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Using behavioral economic theory to increase use of effective contraceptives among opioid-maintained women at risk of unintended pregnancy

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ABSTRACT

Objective. An unsettling aspect of the US opioid epidemic is the high rate of in utero exposure, especially since most of these pregnancies are unintended, due in part to low rates of effective contraceptive use among opioid-using women. This study tested an intervention informed by behavioral economic theory and aimed at promoting effective contraceptive use among opioid-maintained women at risk of unintended pregnancy in the Burlington, VT, area between 2011 and 2013.

Methods. Thirty-one women were assigned (initial 5 consecutively, subsequent 26 randomly) to either usual care or an experimental intervention. Participants in usual care received condoms, a dose of emergency contraception, and referral to local providers. Participants in the experimental condition received usual care plus the World Health Organization's contraception initiation protocol, including free prescription contraceptives, and financial incentives for attending 13 follow-up visits over 6 months to help manage side effects and other issues.

Results. Significantly more women in the experimental vs. usual care control conditions initiated prescription contraceptive use (100% vs. 29%) and reported prescription contraceptive use at 1-month (63% vs. 13%), 3-month (88% vs. 20%), and 6-month (94% vs. 13%) assessments. None of the experimental condition participants became pregnant during the 6-month protocol vs. three women (20%) in the control condition.

Conclusions. These results provide the first experimental evidence supporting the efficacy of an intervention for increasing prescription contraceptive use among opioid-maintained women at risk of unintended pregnancy.

A particularly unsettling aspect of the current US opioid epidemic is the high rate of in utero exposure and associated adverse health and economic outcomes, with the cost of acute medical care for these opioid-exposed neonates estimated at nearly $67,000 per infant (Patrick et al., 2015). Further, nearly 80% of these pregnancies are unintended (Black et al., 2012; Burns et al., 2011; Heil et al., 2011; Jones et al., 2011) due in part to alarmingly low rates of effective contraceptive use among opioid-using women (<10%; see review by Terplan et al., 2015).

One important but under-researched approach to reducing this problem is increasing the use of more effective contraceptives among opioid-dependent women at risk of unintended pregnancy. We know of no controlled studies on promoting effective contraceptive use in this vulnerable population. There have been many interventions aimed at increasing condom use to reduce HIV and other sexually transmitted infections (STIs), but results have been modest (see meta analyses by Semaan et al., 2002 and Copenhaver et al., 2006), and coital methods like condoms are only moderately effective contraceptives (15% pregnancy rate with typical use in the first year; World Health Organization (WHO), 2007). Behavioral economic theory suggests at least one important contributor to their lesser efficacy: condoms are used at the time of intercourse, when sexual arousal increases impulsive choice, undermining men's intentions to use condoms (Ariely and Lowenstein, 2006). By contrast, choices regarding use of the more effective prescription contraceptives (birth control pills, patch, ring, injection, intrauterine devices (IUDs), and implants, with an average 4% pregnancy rate; WHO, 2007) are made temporally distant from intercourse and are thus more likely to be made with a rational eye toward longer-term outcomes. However, it requires substantially more effort to initiate prescription contraceptives. Women need to find a provider they are comfortable with and schedule and attend an appointment

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with that provider. At the appointment, women are often required to undergo examinations or tests that are not necessary to safely prescribe contraceptives (e.g., pelvic exam, Pap smear; Henderson et al., 2010). In addition, out-of-pocket expenses for such appointments average $40 (Davis and Carper, 2012). Women who choose an IUD or implant are frequently required to schedule an additional visit to have the method inserted for administrative reasons (e.g., insurance policies, outdated STI testing protocols; Bergin et al., 2012). Those who choose pills, patch, or ring are often instructed to wait for menses to start the method despite the demonstrated safety and efficacy of "quick start" protocols that allow most women to start immediately (see review by Brahmi and Curtis, 2013). Once a prescription contraceptive method is initiated, women may also face difficulties in continuing it. Side effects such as bleeding irregularities are the most common reason women discontinue prescription contraceptives (Daniels et al., 2013; Grunloh et al., 2013). Women who choose pills, patch, or ring are also often required to refill prescriptions at frequent intervals and these methods plus injections require women to manage use (e.g., taking a pill, changing a patch or ring, returning to the provider for the next injection). In addition, out-of-pocket costs across such methods average $9/month (Becker and Polsky, 2015).

The present study tested an intervention informed by behavioral economic theory and aimed at promoting more effective contraceptive use among opioid-maintained women at risk of unintended pregnancy. Even among maintained women, unintended pregnancy rates average 77% (Black et al., 2012; Welle-Strand et al., 2013) and use of effective contraceptives is low (36%; Black et al., 2012; Harding and Ritchie, 2003; Morrison et al., 1995; Ralph and Spigner, 1986). The intervention had two components. The first component, the WHO's Decision-Making Tool for Family Planning Clients and Providers (WHO and Johns Hopkins Bloomberg School of Public Health, 2005), aimed to promote contraceptive initiation. Many of the elements incorporated into the WHO's Decision-Making Tool, such as providing contraception without requiring a physical exam and dispensing/inserting the chosen method at the same visit, are consistent with the behavioral economic strategy of reducing barriers to initiating healthier behaviors. The second component of the intervention, financial incentives provided contingent on attendance at follow-up visits, aimed to promote prescription contraceptive continuation. Financial incentives are a widely used behavioral economic strategy that has been reliably shown to increase attendance at counseling sessions, medical appointments, and other health-related appointments among substance abusers (see meta-analysis by Lussier et al., 2006). In the present study, increasing attendance at follow-up visits gave staff an opportunity to help participants manage contraceptive side effects and problem-solve adherence problems, provide free refills of the chosen contraceptive method, and assist with switching methods when indicated. In addition, the intervention was delivered in a clinic that was co-located with an agonist maintenance clinic in an effort to further reduce barriers to healthy choices. This report describes results obtained in a preliminary controlled trial examining the efficacy of this treatment.

1. Methods

1.1. Participants

Potential participants were recruited in and around opioid maintenance treatment programs in the greater Burlington, VT, area between October 2011 and September 2013. Participants were screened for initial eligibility via a study prescreen completed by phone or in person, followed by an in-person screen. This screen included demographic, general medical history, and reproductive history questionnaires developed in our clinic and a urine pregnancy test. A modified version of the Time-Line Followback (TLFB) interview adapted to assess sexual activity and contraceptive use was used to collect this information for the 90 days prior to screening (Weinhardt, 2002; Weinhardt et al., 1998). The screen also included a 32-item survey designed to assess knowledge, attitudes, and beliefs regarding pregnancy risk and contraceptive methods (The National Campaign to Prevent Teen and Unplanned Pregnancy, 2008). Other instruments included in the screen were the Addiction Severity Index—Fifth Edition (McLellan et al., 1992; Makela, 2004), Risk Assessment Battery—sexual practices section only (University of Pennsylvania HIV/AIDS Prevention Research Division, 1995), Beck Depression Inventory (Beck et al., 1961, 1988), Barrett Impulsivity Scale Version 11 (Patton et al., 1995; Stanford et al., 2009), and computerized measures of delay discounting (Johnson and Bickel, 2002; Johnson and Bruner, 2012, 2013; Kowal et al., 2007; Richards et al., 1999). Potential participants were compensated $35 for completing the screen.

Women who were eligible for the study (1) were between 18 and 44 years of age; (2) were pre-menopausal and had no history of a tubal ligation or hysterectomy; (3) had had heterosexual vaginal intercourse in the past 3 months; (4) were at least 6 months postpartum since their last pregnancy; (5) were not planning to become pregnant in the next 6 months; (6) were medically eligible to use prescription contraceptives; (7) reported no use of birth control pills, patch, ring, implants, or IUDs in the last 7 days or no depot injections in the last 3 months; (8) were in opioid maintenance treatment for at least the past 30 days; (9) were not facing imminent incarceration; and (10) were English-speaking. All participants provided written informed consent, and the study was approved by the University of Vermont Institutional Review Board.

1.2. Procedures

1.2.1. Conditions

1.2.1.1. Usual care control. Participants assigned to the usual care control condition received an informational booklet about birth control methods (Planned Parenthood's "Facts About Birth Control") and a list of nearby providers of contraceptive services. Participants in this condition were also offered condoms and a dose of emergency contraception (i.e., Plan B or ella).

2. Experimental

Participants in the experimental condition received the same treatment as the usual care control condition, but with two additional components. Regarding the first component, participants in the experimental condition met with an advanced practice registered nurse after their screening assessment. Using the World Health Organization's (WHO) Contraceptive Decision-Making Tool for Family Planning Clients and Providers as a guide, the participant and nurse practitioner worked to come to a mutual decision regarding the best contraceptive method for the participant's current circumstances. Participants could choose oral contraceptive pills, Ortho Evra transdermal patches, NuvaRing vaginal ring, depot medroxyprogesterone acetate (DMPA) intramuscular injection, IUD (i.e., Mirena or ParaGard), or subcutaneous implant (i.e., Implanon or Nexplanon). While diaphragms are prescription contraceptives, they were not offered to participants due to their relatively high pregnancy rate (16%; WHO, 2007). Participants who decided to initiate a prescription contraceptive were provided with educational counseling about their chosen method and were given the method at no cost. Pills, patches, and rings were dispensed immediately and participants were encouraged to initiate these methods in the clinic. Injections were administered immediately by study medical personnel. For IUDs or implants, arrangements were made for the insertion to be performed by study medical personnel at a nearby university-affiliated clinic as soon as possible (median delay of 17 days). Regarding the second component, participants in the experimental condition were scheduled to attend 13 follow-up visits over the next 6 months. At follow-up visits, a urine pregnancy test was performed and participants

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