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Knowledge, Attitudes, and Practices regarding Dengue among 305 Pregnant Women at the Angré University Hospital Center

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Abstract

Objective: To assess the knowledge, attitudes, and practices regarding dengue fever among pregnant women in order to improve care in this population group. **Study Population and Methods**: This was a cross-sectional, descriptive study conducted from January 1, 2025, to September 30, 2025, at the Angré University Hospital Center. The study population consisted of pregnant women who consulted at this center. Those with a gestational age of ≥11 weeks of amenorrhea and a dating ultrasound were included in the study. The questionnaire was administered using Google Forms. There were five possible answers according to the Likert scale, with a threshold of 60% for correct answers. Sociodemographic characteristics, knowledge, attitudes, and practices were the variables considered. **Results**: The study included 305 pregnant women. The mean age was 34.46 years (±4.027). 53.11% of the patients had given birth less than five times, and 51.80% worked in the informal sector. 59.34% resided in the Cocody district. The level of knowledge regarding dengue transmission was 90.16%, and 1.97% were aware of maternal and fetal complications. 84.26% of the pregnant women did not change their household water supply. 63.28% of the pregnant women did not sleep under mosquito nets. **Conclusion**: Pregnant women have good knowledge about dengue fever, but this does not impact their attitudes and practices. Pregnancy, which allows for monthly visits to health centers, should be an opportunity for healthcare professionals to raise awareness in order to bring about a change in behavior.

Keywords

Dengue, Environment, Pregnancy, Knowledge, Attitudes, Practices, Angré

1. Introduction

Dengue is an infectious disease transmitted by mosquitoes of the Aedes genus. It is a public health problem due to its severity, particularly in the case of dengue hemorrhagic fever, but also because of its increasing incidence [1] [2]. This increase in the incidence of dengue is partly due to the rapid and often poorly controlled urbanization of cities [3]. This places it among the so-called "re-emerging" diseases. There are 390 million cases per year worldwide, of which 96 million are symptomatic [4]. In Côte d'Ivoire, in the Cocody-Bingerville health district, the dengue test positivity rate is 11% [5]. Dengue affects all types of population, including pregnant women.

Dengue fever is poorly understood and often mistakenly confused with malaria by both healthcare professionals and the general public. Indeed, it has no specific clinical signs, and its progression is unpredictable. Dengue fever in pregnant women has particular characteristics. These include the risk of teratogenicity [6] as well as the risk of developing a severe hemorrhagic form that can be life-threatening for the mother [7]. Several studies have been conducted among healthcare professionals [8] [9]. However, few studies have been carried out on pregnant women regarding dengue fever.

In this context, what might be the educational needs of pregnant women regarding dengue fever? To this end, we assessed the knowledge, attitudes, and practices of pregnant women regarding dengue fever in order to improve their care, particularly prevention.

2. Study Population and Methods

This was a cross-sectional, descriptive study of knowledge, attitudes, and practices. It took place over a period of 9 months, from January 1, 2025, to September 30, 2025. Data collection occurred from January 9 to March 28, 2025 (3 months). The study population consisted of all pregnant women who consulted at the Angré University Hospital Center. Pregnant women with a gestational age of ≥11 weeks of amenorrhea who had actually begun their prenatal care were included in the study. That is, those who had undergone a dating ultrasound (11th - 13th weeks of gestation). Among these pregnant women, some were randomly selected each week for inclusion in the study. Pregnant women selected according to the inclusion criteria who declined to participate in the study (those who closed the questionnaire without answering the questions) were not included. Data were collected using a questionnaire created from Google Forms and sent via an internal messaging system (WhatsApp) to the pregnant women included in the study.

The questionnaire comprised four groups of questions. The first group concerned sociodemographic data. The second group of questions related to pregnant women's knowledge of dengue fever. The third group of questions concerned pregnant women's attitudes toward dengue fever. The fourth group of questions related to pregnant women's behavior in the face of dengue fever. For each question in the second through fourth groups, there were five possible answers accord-

ing to the Likert scale.

We focused on the following variables:

- Quantitative variables: maternal age, parity.

- Qualitative variables: occupation, education level, municipality of residence, knowledge about dengue (mode of transmission, signs, complications of dengue in the mother-child dyad), attitudes towards dengue (willingness to sleep under insecticide-treated bed nets, environmental maintenance practices), practices related to dengue (self-medication, use of traditional medicines, routine use of antimalarial drugs).

The threshold was set at 60% for each correct answer. A threshold of 60% - 90% correct answers was considered good. Above 90% correct answers were considered excellent.

Anonymity and informed consent were respected according to the Helsinki Protocol.

3. Results

3.1. Frequency

During the study period, we recorded a total of 1050 consultations, including 703 antenatal consultations (ANC). Among these, 328 pregnant women's records were selected based on the inclusion criteria. Ultimately, 305 pregnant women were included in the study (Figure 1).

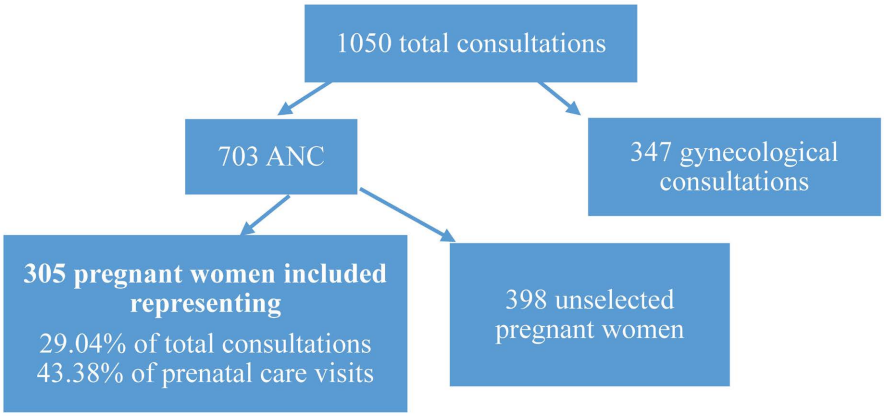

Figure 1. Patient selection flowchart.

3.2. Socio-Demographic Parameters

The mean age was 34.46 years, with a range of 29 to 42 years. The standard deviation was 4.027 years.

Patients had few children (pauciparous) in 53.11% of cases. Multiparous women represented 32.13%, primiparous women 7.87%, and nulliparous women 6.89%.

Occupation was grouped by activity class or sector. Housewives were considered to be all women with no income-generating activity (20%). The informal sec-

tor consisted of all women with gainful employment without formal income declaration or business registration (51.80%) (Table 1).

Table 1. Distribution of pregnant women according to occupation.

Occupation	Effective	Percentage (%)
Housewife	61	20
Student	42	13.77
Informal sector	158	51.80
Junior manager	29	9.51
Senior executive	15	4.92
Total	**305**	**100**

The informal sector accounted for 51.80% of pregnant women.

Place of Residence

The place of residence was distributed according to the municipalities. Thus, 59.34% of the patients came from the municipality of Cocody (Table 2).

Table 2. Distribution of pregnant women according to place of residence.

Municipalities	Effective	Percentage (%)
Cocody	181	59.34
Abobo	72	23.61
Bingerville	36	11.80
Other municipalities of Abidjan	11	3.61
Outside of Abidjan	5	1.64
Total	**305**	**100**

In 59.34% of cases, the pregnant women lived in the commune of Cocody.

Educational Level

Educational level was divided into four groups: none (29.18%), primary (4.92%), secondary (44.26%), and higher education (21.64%).

3.3. Pregnant Women's Knowledge of Dengue

The pregnant women's knowledge of dengue was assessed using five closed-ended questions.

Have you ever heard of dengue?

The number of responses was "yes" in 64.92% (n = 198) and "no" in 35.08% (n = 107) (Figure 2).

If the answer was yes, then the means by which the information was provided should be specified (hospital, billboard, social media, television, other) (Table 3). The number of pregnant women who responded was 198.

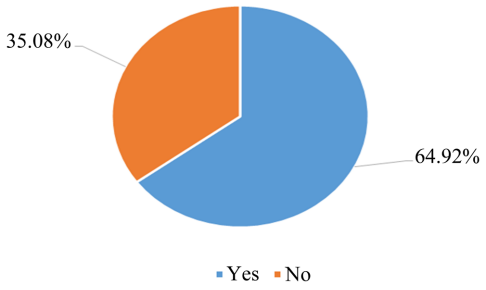

Figure 2. Distribution of pregnant women according to prior information about dengue.

Table 3. Distribution of pregnant women according to the method of information on Dengue.

Information channel	Effective	Percentage (%)
Television	85	42.93
Advertising panel	59	29.80
Hospital	43	21.71
Social networks	9	4.54
Other	2	1.01
Total	**198**	**100**

The "other" answer referred to information received from a friend or family member.

Other questions on pregnant women's knowledge about dengue fever

The other questions relating to knowledge were grouped in Table 4. The neutral response was "I don't know." Pregnant women who had never heard of dengue fever also answered the questions, resulting in a sample size of 305.

Table 4. Distribution of pregnant women according to questions related to knowledge about Dengue.

	I completely disagree		Disagree		Neutral		In agreement		In complete agreement	
	n	%	n	%	n	%	n	%	n	%
Dengue is a disease transmitted by a mosquito called Aedes or tiger mosquito	0	0	0	0	5	1.64	25	8.20	275	**90.16**
There are 3 types of dengue: classic asymptomatic hemorrhagic	0	0	7	2.29	100	32.79	76	24.92	122	**40**
Dengue fever manifests as a flu-like syndrome (fever, muscle and joint pain, nausea, vomiting, headaches)	0	0	0	0	0	0	118	38.69	187	61.311
A pregnant woman cannot transmit dengue fever to her baby	24	7.87	32	10.49	67	21.98	105	34.42	77	**25.24**
Complications of dengue fever include hemorrhage, recurrence in the mother and fetus, miscarriage, premature birth, and low birth weight	14	4.59	23	7.54	201	65.90	61	20	06	**1.97**

Pregnant women were aware of the mode of dengue transmission in 90.16% of cases. Complications of dengue during pregnancy were known in 1.97% of pregnant women.

3.4. Attitudes of Pregnant Women towards Dengue

The attitudes of pregnant women towards dengue are presented in Table 5.

Table 5. Distribution of pregnant women according to attitudes towards dengue.

	I completely disagree		Disagree		Neutral		In agreement		In complete agreement	
	n	%	n	%	n	%	n	%	n	%
To avoid dengue fever, you are willing to sleep under a mosquito net	0	0	0	0	7	2.30	124	40.66	174	57.04
To prevent dengue fever, you are willing to destroy stagnant water	0	0	0	0	0	0	70	22.95	235	77.05
To avoid this, you are willing to prevent water from stagnating in the cupolas of the flower pots	0	0	141	46.23	5	1.64	140	45.90	19	6.23
You make it a habit to change the reserve water in your household container every week	48	15.74	257	84.26	0	0	0	0	0	0

In 84.26% of cases, pregnant women were unwilling to change the water in their containers weekly.

3.5. Pregnant Women's Practices regarding Dengue Fever

The pregnant women's practices concerned their behavior in the event of flu-like symptoms. These included self-medication, the use of traditional remedies, the use of antimalarial drugs, and consulting a healthcare professional. Pregnant women could only choose one response based on the practice that dominated their behavior. The results are presented in Table 6.

Table 6. Distribution of gastants according to practices in the face of an influenza-like syndrome.

Practices	Effective	Percentage (%)
Self-medication	201	65.90
Traditional medicines	53	17.38
Antimalarial	46	15.08
Consultation with a healthcare professional	5	1.64
Total	305	100

Self-medication was practiced by 65.90% of pregnant women experiencing flu-

like symptoms.

The pregnant women were asked if they slept under insecticide-treated mosquito nets. The results are presented in Figure 3.

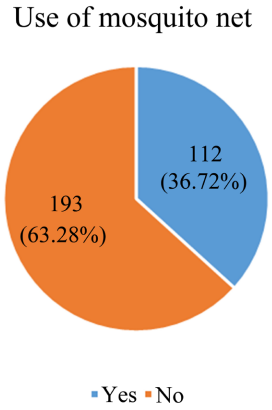

Figure 3. Distribution of pregnant women according to mosquito net use.

Pregnant women did not sleep under an insecticide-treated mosquito net in 63.28% of cases.

4. Discussion

The study's limitations are represented by a selection bias. In fact, the exclusive selection of pregnant women who underwent ultrasound dating between 11 and 13 weeks of amenorrhea may exclude some patients with limited access to prenatal care.

The frequency found was 29.04% of all consultations and 43.38% of gynecological consultations. This frequency is close to 50%. We were thus able to recruit nearly half of the pregnant women during this study period.

The pregnant women included in the study were young, with a mean age of 34.49 years (±4.027). This age of full reproductive activity corresponds to the age at which conception is planned and is directly related to the low parity observed in this study. The young age of our pregnant women certainly reflects that of the general population of Côte d'Ivoire, where nearly half the population is under 60 years old [10]. Most of the pregnant women lived in the Cocody district, which is home to the Angré University Hospital. In this municipality, sanitation is fairly well maintained, as it is one of the more affluent areas of Abidjan. However, the problem arises from the presence of certain plants (traveler's tree, banana tree) in households. These hollow-trunked plants can retain rainwater, creating stagnant water conducive to the development of mosquito larvae. It is also in this relatively upscale area of Abidjan that many residents have flowerpots with domes that can collect stagnant water, creating ideal breeding grounds for parasites. This municipality is prone to dengue fever epidemics, as demonstrated by Beugré's study on certain entomological parameters of mosquitoes in the Cocody-Bingerville health district [11]. The majority of pregnant women had a secondary education. A well-

informed pregnant woman can better understand the consequences of dengue fever for both the pregnant woman and the fetus.

The vast majority of pregnant women included in the study had already heard about dengue fever through television. The Ministry of Health, Public Hygiene, and Universal Health Coverage has frequently conducted both mass and community-based awareness campaigns about dengue. Those using television appear to be the most effective. It is a reliable channel, especially when informational spots are broadcast during prime time, from 7 p.m. to 11 p.m. The pregnant women had a good understanding of the human-to-human transmission of dengue, which occurs via a vector: the Aedes mosquito. However, most of them were unaware that in utero transmission of dengue is possible. This lack of knowledge is a factor that could contribute to the absence of effective prevention measures, such as sleeping under insecticide-treated bed nets. This ignorance exposes the fetus to complications such as abortion, acute fetal distress, low birth weight, prematurity, intrauterine growth retardation, malformations and fetal death in utero [6].

Knowledge was insufficient regarding the complications of dengue. Pregnant women's awareness of these maternal and fetal complications prevents trivializing this re-emerging disease, which is directly linked to climate change. Indeed, dengue can be responsible for maternal and fetal mortality and morbidity [12]-[14].

The only positive behavior among pregnant women above the 60% threshold was the willingness to eliminate standing water. This preventative measure protects against dengue fever, as well as other mosquito-borne diseases. Just over half of the pregnant women favored sleeping under a mosquito net. This measure is particularly effective if one sleeps under it even during naps. Indeed, the Aedes mosquito is diurnal and feeds on human blood both day and night.

Knowledge influences attitudes to some extent. Both, in turn, influence practices to some extent. Thus, more than half of the pregnant women surveyed admitted to self-medicating primarily for flu-like symptoms. This reflects the trivialization of flu-like symptoms, which are present in several illnesses. The danger of self-medication is that it will often alleviate certain signs, such as joint pain, without actually treating the disease, especially when the patient is using non-steroidal anti-inflammatory drugs. These anti-inflammatory drugs are responsible for a higher risk of hemorrhage when dengue fever and pregnancy are combined, especially in the third trimester. While it is true that dengue fever has no specific treatment, consulting a healthcare professional for a health check-up or dengue test can help ensure more appropriate care. This is especially important because dengue fever during pregnancy is associated with adverse outcomes (miscarriage, prematurity, intrauterine growth restriction, fetal death). This is highlighted in a meta-analysis by Paixão [15].

5. Conclusions

This study involved nearly half of the pregnant women attending antenatal care (ANC) during the data collection period. It focused on a young population, most

often with few children, and with a secondary education. It appears that pregnant women have a good general knowledge of dengue fever. However, their knowledge is limited regarding the effects of dengue on pregnancy. This lack of awareness of the complications of dengue probably contributes to the finding that attitudes and practices remain unchanged.

This highlights the need for dengue education for pregnant women. Therefore, pregnancy, which leads women to attend health facilities monthly, should be an opportunity for healthcare professionals to address this educational gap regarding dengue through community-based awareness sessions during ANC visits, especially during the rainy season. This can be arranged while waiting in the common room.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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