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## International Journal of Gynecology and Obstetrics

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



## CLINICAL ARTICLE

## Tobacco use during pregnancy in rural Jharkhand, India



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## ARTICLE INFO

## Article history:

Received 27 November 2014

Received in revised form 30 April 2015

Accepted 27 July 2015

## Keywords:

India

Jharkhand

Pregnant women

Pregnancy

Secondhand smoke

Smokeless tobacco

Tobacco use

## ABSTRACT

**Objective:** To examine the prevalence and correlates of tobacco use during pregnancy in a rural area of India. **Methods:** In the present cross-sectional study, 400 women who gave birth between June 20, 2011, and June 19, 2012, were enrolled in the district of Pakur in Jharkhand, using multistage cluster sampling. Information on tobacco use, awareness of associated adverse health effects, and exposure to secondhand smoke was collected by interview. Multiple logistic regression analysis was used to find correlates of tobacco use. **Results:** Overall, 59 (14.8%, 95% confidence interval [CI] 11.0%–18.7%) women reported tobacco use during pregnancy. Awareness of the adverse health effects of tobacco during pregnancy was poor for 213 (53.3%) women. Tobacco use during pregnancy was significantly associated with an age of 25 years or older (odds ratio [OR] 8.20, 95% CI 2.48–27.15;  $P = 0.001$ ) and poor awareness of adverse health effects (OR 4.48, 95% CI 2.03–9.90;  $P < 0.001$ ). **Conclusion:** There is an urgent need to prevent tobacco use among pregnant women in India and to offer tobacco cessation services during prenatal checkups to those who continue tobacco use during pregnancy.

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## 1. Introduction

Globally, tobacco use is declining among men, but increasing among women, especially in low-income countries [1,2]. The number of tobacco-related deaths among women aged 20 years and older is likely to increase from 1.5 million in 2004 to 2.5 million by 2030, and almost 75% of these projected deaths will be occurring in low- and middle-income countries [3]. Female tobacco users not only share the same health risks as men, but also face many other health consequences, such as menstrual problems, pregnancy complications, and cervical cancer [4]. Pregnant women are a particularly vulnerable group because tobacco use and exposure to secondhand smoke during pregnancy carry serious risks to the fetus [5].

The harmful effects of tobacco use and the benefits of quitting have mostly been reported in reports from high-income countries. In one report [6], infants of women who stopped smoking by the first trimester of pregnancy had weight and body measurements similar to infants born to nonsmoking women. In another [7], the use of Swedish snuff was shown to increase the risk of preterm birth. As for low-income countries, one study from Cambodia [8] identified a strong association between the rate of infant death and maternal use of smokeless tobacco. In India, the consumption of smokeless tobacco during pregnancy

decreased the gestational age at birth and the birth weight [5]. Women who did not use tobacco during pregnancy but lived with smokers had a two times higher risk of stillbirth, indicating that secondhand smoke has an effect on the risk of stillbirth [9].

The Indian National Family Health Survey (NFHS-3) of 2005–2006 [10] showed that 57% of men and 10.9% of women aged 15–49 years used tobacco. In that survey, 10% of all pregnant and breastfeeding women used some form of tobacco. In a later study [11], the frequency of tobacco use during pregnancy was reported to be 33.5% in the state of Odisha and 4.9% in Karnataka. In Jharkhand in 2009–2010, tobacco use was more common than the national average among both men (63.6% vs 47.9%) and women (35.9% vs 20.3%) [12]. Moreover, 56% of adults in Jharkhand were exposed to secondhand smoke at home, a proportion that was higher than that in India as a whole (52%) [12]. Jharkhand reported a 13% prevalence of tobacco use among pregnant women [13]. Smokeless tobacco is the predominant form of tobacco use among Indian women [10].

Even though tobacco use during pregnancy and its predictors have been explored in high-income countries such as Canada [14], data on the pattern of tobacco use and its correlates during pregnancy are limited in India. The present study aimed to explore the prevalence of and factors associated with tobacco use during pregnancy among rural women in Jharkhand.

## 2. Materials and methods

A cross-sectional cluster sample study was undertaken of postnatal women aged 18 years or older who had given birth (live birth, stillbirth,

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or infant death) between June 20, 2011, and June 19, 2012, and had been living in a rural area in the district of Pakur for the 6 months before the present study. The study was approved by the Institutional Ethics Committee of Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum. Written informed consent was obtained from all participants.

On the basis of an estimated prevalence of any form of tobacco use among pregnant women of 13% [12], the minimum sample size required to achieve a confidence level of 95% and a power of 80% was estimated at 175. Because of the use of cluster sampling, a design effect of two and a nonresponse rate of 15% were assumed and the final sample size was set at 400.

The study participants were selected using a multistage cluster sampling method. Among the 24 administrative districts in Jharkhand, the district of Pakur (Fig. 1) was randomly selected for the study using a lottery method. The six administrative blocks of the district were divided into two groups on the basis of the proportion of the population that was tribal (<60% vs ≥60%) [15]. One block was then randomly selected from each of the two groups using a lottery method. Forty villages (clusters) from these two blocks were selected using the “probability proportional to size” method. In each cluster, 10 eligible participants were interviewed. The location of the center of the cluster was identified and one of the streets starting from the center was randomly selected [16]. The first household was randomly selected and the remaining households were continuously surveyed until 10 participants were identified. The same process was repeated for all 40 clusters. Households were visited up to two times if the eligible participant was found to be absent at the first visit. If more than one woman was eligible per household, the study participant was selected by a lottery method.

One of the authors (S.S.) interviewed all study participants in their homes during the year after delivery using a pretested, structured interview schedule; the interviews were conducted in the local language. The collected data included basic sociodemographic information and information on the pattern of tobacco use, exposure to secondhand smoke, and the level of awareness of the adverse effects of tobacco use. When assessing the level of awareness, a score of 1 was given for each adverse effect of which the woman was aware; otherwise a score of zero was assigned. The women were divided into a poor-awareness group and a good-awareness group on the basis of whether their total awareness score was higher or lower than the median of 10.

Women who had used any tobacco product at least once during their lifetime were classified as “ever tobacco users.” “Current users” were those who had used tobacco at least once during the past 30 days.

Tobacco use during pregnancy was assessed by the question “did you use tobacco in the last pregnancy?” Exposure to secondhand smoke was captured by the question “were you ever exposed to passive smoking during your last pregnancy?”

Statistical analyses were performed using SPSS version 17 (SPSS Inc, Chicago, IL, USA). Multiple logistic regression analysis using the generalized estimation method was performed to find the correlates of tobacco use during pregnancy.  $P < 0.05$  was considered significant.

### 3. Results

In total, 2303 households were visited, 417 eligible women were identified, and 400 (95.9%) women agreed to participate. The mean age of the participants was  $26.4 \pm 5.4$  years (range 18–40). Among the 398 participants who were or had been married, the mean age at marriage was  $17.6 \pm 1.6$  years; 181 (45.3%) participants were married before the legal age at marriage of 18 years. The mean monthly expenditure per person was  $595 \pm 342$  Indian rupees (approximately US\$9.4). On average, the women had two children at the time of the survey and a household size of five. The basic characteristics of the study sample are presented in Table 1.

Awareness of the general health effects of tobacco use was highest for cancer (313 [78.3%] women), followed by tuberculosis (254 [63.5%]), respiratory disease (187 [46.8%]), heart disease (131 [32.8%]), hypertension (97 [24.3%]), diabetes (85 [21.3%]), and reproductive problems (83 [20.8%]). Delivery of the previous pregnancy took place in a hospital for 265 (66.3%) women; the remaining women delivered at home. More than half (228 [57.0%]) of the women were living with at least one smoker in the household. When asked about the types of smoking tobacco that can be injurious to health, 373 (93.3%) women mentioned bidis, 326 (81.5%) mentioned cigarettes, and 174 (43.5%) mentioned hookahs. Regarding smokeless tobacco products, 333 (83.3%) women were aware of the effects of gutka; the corresponding figures were 276 (69.0%) for khaini, 243 (60.8%) for chuttas, 208 (52.0%) for gul, 196 (49.0%) for chilam, 158 (39.5%) for snuff, and 152 (38.0%) for betel quid. Regarding pregnancy-related problems caused by tobacco use, the highest awareness was reported for the risk of spontaneous abortion, followed by preterm delivery, low birth weight, and stillbirth (Table 2). Awareness of adverse pregnancy outcomes resulting from exposure to secondhand smoke was highest for spontaneous abortion (reported by 80 [20.0%] women), followed by preterm delivery (56 [14.0%]), stillbirth (44 [11.0%]), and low birth weight (43 [10.8%]). Twenty-six (6.5%) women were not aware of any of the adverse effects of tobacco on health generally or on pregnancy outcomes. On the basis

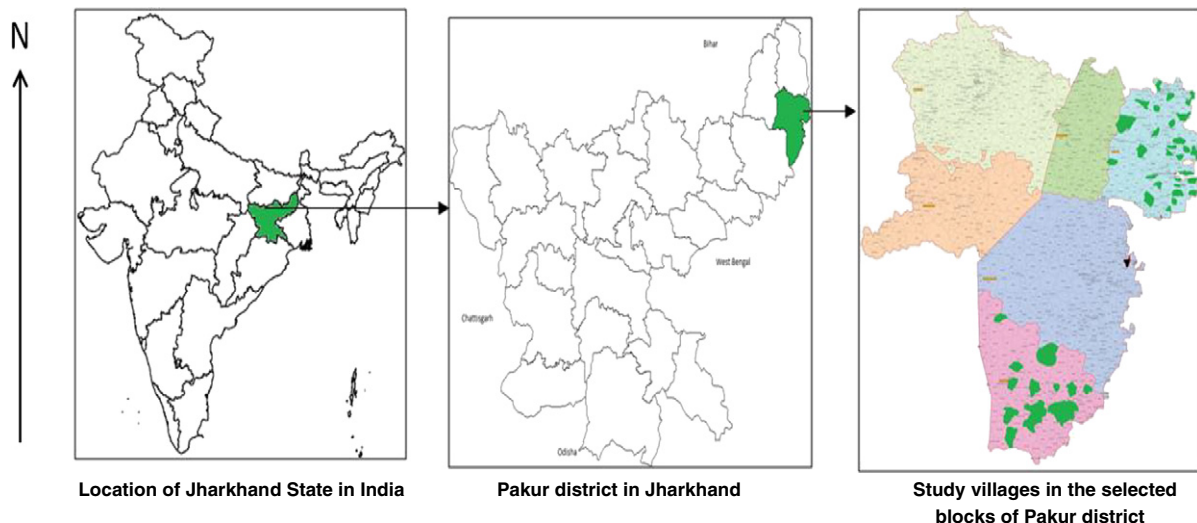


Fig. 1. Study location. Maps not to scale.

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