

Short reports

Smoking and intrauterine growth retardation in Republic of Benin

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Use of tobacco by women in Africa is infrequent and mainly confined to cities. It involves cigarette smoking and chewing of tobacco. In Benin, a woman who smokes is considered to be of loose morals. Such social barriers to smoking are more prevalent in rural settings than in cities, but the extent of smoking is not well known.¹ In the city of Cotonou, smoking is becoming increasingly popular and the prevalence of intrauterine growth retardation (IUGR) remains high. The aim of this study aim is to determine the effect of smoking on IUGR.

Methods

The study was carried out in Cotonou, with a population of about 500 000, where 95% of all births take place in public maternity units. The data were collected from 1991 to 1992 on 4113 women randomly recruited in prenatal care and followed up until delivery. Smoking during pregnancy and unwanted pregnancy information were obtained by the midwives through interview just after clinical examination. The smoking data were categorised (yes/no). The date of the last menstruation, height of uterus, birth as well as the use of prenatal services, complications of pregnancy (for example, bleeding, malaria), and malnutrition (for example, less than 50 kg before pregnancy) were extracted from the medical record at the maternity.

Infants born at 37 or more weeks gestation and weighing less than 2500 g were IUGR. But normal weight infants were defined as those weighing 2500 g or more at 37 or more weeks gestation.

To compare the characteristics of mothers, the χ^2 test was used, and multiple logistic regression analysis was carried out and 95% maximum likelihood confidence intervals (CI) were calculated. We estimated also the population risk attributable with the adjusted odds ratio.

Results

Of 4113 women enrolled in the study, 10.9% pregnancies (n=448) were compatible with the definition of IUGR and 6.9% (n=284) ended prematurely. Smoking prevalence was 8% in the study sample. Among smokers the IUGR rate was 4.5% (95% CI 3.6, 5.1) and 2.2 % among non-smokers (95% CI 1.8, 2.8). Most

IUGR women were married, aged between 20 and 34 and of low socioeconomic standing. They did not differ from those whose offspring were normal with regard to age, marital status, years of schooling, and income (p=0.10). History of a previous IUGR, complications during pregnancy, malaria, and low maternal body weight (for example, less than 50 kg) were significantly more frequent in the IUGR group than the second group (p = 0.03). Mothers of IUGR newborns made inadequate use of prenatal services compared with mothers with normal infants (p=0.02). The logistic regression provided an adjusted estimate of the association between smoking and IUGR (OR = 1.81, CI = 1.04, 3.12). Moreover, complications like bleeding, malnutrition, malaria and history of a previous IUGR were significantly associated with low birth weight. Parity, was found inversely associated with IUGR and prenatal care protective against this outcome (table 1). The population risk attributable to smoking estimate is 24 per 1000 live birth.

Comment

These results indicate a positive association between smoking and IUGR after adjustment and despite a relatively small number of smokers. They are in keeping with the published findings of studies carried out in countries where smoking is more prevalent than in Benin.² The exact mechanism by which smoking interferes with intrauterine growth, however, remains largely unknown. One explanation would be that nicotine and carbonmonoxide trigger fetal carboxyhaemoglobin, which, through reduced fluidity of blood,

Table 1 Relation between intrauterine growth retardation, smoking, and others maternal characteristics

| Characteristics | Crude OR (95% CI) | Adjusted OR (95% CI) |
|-----------------|--------------------|----------------------|
| Smoking (y/n) | 1.98 (1.14, 3.42)* | 1.81 (1.04, 3.12)* |
| Age (y) | 0.98 (0.73, 1.30) | 0.92 (0.69, 1.23) |
| Marital status | 1.01 (0.75, 1.35) | 0.91 (0.79, 1.05) |
| Schooling | 0.92 (0.81, 1.07) | 0.92 (0.81, 1.07) |
| Income | 0.93 (0.71, 1.22) | 0.93 (0.71, 1.22) |
| Parity | 0.90 (0.83, 0.98)* | 0.89 (0.83, 0.95)* |
| Previous IUGR | 1.68 (1.21, 2.37)* | 1.71 (1.22, 2.39)* |
| Actual weight | 2.02 (1.61, 2.35)* | 2.01 (1.64, 2.47)* |
| Bleeding | 1.95 (1.49, 2.56)* | 2.04 (1.56, 2.67)* |
| Malaria | 1.06 (1.00, 1.34)* | 1.05 (1.01, 1.32)* |
| Prenatal care | 1.30 (1.14, 1.49)* | 0.60 (0.45, 0.80)* |

*Statistically significant.

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slows the oxygenation of the fetus.³ If this association were a causal one, then the cessation of smoking during pregnancy would lead to a reduction of 24 IUGR per 1000 live births. However, the quality of data that served to define IUGR and the duration of pregnancy may have lead to misclassification and the accuracy of smoking information could be questioned. As data were collected in the same manner for IUGR infants and those with normal birth weight before delivery, odds ratio results could not be affected. But moral aspects related to women smoking may have underestimated smoking prevalence. Furthermore, the study did not consider passive inhalation (for example, husband) or the quantity of tobacco smoked during pregnancy. It has been shown that maternal smoking increases the risk of dependence in female offspring⁴ and the

fight against smoking may have a beneficial effect on future generations. Thus, it would be appropriate in Benin to inform adolescent girls about the dangers of smoking for themselves and for the children they will have. Our results corroborate the results of other studies.⁵ Nowadays, smoking is becoming a new challenge for public health practitioners in Africa.

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