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A randomized clinical trial of counseling and nicotine replacement therapy for treatment of African American non-daily smokers: Design, accrual, and baseline characteristics

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ABSTRACT

Background: Non-daily smokers (NDS) who smoke on some but not all days are a growing subset of United States (US) tobacco users. Racial/ethnic minorities are more likely to be NDS. African American NDS have strikingly high levels of nicotine and carcinogen exposure, making treatment of this high risk group a priority.

Methods: The current study is one of three ongoing federally-funded clinical trials of NDS and, to our knowledge the only RCT focused on racial/ethnic minority NDS. The design has been guided by input from Patient and Stakeholder Advisory Panels who helped develop the research questions, design the intervention, and select the outcomes. The objective is to compare the effectiveness of smoking cessation counseling alone (C) or smoking cessation counseling plus participant's choice of nicotine replacement therapy (NRT; C + NRT) for African American NDS. Two-hundred seventy-eight African American NDS will be randomized in a 2:1 fashion to C + NRT or C. All participants receive five sessions of smoking cessation counseling; those randomized to C + NRT receive their choice of nicotine gum, patch, and/or lozenge. Treatment in both groups lasts for 12 weeks. We hypothesize that C + NRT will be more effective than C on the primary outcome of biochemically-confirmed abstinence from smoking at week 12. Secondary aims will compare C + NRT and C on patient- and provider-desired outcomes including abstinence from smoking at week 26, change in biochemically-verified nicotine and carcinogen exposure, days abstinent, and treatment process measures (e.g., NRT use and side effects). Predictors of abstinence will also be explored.

Discussion: Findings will illuminate effective treatment options for African American NDS and contribute to development of evidence-based guidelines for treating the 8.9 million US adult NDS for whom no guidelines currently exist.

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1. Introduction

Non-daily smokers (NDS) report smoking on some but not all days and constitute 8.9 million adults or 24.3% of all adult smokers in the US [1]. Prevalence of NDS has increased almost 30% in the last decade. NDS are at risk for the same health consequences of smoking as daily smokers (DS) [2,3], are nicotine dependent [4], and want to quit smoking [5], yet they are overlooked by health care providers and largely have been excluded from clinical trials. As a result, there is an almost complete paucity of information on effective treatments for this growing subgroup of smokers whose smoking patterns challenge traditional nicotine dependence treatment paradigms [5,6]. NDS average 15–20 smoking days per month and routinely abstain for periods of 5–10 days without experiencing significant withdrawal or craving [7,8], contributing to perceptions that NDS do not identify as smokers, are uninterested in quitting, are not addicted enough to warrant the use of smoking cessation medications, and concern that, if nicotine replacement therapy (NRT) is used, the amount of nicotine delivered

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could exceed the levels achieved through smoking [4,6,8]. These perceptions are not supported by the literature [6,9,10]; nonetheless, NDS are less likely than DS to be asked about their smoking status or advised to quit by a physician, have low utilization of smoking cessation pharmacotherapy or behavioral counseling, and experience difficulty in quitting; 73–82% of NDS who attempt to quit resume smoking within 90 days [5].

Racial/ethnic minorities are more likely to be NDS compared to non-Hispanic Whites (Whites) yet they bear a disproportionate burden of smoking-related diseases [11–13]. African Americans, in particular, have higher cardiovascular and cancer-disease risk at lower levels of smoking, including non-daily smoking [14,15]. Concentrations of NNAL, a metabolite of the potent lung carcinogen NNK, and cotinine, the primary metabolite of nicotine, are three to six times higher in African American NDS compared to White and Hispanic/Latino NDS [16,17]. This difference persists after adjustment for racial/ethnic variations in smoking level and nicotine metabolism, suggesting that African American NDS incur substantial risk from their intermittent pattern of smoking. African American NDS are also more likely than White and Hispanic/Latino NDS to have made a quit attempt in the past year and to intend to quit in the next 30 days [7], making the treatment of this high risk group a priority.

To date, only two small pilot studies have examined treatment of NDS [18,19]. The current study is one of three ongoing federally-funded (NIH, PCORI) smoking cessation randomized clinical trials (RCT) examining effective treatments for NDS and the only RCT focused exclusively on racial/ethnic minority NDS. The 3-year study is comparing the effectiveness of smoking cessation counseling alone or smoking cessation counseling in combination with participant's choice of NRT (i.e., nicotine patch, gum, lozenge) on abstinence in African American NDS interested in quitting. The primary aim is to test the hypothesis that 1) African American NDS randomized to C + NRT will have significantly higher biochemically verified smoking abstinence at 12 weeks (end of treatment) than African American NDS randomized to C. Secondary aims are: (2) test the hypothesis that African American NDS randomized to C + NRT will have significantly higher biochemically verified smoking abstinence at 26 weeks (end of follow-up) than African American NDS randomized to C, (3) test the hypothesis that AA NDS randomized to C + NRT will demonstrate significantly greater reductions in nicotine intake and carcinogen exposure and significantly more days abstinent, while experiencing no differences in side effects as participants randomized to C, and (4) identify predictors of successful quitting among African American NDS. Due to the exploratory nature of this aim, no specific hypotheses are proposed for this aim. This paper describes the study design, enrollment, and baseline characteristics of participants in the trial.

2. Methods

2.1. Study design

The study is an unblinded and open-label RCT of 278 African American NDS randomized to receive either 5 sessions of smoking cessation counseling in combination with 12 weeks of their choice of nicotine patch, gum, or lozenge (C + NRT) or 5 sessions of smoking cessation counseling alone (C). A 2:1 randomization schema was used; for every one patient randomized to C, two were randomized to C + NRT. The schedule of enrollment, intervention, and assessment activities is displayed in Table 1. The primary outcome is biologically-confirmed 30-day point prevalence abstinence (PPA) from smoking at week 12. All study visits will be completed at the University of Kansas Medical Center or Swope Health Central, a Federally Qualified Health Center that serves a predominately African American clientele. Study procedures are approved and monitored by the University of Kansas Medical Center (KUMC) IRB (#00001602).

2.2. Patient and stakeholder engagement and study design rationale

The design of this study has been guided by input from Patient and Stakeholder Advisory Panels comprised of nine African American NDS, two physicians serving a predominately African American patient population, and two experts from Optum (formerly Alere), one of the nation's largest provider of cessation quit line services (http://map.naquitline.org/reports/administration/). The panels helped develop the research questions, design the intervention, and select the outcomes. For example, participants receive a choice of nicotine patch, gum, or lozenge because these are the medications that were preferred by our Patient and Stakeholder Advisory Panels. A counseling only control group was chosen because the providers on our Stakeholder Advisory Panel felt uncertain about whether pharmacotherapy conferred any benefits beyond those provided by counseling alone. This is consistent with literature suggesting that NDS, who are more likely to smoke because of the behavioral components of nicotine addiction (e.g., stimuli/cues, positive reinforcing effects) rather than to maintain blood nicotine levels, might benefit more from behavioral counseling focused on management of smoking cues/triggers than pharmacological approaches that replace nicotine in order to reduce withdrawal and craving [4,18–20]. While our primary outcome, biochemically-confirmed abstinence from smoking, is the scientific 'gold standard,' our Patient and Stakeholder Advisory Panels noted other important outcomes of interest. The Patient Advisory Panel was particularly interested in harm reduction outcomes, including reductions in nicotine intake and carcinogen exposure and number of days abstinent. The Stakeholder Advisory Panel was interested in these harm reduction outcomes in addition to side effects and use of NRT in the intervention group.

The panels reviewed and approved the counseling protocol, quit smoking guide, NRT dosing criteria, recruitment materials, and surveys prior to initiation of the clinical trial. Ongoing input from the Patient Advisory Panel helps guide recruitment and retention strategies, interpretation of findings, and dissemination plans, particularly for reaching a broader, non-academic audience.

2.3. Recruitment

Recruitment started in May 2015 and ended in May 2017. Final 6-month follow-up will be completed in January 2018. Participants are recruited through clinic- and community-based efforts, including fliers, physician letters, in-clinic recruitment, radio, television, and social media ads, and word-of- mouth referrals from current and former participants.

2.4. Eligibility

Eligible participants are non-Hispanic African American adults (≥ 18 years) who had smoked at least 100 lifetime cigarettes and met criteria for NDS, defined as smoking cigarettes on 4–27 of the last 30 days and smoking at the current non-daily rate for ≥3 months [21]. Individuals are excluded if they are a daily user of non-cigarette tobacco products, have engaged in a pharmacotherapy-assisted quit attempt in the last 30 days, or are uninterested in quitting smoking, taking NRT, refraining from the use of electronic cigarettes or smoking cessation pharmacotherapy, and completing study-related requirements. Individuals with medical contraindications to NRT, including being pregnant or breastfeeding and having a cardiovascular event (i.e., heart attack, angina, arrhythmia, chest pain) in the past 30 days are also excluded; women must be willing to use birth control to avoid pregnancy while taking NRT. Use of non-cigarette tobacco products (e.g., cigarillos, little cigars) are common among NDS, [8,22,23]; users of these products are included in the study as long as they are not daily users (i.e., ≥ 28 days in the past 30) of non-cigarette tobacco products.