October 2007 from one rural and two urban community drug service clinics in Norfolk, operated by the then Norfolk and Waveney Mental Health Trust Alcohol and Drugs Service (TADS). All enrolled participants had requested opiate substitution treatment, were opiate-dependent based on clinical assessment of urine toxicology screens, and had not been prescribed either buprenorphine or methadone during the preceding month. The severity of dependence was evaluated using the ONS scale (Singleton et al., 2003; Uddin et al., 2011). The primary outcome of the clinical study was to quantify the success of each opiate substitution programme in terms of retaining participants in the programme for a minimum of six months.

2.2. Interventions

The interventions have been fully described previously (Pinto et al., 2010). Participants voluntarily chose either methadone or buprenorphine in collaboration with the treating clinician. Induction on their drug of choice occurred over an initial dosage titration period of three days. Following the three-day dosage titration period, participants continued to receive medication under pharmacy supervised consumption or were allowed take-home doses on an individual basis when it was felt appropriate and safe to do so. Daily dosage increase or decrease could be negotiated with the treating clinician at any point. Participants were able to receive regular contact with clinic personnel dependent on need; the level of contact was negotiated between the clinic staff and the participant. Additionally, all participants were offered counselling and support.

2.3. Clinical outcomes

The primary clinical outcome of the study was comprised of two parts. Each participant was judged successful (retained) if the participant remained in treatment with the TADS clinic for the complete six-month study period, or detoxed completely from both opiate substitution prescription drugs and illicit opiates prior to the six-month study completion. Therefore a failed result (not retained) was assigned if the participant dropped out of the programme prior to the six-month period (Pinto et al., 2010). Retained participants were monitored monthly by urine drug testing, to determine if they continued illicit opiate use in addition to the prescribed medication. Therefore the successful group were further subdivided into those who did, or did not continue to use illicit opiates concomitantly with the substitution study prescribed medication. The successful group were also subdivided and analysed by motivation to participate, whether the participant attended the TADS clinic voluntarily or was directed to do so by the Criminal Justice Service (CJS) system, to determine if motivation to participate had an effect on the choice of substitution programme, the efficacy, or cost of each opiate substitution programme.

Table 1
Mean daily pharmacy cost of supervising and dispensing medications, by individual dispensing regimens.

Dispensing regime	MST	BST
Daily supervision controlled regimen	£2.77	£2.46
Daily to take out regimen	£1.58	£0.95
Thrice weekly to take out regimen	£0.95	£0.57
Twice weekly to take out regimen	£0.63	£0.38
Weekly to take out regimen	£0.32	£0.19

2.4. Programme costs

Costs were calculated on a per participant basis for four cost categories including: (1) cost of medication (methadone or buprenorphine); (2) cost of supervising and dispensing medication at the pharmacy; (3) costs of personnel contacts and urine drug testing at the TADS clinic; (4) total costs. The individual costs from the first three categories were summed to calculate total costs to the clinic for the complete six-month study period, inclusive of titration period. All costs are estimated in UK sterling (£) at 2010–2011 financial year therefore no discounting was required because the time period is less than one year.

2.4.1. Medication costs. All prescribed medication dosages were recorded. The costs of both medications were derived from the NHS England and Wales electronic drug tariff of September 2010 (National Health Service England and Wales, 2010).

2.4.2. Pharmacy supervision and dispensing regimen costs. The dispensing regimen each participant was on, and how it was altered, was recorded throughout the study period. Individual daily medication dosages were dispensed, at the choice of the prescribing doctor, in one of five different dispensing regimens comprised of: (1) daily supervised consumption within the pharmacy; (2) dose to-take-away, daily; (3) dosage to to-take-away, thrice per week; (4) dosage to-take-away, twice per week; (5) dosage to-take-away, weekly (see Table 1). Costs allocated to the TADS clinic, but incurred at the pharmacy dispensing the medication, included dispensing fees, controlled drug fees and supervision fees; additionally in the case of methadone, a container fee. These fees were all charged at the 2010 rates for Norfolk. Fees were locally set but were broadly similar to those of all areas of the UK.

2.4.3. TADS clinic contact numbers, urine test numbers, and costs. The number of contacts between each participant and each type of individual healthcare professional at the TADS clinic, during the initial drug level titration period and the subsequent study period was recorded, except for those participants directed to attend by the CJS (see Table 2). The average time required per contact was estimated from previous TADS data and the cost per unit of time was acquired from Unit Costs of Health and Social Care statistics (Curtis, 2011). These data were used to calculate the cost of each individual TADS clinic contact.

Data were not recorded for the CJS directed participants because they were assigned attendance dates by the court according to the CJS programme they were enrolled in. Therefore these contact numbers were estimated by the clinical colleagues who saw the participants on a regular basis using standard attendance rates. All participant meetings with nurses, support workers, duty workers, consultant drug misuse specialist doctors, and non-consultant drug misuse specialist doctors were recorded as were the number of missed appointments, phone calls from the clinic to participants, and urine test numbers. Total clinic contact cost per participant was calculated as the product of the total number of contacts per participant and the appropriate contact time cost from the Unit Costs of Health and Social Care statistics (Curtis, 2011). The total cost of urine testing was calculated as the product of number of tests and the cost of an individual test.

2.4.4. Total costs. Total costs per participant were calculated as the sum of costs of medication, pharmacy supervision and dispensing costs, and TADS clinic costs.

2.5. Subgroup analyses

In the main group analysis, costs of the programme of the retained group were compared to those of the not-retained group. The costs were also compared for those who attended the clinic voluntarily versus those who were directed to attend by the CJS. For subgroup analyses, treatment programme costs for the retained group were further divided into those participants who continued to use or stopped using illicit opiates.

2.6. Cost analyses

Cost analysis was done independently for each for the four categories described in Section 2.4. Analyses were done initially on unadjusted data to produce raw mean values for all subgroups. In the clinical trial, patients selected their drug programme of choice, thus treatment groups were not randomised. Preliminary analysis of the total cost data suggested that it was negatively skewed, with a substantial number