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A treatment for substance abusing pregnant women

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Abstract

We describe the adaptation of a manualized behavioral treatment for substance using pregnant women that includes components of motivational interviewing and cognitive therapy. In a pilot study conducted in 2006–2007, five non-behavioral health clinicians were trained to provide the treatment to 14 women. Therapy was administered concurrent with routine prenatal care at inner-city maternal health clinics in New Haven and Bridgeport, Connecticut, small urban cities in the USA. Substance use was monitored by self report, and urine and breath tests. Treatment fidelity was assessed using the Yale Adherence and Competence System. Behavioral treatment delivery in this setting is feasible and is being evaluated in a randomized, controlled, clinical trial.

Keywords

Motivational interviewing; Cognitive behavioral therapy; Pregnant women; Substance abuse; Drug abuse; Alcohol abuse

Introduction

National surveys in the United States show that hazardous substance use during pregnancy remains a significant public health problem. Despite awareness and educational campaigns to reduce the rates of alcohol and drug use in pregnancy, 4% of pregnant women between

the ages of 18 and 44 used illicit drugs during pregnancy and 11.8% used alcohol. (SAMHSA 2007) Among women in the latter group, 2.9% binge drank and 0.7% drank heavily during the first trimester of pregnancy. This resulted in utero exposure to drugs and/or alcohol for one million offspring each year.

Women with addictions who receive adequate levels of prenatal care have better birth outcomes than women who receive less prenatal care. (El-Mohandes et al. 2003) The obverse, receipt of substance abuse treatment with prenatal care, also appears to improve neonatal outcomes. Women who received prenatal care that was either enhanced or linked with substance abuse treatment, delivered larger, healthier and more mature babies than did mothers who received only routine prenatal care. (Armstrong et al. 2003; Newschaffer et al. 1998; Sweeney et al. 2000) However, because women participating in these studies were not randomized and in some instances, the control group included women who refused enhanced care, studies need to be interpreted cautiously.

To test the specific effects of substance abuse treatment for pregnant women, a handful of randomized, controlled trials have used either brief (Grace Chang et al. 1999; Handmaker et al. 1999; O'Connor and Whaley 2007) or inpatient treatment with follow up intensive outpatient treatment (Jones et al. 2001; Jones et al. 2000; Silverman et al. 2001; Svikis et al. 1997). Results for brief interventions were mixed with some showing equivalent reductions between experimental and control groups (G Chang et al. 2005; Grace Chang et al. 1999; Handmaker et al. 1999) while others found that brief advice led to greater reductions in use compared to usual care. (O'Connor and Whaley 2007) High spontaneous remission rates for alcohol and drug use in pregnancy, and the inclusion of women with less severe alcohol problems may be responsible for the overall lack of differences between active treatment and control conditions. In line with this, women with heavier alcohol use appear more likely to benefit from a brief intervention than no intervention. (G Chang et al. 2005; Handmaker et al. 1999)

Comprehensive trials that employed contingency management and therapeutic work settings led to decreased hazardous substance use during pregnancy and the postpartum period relative to control conditions. (Jones et al. 2001; Jones et al. 2000; Silverman et al. 2001; Svikis et al. 1997) However, contingency management was only effective at "higher dose" rewards and efficacy was limited to the period that contingencies were available unless women were abstinent prior to receiving care. (Jones et al. 2001) Importantly, these interventions required substantial resources and referral to specialty treatment settings that may best be reserved for treatment refractory patients.

Routine referral of substance abusing individuals to offsite specialty treatment is often unsuccessful. In a nationally representative survey of primary care patients, only 4.4% (95% CI 1.8, 7.0) of individuals who screened positive for a solo substance abuse diagnosis and 25.2% (95% CI 16.5, 33.9) of patients who screened positive for dual diagnoses (substance abuse and another psychiatric disorder) followed-up with a specialty treatment referral. (Edlund et al. 2004) On the other hand, 38% (95% CI 29.1, 47.0) of patients who screened positive for substance abuse and 77.8% (95% CI 69.3, 86.3) of those who screened positive for a dual diagnosis participated in treatment on-site. This suggests that treatments deployed in prenatal clinics and obstetrical providers' offices, could greatly enhance treatment adherence.

When considering potential treatments that could be administered in a prenatal clinic for pregnant substance abusers, behavioral therapies have particular appeal. First, behavioral treatments do not entail medication use and thus will not complicate the possible embryotoxic effects of other substances that have been used during pregnancy. Second, because

pregnant women are typically seen repeatedly for prenatal care, behavioral treatments can be delivered over a number of prenatal visits. Third, behavioral interventions could target a range of addictive substances and psychosocial problems that women may have thereby enhancing “real world” and long term applicability. Fourth, behavioral treatments can be tailored to a brief format that would be efficient for a primary care setting such as a prenatal clinic. Last, we propose that medical healthcare providers can be trained to integrate such skills counseling within the purview of their obstetrical clinic. Below we describe the authors’ adaptation of motivational interviewing (MI) and cognitive-behavioral coping skills treatment (CBT) (Carroll 1998; Kadden et al. 1992; Monti et al. 2002) into a 6 session outpatient treatment designed to be delivered in an obstetrical setting by non-behavioral health practitioners. We also present brief case studies from our pilot trial testing the feasibility of this intervention.

Materials and methods

Subjects

Women were eligible for initial testing and refinement of this intervention if they were at least 17 years of age, spoke English as their primary language, and were planning on delivering at either Yale-New Haven Hospital in New Haven, Connecticut or Bridgeport Hospital in Bridgeport, Connecticut. Subjects must have self-reported alcohol or illicit drug use within the 28 days prior to being screened for the study, which occurred in conjunction with a standard obstetrical healthcare appointment. We used a definition of “active use” because pregnant women who use drugs or alcohol often adopt healthy habits and many spontaneously stop using substances when they learn they are pregnant (Ebrahim and Gfroerer 2003; Ebrahim et al. 1998) However, we accepted women with minimal quantities of use, knowing that there is no safe amount of alcohol or drugs during the prenatal period. Women were ineligible if they were planning to move, were using an opiate or nicotine as their only substance, were already engaged in psychological treatment for substance abuse (other than self help groups) or were clinically unstable (including if their suicide risk was high) and required inpatient treatment. The decision to exclude women who were exclusively using opiates was made since the medically-indicated treatment for opioid dependence during pregnancy is methadone and women receiving methadone during pregnancy are often enrolled in comprehensive treatment programs.

Subjects were recruited from two local prenatal clinics that are affiliated with the Yale University School of Medicine. Pregnant women receiving care at the participating clinics were approached by study staff and administered the brief questionnaire; those acknowledging recent use were offered participation in the treatment phase of the study. Research assistants screened women for hazardous substance use during usual prenatal care. Women were invited to return to clinic at their next prenatal visit, or sooner if desired, to begin treatment sessions. The first 14 women eligible and consented for this study were considered pilots for the purpose of reality- and practicality-testing the protocol. A fifteenth subject was offered services as described, but did not show for any scheduled visits, and thus is not considered in this analysis.

A Certificate of Confidentiality was obtained for the purposes of screening and treating this group of at-risk patients. Women were assured that their information would be protected, as much as legally possible, by study and hospital staff. After providing consent as approved by the Yale University School of Medicine Human Investigations Committee, potential subjects completed a comprehensive, computerized intake assessment which included the TWEAK (Russell 1996), the Addictions Severity Index (McLellan et al. 1980), the Inventory of Depressive Symptomatology (Rush et al. 1996) and the MINI neuropsychiatric

interview (Sheehan et al. 1996). A first treatment appointment was arranged with a study (non-behavioral health) clinician as promptly as feasible.

Subjects were seen by their study clinician for about 30 min during their usual prenatal visits. Research assistants called subjects prior to every scheduled visit to remind them of their appointment. Sessions were audio taped and clinical case supervision by mental health professionals was provided to the non-behavioral health clinical trainees. Fidelity of the treatment was determined using the Yale Adherence and Competence System that included components of brief advice, MI and CBT. (K. M. Carroll et al. 2000) For this pilot, we rated 21 items that included three brief advice items, six MI items, eleven CBT items (including one that is shared with MI) and 2 general therapy items.

Treatment

The typical schedule of prenatal care includes once-monthly appointments through the first two trimesters (28 weeks), biweekly appointments in the seventh and 8 months (28–36 weeks), and then weekly visits until delivery (~40 weeks). Hazardous substance users often enter prenatal care late and early labor and delivery is not unusual. Given this, we developed six topic sessions that we envisioned could be reasonably delivered alongside prenatal and postnatal care. MI (Miller & Rolnick 1991) and CBT for substance misuse (K. Carroll et al. 2004; Kadden et al. 1992; Monti et al. 2002; Parsons et al. 2005) were simplified and combined into one-on-one, 30-minute “skills training sessions” that primary healthcare personnel could be trained to deliver to their pregnant patients. Treatment was offered for the duration of pregnancy and no limit was imposed upon the quantity of sessions if it was considered helpful for a subject to receive more exposure to a particular topic. The stated study goal was, at minimum, to offer each subject all six sessions worth of content.

One key skill was taught during each 30-minute session. Sessions followed a 10-10-10 rule that included 10 min for review of homework or activities from the prior session, 10 min for the main skill training of the session, and 10 min to assign homework and introduce the topic for the next session. Although there is a suggested sequence to the topics, therapists are taught that they may modify the order of sessions or repeat them, as clinically warranted.

Session one employs MI to engage the patient in the program and to promote decreased substance use. It begins with a brief review of the subject’s substance use history followed by an exploration of the way in which alcohol and/or drugs affect her life. Utilizing a motivational interview, the therapist elicits from the subject reasons that she may want to reduce her hazardous substance use. In anticipation of the next session and to prepare the subject for homework, the concept of “triggers” is introduced, and she is asked to generate a list of non-alcohol/non-drug activities in session and then to engage in these activities daily as homework.

Session two entails standard functional analysis to identify the antecedents, behaviors and consequences related to use of hazardous substances. Information regarding “triggers” is further considered from the prior session and through in vivo homework, as well as through an exploration of the participant’s life patterns. This knowledge enables investigation of unique patterns of use (who, where, when and why). Techniques for interrupting substance use patterns with a replacement non-drug activity are discussed, and the patient is asked to practice interrupting her patterns with specified behaviors daily or as often as possible between sessions.

Session three addresses sexually transmitted infections (STIs), including Human Immunodeficiency Virus, as health risks relative to substance use. The therapist obtains a brief sexual history, discusses the connection between substance use and sexual activity, and

provides education about STIs. The therapist could use functional analysis with reference to sexual behavior or other techniques such as role playing to address risky sexual behavior. Homework involves a log of sexual activity/behavior, functional analysis of risky sexual behavior, or continuation of prior assignments, depending on the subject's needs and/or risks.

The focus of the **session four** is communication skills. The therapist reviews communication patterns with the pregnant woman and they jointly determine the areas to work on (either distinct interpersonal relationships or specific topic areas), with particular emphasis on effectively communicating drug refusal. Participants typically work to replace patterns of aggression and/or passivity with more assertive communication. Role playing is encouraged so that the subject could practice her skills and explore possible challenges. Homework includes worksheets that allow the subject to assess situations in which she may encounter communication problems that generate vulnerability to relapse and/or sexual risk.

Session five specifically addresses relapse-prevention techniques. The therapist works with the subject to understand relapse scenarios and develop a plan for potential risky situations. If warranted, functional analysis, role playing or other skills are employed. Subjects who have not fully stopped substance use can benefit from this session in a modified fashion, by applying the same techniques to further reduce, or ultimately cease alcohol/drug use. Homework assignments help the subject identify risky situations as well as supportive individuals she could turn to or places she could go to avoid using hazardous substances. In keeping with the here-and-now, clinical reality approach of this manualized intervention, relapse is viewed as a realistic possibility in the process of recovery, and the discussion is kept frank and direct rather than punitive or critical.

Session six offers an opportunity for more open-ended life assessment. The therapist helps the subject to identify problem areas in her life and discusses problem-solving techniques that would help her cope with problems rather than returning to the use of alcohol or drugs. Central to this session is a guided process of personal goal-setting for future personal growth, often in areas of education, employment, housing, family wellness and personal recovery.

Clinicians Administering the Treatment

A unique feature of this treatment was the intention that it be administered not by behavioral health care clinicians but rather by healthcare providers who typically practice in an obstetrical setting. In this pilot work, four nurses and one medical student were successfully trained to administer the combined MI-CBT treatment using training methods and fidelity ratings described by Carroll et al (K. M. Carroll et al. 1994). These individuals were members of the team who were engaged to participate in the subsequent randomized clinical trial of this treatment as compared to brief advice. The training consisted of at least four didactic sessions and review of the treatment manual. Trainees listened to at least four sets of training tapes whereby a senior therapist administered six sessions of treatment to a patient who was a pregnant substance user. Trainees were supervised on a session-by-session basis.

Results

Fourteen subjects provided consent and voluntarily participated in this pilot. Subjects were racially reflective of the overall clinic population: 36% African American, 50% Caucasian and 14% subjects identified themselves as mixed race. Ethnically, 21% were Latina and 79% were not. Participants averaged 27.4 (sd=6.0) years of age, had 1.6 (sd=1.7) other

children and had 12.3 years (sd=1.7) of education (high school degree or testing equivalency). (see Table 1)

Women were an average of 20.1 (sd=10.1) weeks pregnant at screening and 22.5 (sd=8.2) weeks pregnant at commencement of treatment. Subjects participated in the program for an average of 16.3 weeks (sd=7.1) and received 3.9 (sd=2.5, range 1–6) sessions. For the purposes of piloting the intervention, more than six sessions were not offered to this initial cohort. However, the intention is that, upon implementing the intervention into the standard clinic care, no limit will be imposed upon quantity of sessions, paralleling the notion that obstetricians impose no limit upon number of prenatal care visits. In addition, visits will be extended to include the routine postpartum checkups, in the hope of conferring additional benefit to women and their newborns. Additionally in this vein, patients and providers can repeat session content based upon individual need or problem areas.

Based upon self-reported drug use patterns from the 6 months prior and then during pregnancy, the most frequently used drugs were alcohol, cocaine and marijuana; notably, 79% of our pilot participants also smoked cigarettes. At baseline, women had an average of 3.78 (sd=5.83) drug or alcohol using days in the preceding 28-day period. The modest number of days may reflect the fact that many subjects reported decreased drug usage because of pregnancy. At the end of treatment, substance use, as measured by self-report, was reduced further to 1.63 (sd=4.68) drug using days during the preceding 28-day period. Breath and urine tests were consistent with subject report. In addition, at the end of treatment, IDS scores were reduced from 23.9 (sd= 12.9) to 17.1 (sd=13.7) (Table 2).

A random sample of sessions was rated for fidelity to assess whether the therapists were using MI and CBT rather than brief advice elements, which would be the control condition in future work. Frequency of elements differed among the three treatments with elements of brief advice being used the least, MI next in frequency, and CBT the most ($F=5.0334$, $df=2$, $p=0.02$). This is consistent with the way in which the treatment was designed in that brief advice would be relatively absent, elements of MI would be used the most during the initial session and when needed during subsequent sessions and CBT techniques would be used the majority of time.

Two case examples follow as clinical representation of participants in this pilot study.

Case #1

Michelle is a Caucasian female in her early 30's. She entered the program in the fifth month of her 3rd pregnancy, while living with her boyfriend and mother. Her other 2 children were not in her custody during her time in our care. She reported long-standing abuse of alcohol and binges of cocaine use with her longest recent periods of sobriety being 4–6 weeks. She experienced a number of psychosocial issues including a history of criminal arrest, hospitalizations, loss of job, involvement of child protective services, and unstable relationships. She also reported a history of physical and sexual trauma. She identified pregnancy as a primary reason for wanting to reduce use, in an attempt to offer a healthy start for the baby. She struggled to prioritize her own self-worth as a reason for her health and recovery.

Given her history of chronic use, treatment goals of reduction of use were considered great accomplishments, on the path toward the ultimate goal of abstinence. She fluctuated in her ambivalence about behavioral change, recognizing the powerful role which alcohol and drugs had played for the majority of her adult life. Drugs linked her to entertainment and pleasure, and ultimately buffered her from having to face her own disappointment at not meeting life dreams. She worked as a bartender, socialized with peers who drank and used

cocaine and felt comfortable in her family of origin where drugs were part of the constellation of the social network.

Michelle attended six 30-minute sessions of manualized behavioral skills counseling over the course of 12 weeks in conjunction with her prenatal care. She carried her pregnancy to full term. Toward the end of her pregnancy, she began attending a 12-step support group in the community, and made an intake appointment to be evaluated for an intensive community-based mother-baby treatment facility. She left her job, identifying it as too risky a trigger for her own recovery. She re-evaluated her relationship with family members who drank at home, and role-played attempts at communicating with them the ways in which this challenged her own ability to stay clean and sober. She addressed her motivation to reduce use, recognizing her increased risk for temptation and cravings once postpartum. Her alcohol consumption reduced from an average of 20 days per month to 6 days per month, and she used cocaine only three times while receiving skills counseling.

Case #2

Tanya is an African-American woman in her mid-20's who reported sporadic use of marijuana since high school. She reported a strained relationship with her family of origin, with the exception of one sister, who lived next door and with whom she was quite connected. She denied a history of trauma, and exhibited mild symptoms of depression, mostly in response to situational stressors. She was pregnant with her first child and in a committed relationship with her boyfriend whose own 2 children resided in their home. She attended college classes, was employed as an office secretary and had a supportive network of friends her own age, most of whom also smoked marijuana regularly.

Tanya had never sought substance abuse treatment, although she had a positive experience with counseling when, as a child, her parents divorced. She denied that her marijuana use interfered with her work or schooling, although she acknowledged that she might be able to take more courses if she had not been smoking. She reported challenges with her boyfriend and home environment and found marijuana helped her to relax and generally relieved stress. However, she indicated a desire to quit during the pregnancy, and for that reason enrolled in the program for assistance and guidance.

Tanya attended six 30-minute sessions of behavioral skills counseling. She generated her own motivation to stop smoking marijuana and focused on communication skills with immediate and distant family about partnership and parenting expectations and responsibility-sharing. She also made excellent use of goal-setting regarding her career and education, plans for saving money to move to a larger, more comfortable home, and the development of stress-management skills. With coping skills in place, her new goal was to remain abstinent from smoking after the delivery of her baby, anticipating that her work and school performance would improve without use, and she would be better able to manage her newborn.

Discussion

We adapted an MI-CBT behavioral intervention for use in a prenatal clinic to encourage a decrease in hazardous substance use by pregnant patients. The use of a prenatal care setting to provide substance use treatment streamlines health care and decreases the risk of attrition that can occur with off-site referrals. Our pilot demonstrates the feasibility of MI-CBT services integrated with usual prenatal care; the brevity of the intervention in all likelihood enhanced its practicality. The ability of non-behavioral health care workers to provide our treatment holds promise for approaches that provide collaborative substance use and prenatal care. This extends the work of others who have used MI and CBT for treatment of

substance use problems in settings that are not traditional behavioral health care clinics (D'Onofrio et al. 2005; Fleming et al. 2008; Morgenstern et al. 2001).

Our pilot also illustrates the potential for a behavioral treatment to promote a reduction in hazardous substance use in pregnant women. On average, the days of drug use during the preceding month decreased by nearly half at endpoint. This occurred despite the fact that pilot subjects on average only received 4 sessions of our intended 6-session protocol. However, interpreting results from this pilot are limited by the small number of women, the generally low degree of substance use in our sample and the lack of a comparison condition.

Women who are pregnant often adopt healthy behaviors “for the baby.” Our intervention attempts to build upon the potential for naturally-occurring motivation to control or discontinue hazardous substance use during this time but it remains to be seen whether our behavioral treatment will add to women’s motivation and ability to decrease or stop hazardous substance use, especially during the postpartum period. A randomized clinical trial is underway to measure the incremental benefit of this treatment. Such a trial will provide a more detailed assessment of the feasibility and efficacy for a program that integrates substance abuse treatment into an obstetrical clinic. Should it prove efficacious, it may be extended to other settings such as pediatric centers.

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Glossary

MI	Motivational Interviewing
CBT	Cognitive Behavioral therapy
STI	Sexually Transmitted Infections

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Table 1

Patient characteristics at baseline

	Total N=14 Value (sd)
Age	27.4 (6.0)
Parity	1.6 (1.7)
Education (years)	12.3 (1.7)
Race:	N (%)
African American	5 (36%)
Caucasian/White	7 (50%)
Mixed race	2 (14%)
Ethnicity:	
Hispanic/Latina	3 (21%)
Not Hispanic/Latina	11 (79%)
Gestational age:	
At Screening	20.1 (10.1)
At Intake Assessment	22.5 (8.2)
Mood Disorder ^a :	
Major Depression	2
Dysthymic Disorder	1
Suicide risk	5
Generalized Anxiety Disorder ^a	3

^a Mood and Anxiety disorders measured by Self-report, computer-administered MINI

Table 2

Treatment measures

	Intake	Endpoint
IDS-SR ^a	23.9 (12.9)	17.1 (13.7)
ASI-Alcohol, μ (sd)	0.16 (0.22)	0.06 (0.19)
ASI-Drug, μ (sd)	0.05 (0.06)	0.03 (0.07)
Average number of days of use in prior 28 days ^b		
Alcohol	2.42 (5.7)	1.64 (4.7)
Marijuana	1.57 (3.3)	0
Cocaine	0.64 (1.6)	0

^aIDS-SR = Inventory of Depressive Symptomatology-Self Report,

^bAccording to the self-report, Substance Use Calendar