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BRIEF COMMUNICATION

Prevalence of malaria and anemia among pregnant women residing in malaria-endemic forest villages in India

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Synopsis: Malaria and anemia are alarmingly common among pregnant women from ethnic tribes in Andhra Pradesh and Chhattisgarh who have little access to health care.

India has the highest burden of malaria in Southeast Asia, accounting for 61% of confirmed cases in the region in 2011 [1]. Furthermore, more than one-fifth (22.6%) of *Plasmodium falciparum* and 42% of *Plasmodium vivax* infections globally occur in the country [2]. The prevalence of malaria is increased among the ethnic tribal population residing in areas of India affected by long-term conflicts of low intensity [3]. Malaria in pregnancy is the most common yet preventable cause of maternal and perinatal morbidity and mortality. Additionally, anemia is a major public health problem among pregnant women in India; about 80% of maternal deaths in South Asia are related to this condition [4]. The aim of the present study was to assess the prevalence of malaria and anemia among pregnant women from ethnic tribes in Andhra Pradesh and Chhattisgarh.

Data were used that had been previously collected by Médecins Sans Frontières India for 1222 pregnant women residing in adjoining forest villages who attended one of seven mobile prenatal-care clinics between January 1 and December 31, 2012. Rapid diagnostic tests were performed to detect malaria among pregnant women with a history of fever. To detect anemia in the pregnant women, hemoglobin levels were estimated using HemoCue (HemoCue AB, Ängelholm, Sweden). For the present study, only the secondary data pertaining to the total number of pregnant women and whether results were positive or negative were obtained; other information such as type of malaria was not collected. Ethical clearance was not necessary, because data were obtained from a retrospective review of records.

The overall prevalence of malaria was 20.6%, ranging from 13.3% in Tippapuram to 47.6% in Maita (Table 1). The proportion of pregnant women with anemia was 73.2%

(Table 1).

In spite of the National Vector Borne Disease Control Programme and the introduction of artemisinin-based combination therapy, insecticide treated bed nets, and a longlasting insecticidal net, the prevalence of malaria in the study area is alarmingly high. Similarly, although the National Nutritional Anemia Control Programme has been implemented for more than three decades, anemia continues to be a severe public health problem. Access to modern health care is poor in the region, not because of geographic isolation, but as a result of constant conflict-related issues leading to security restrictions for health staff. Therefore, individuals seek healthcare services from traditional healers, untrained individuals, and *dais* (traditional birth attendants).

Sustainable intervention strategies—e.g. health and nutrition education through information, education, and communication activities, and behavior change communication—need to be implemented, with a focus on women of reproductive age. In India, local health workers and the community could be mobilized to prevent and control anemia and malaria among the women of reproductive age from ethnic tribes in general and those who are pregnant in particular.

Conflict of interest

The authors have no conflicts of interest.

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Table 1 Prevalence of anemia and malaria by area.^a

Area	Number of women who attended prenatal-care clinics	Anemia ^b	Number of women with a history of fever	Positive rapid diagnostic test
Maita	41	15 (36.6)	21	10 (47.6)
Mallampeta	198	122 (61.1)	112	18 (16.1)
Dharmannapeta	341	190 (55.7)	171	26 (15.2)
Pusuguppa	134	120 (89.6)	59	10 (16.9)
Tippapuram	161	126 (78.3)	75	10 (13.3)
Yampuram	261	236 (90.4)	144	44 (30.6)
Puttapalli	86	86 (100.0)	53	13 (24.5)
Total	1222	895 (73.2)	635	131 (20.6)

^a Values are given as number (percentage) unless otherwise indicated.^b Hemoglobin <110 g/L.