

## PREGNANT AWARENESS ABOUT ZIKA VIRUS INFECTION DURING PREGNANCY

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**ABSTRACT | Introduction:** The infection by Zika virus (ZIKV) on pregnancy has been related to several birth defects such as congenital microcephaly and fetal deaths. According to what is currently known about this infection, the only way to avoid it is prevention. **Objective:** Evaluate the pregnant women awareness about usual ZIKV infection risks. **Methods and materials:** This is a quantitative descriptive observational report developed at an outpatient clinic in Salvador/BA. The analysis group was composed by 60 pregnant women of usual risk from September to October of 2016. The data acquisition was done by structured instruments such as questions regarding sociodemographic data and ZIKV infection risks. **Results:** Approximately 97% of the subjects affirmed to know how the disease spread occurs, and all of them have mentioned the *Aedes aegypti* mosquito. The most commonly reported indications and symptoms were maculopapular rash (77.8%), headache (66.7%) and pruritus (61.1%). The most frequent complication was microcephaly (98.3%). About ways of prevention from the disease, 93.3% affirmed that they are aware of the virus. The use of the repellent lotion was the most mentioned (96.5%). Just 51.8% claimed to always do some prevention measures in their daily basis. Besides 88.6% of the subjects who had unplanned pregnancy allege that they would not wish to become pregnant with real chances of being infected by the virus. **Conclusion:** the studied group is aware of the infection risks by ZIKV, but there is a lack of prevention acts.

**Keywords:** Zika Virus; pregnancy; prevention.

## INTRODUCTION

Nowadays there is great interest from the international scientific community about arboviruses once there is an increasingly number of disease cases caused by these kinds of virus. The Zika virus (ZIKV) is an arbovirus from the Flavivirus genus and belong to the Flaviridae family, originally isolated in 1947 in the Zika Forest, Uganda.<sup>1,2</sup>

ZIKV most common transmission occurs through the *Aedes aegypti* mosquito bite, however there are reports that the *Aedes albopictus* mosquito can also be a vector for this virus.<sup>3</sup> Alternative ways ZIKV transmission have been in discussion from the detection of viral RNA in samples of blood, urine, semen, saliva, cerebrospinal fluid, and amniotic fluid.<sup>5</sup> The Centers for Disease Control and Prevention (CDC) affirm that sexual transmission is possible.<sup>4,7</sup>

The ZIKV infection is a self-limiting disease and usually shows no serious damages to the human organism.<sup>2</sup> Clinical diagnosis may be asymptomatic or present signs and symptoms such as low fever (less than 38.5 ° C), pruritic maculopapular rashes, mild headache, myalgia, arthralgia, joint edema and non-purulent conjunctivitis.<sup>2,4</sup>

In pregnant women, ZIKV infection has been associated to complications such as fetus-congenital-microcephaly and fetal deaths. Between March 2015 and February 2016, more than 4,000 cases of this complication were reported among newborns from Brazilian mothers diagnosed with the infection. This represents an increase of an approximately 20 times the number of cases comparing with previous years.<sup>5</sup> Microcephaly may be accompanied by epilepsy, cerebral palsy, retarded cognitive development, motor and speech, and vision problems.<sup>2,8</sup>

From this described association between microcephaly and ZIKV infection, the World Health Organization (WHO) recommends the pregnant women to prevent themselves against mosquito bites, once there is neither existence of vaccine nor specific treatment for this disease.<sup>1</sup> According to Brazil's Ministry of Health, the prevention for this infection consists on the control of the mosquito proliferation and the adoption of individual protection measures.<sup>4</sup>

Therefore, the relevance of this study is mainly due to the significant increase in the number of cases of newborns with complications caused by ZIKV infection during pregnancy. Babies who were born with health complications have large psychosocial impacts on their family members' lives. Furthermore, these infection cases that result in disabled newborns represent a much greater cost to government than preventive actions, according to Brunoni (2016, p.3299)

It is the duty of the State, society and family to ensure to the disabled person the achievement of the rights related to life, health, education, social security and rehabilitation, in order to guarantee their personal, social and economic well-being.<sup>9</sup>

Plus, it is known that access to information increases knowledge, which eases the understanding of health information and the prophylactic and therapeutic procedures.<sup>10</sup> Therefore, the objective of this study was to evaluate the pregnant women awareness of usual risks to ZIKV infection in pregnancy.

## MATERIAL AND METHODS

This is a quantitative descriptive observational study placed in the Ambulatório Docente Assistencial da Bahiana (ADAB), in the city of Salvador, Bahia, Brazil. The sample was acquired by methodology of convenience. Pregnant women at usual risk who were 18 years and over were included, enrolled in ADAB prenatal care, in the months of September and October 2016.

All participants have agreed to participate and have signed the Informed Consent Form containing information about the study. This study was approved by the Ethics Committee of Human Being Research from BAHIANA – School of Medicine and Public Health (number 1.719.181 / 2016, CAAE: 57162016.3.0000.5544).

The patients approach included an interview and the form containing structured questionnaires in which topics were related to sociodemographic data for identification and characterization for the subjects (age, self-reported skin color, marital status, schooling,

family income and occupation), also questions about ZIKV awareness (ways of transmission, diagnostics and symptoms, complications, prevention and main information sources).

Data analysis was performed in a descriptive way, with a mean and standard deviation of continuous variables with normal distribution, and a frequency of categorical variables. The database was built using SPSS software version 21.0 for MS Windows Operational System.

## RESULTS

Sixty pregnant women were interviewed. The mean age was 28.2 years ( $\pm 5.72$ ). From the questionnaires about personal and socio-economic information, 53.3% were black, 56.7% were married or had a stable union, 55% had High School education, 71.7% had a monthly family income from 1 to 3 minimum wages and 41.7% worked on formal jobs (Table 1).

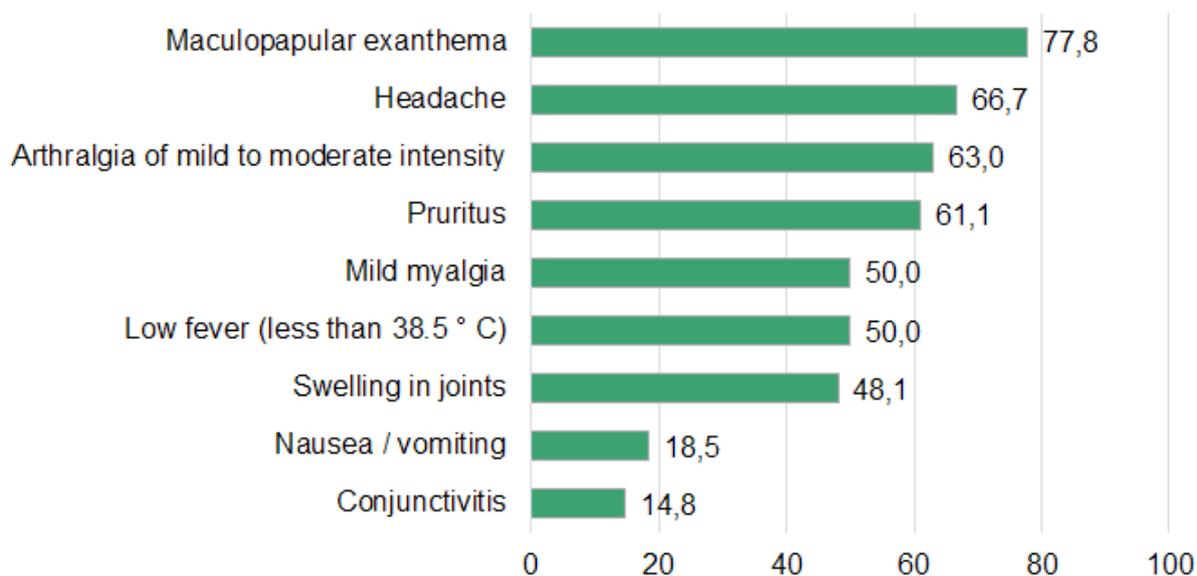
**Table 1:** Sociodemographic characteristics of the pregnant women in the studied sample, followed in ADAB. Salvador, 2017.

Characteristics	N	%
Self-reported color skin		
White	8	13,3
Brown	20	33,3
Black	32	53,3
Marital Status		
Single	22	36,7
Married/ Stable Union	34	56,7
Widow	1	1,7
Others	3	5
Schooling		
Knows how to read and write/Elementary School	14	23,4
High School	33	55
Higher Education	13	21,7
Family Incomes in monthly minimum wages		
Less than 1	15	25
1 to 3	43	71,7
3 to 5	2	3,3
Occupation		
Formal bond work	25	41,7
Autonomous	13	21,7
Unemployed	20	33,3
Othres	2	3,3

\* Value of the minimum wage in 2016: R\$ 880,00.

In the interview related to ZIKV infection, 96.7% of the pregnant women claimed they knew how the disease transmission occurs. When questioned about how were the transmission ways, 100% of pregnant women mentioned the *Aedes aegypti* mosquito bite. Only 8.5% reported also the *Aedes albopictus* mosquito. The second most frequently (27.6%) mentioned transmission way was sexual intercourse without condoms. The vertical transmission was not mentioned.

Regarding the clinical diagnosis, 86.7% of the pregnant women said they knew all the main signs and symptoms of the disease. The most commonly reported were maculopapular rashes (77.8%), headache (66.7%) and pruritus (61.1%); the least expressed were nausea / vomiting and conjunctivitis, with 18.5% and 14.8%, respectively (Graph 1).



**Graph 1:** Knowledge of sampled pregnant women in ADAB on the main signs and symptoms of ZIKV infection (%). Salvador, 2017.

Asked about the complications, three subjects (5%) affirmed that they did not know possible complications on their babies if they would be infected by the virus. The most cited was a microcephaly with 98.3%. The other complications were mentioned by less than 50%, such as retarded cognitive, motor and speech growth (48.3%), vision and hearing problems (37.9%), cerebral palsy (29.3%), death fetal (29.3%) and epilepsy (6.9%).

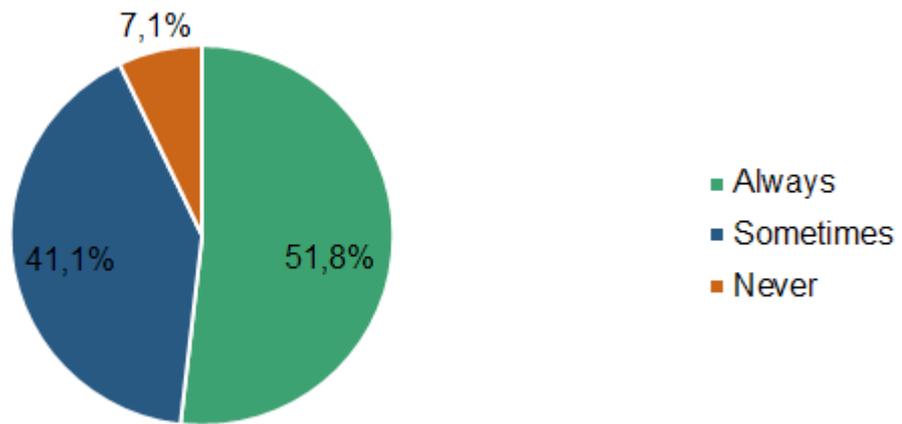
About prevention, 93.3% of the subjects claim to be aware of how to prevent ZIKV infection. All forms of prevention were mentioned more than 60% of the times. (essa frase tb ta esquisita) The most mentioned was the use of mosquito repellent (96.5%) and the least mentioned (61.4%) was using bed nets. In addition, 5.3% of the subjects referenced the use of the insecticide and the house cleaning as ways to prevent the mosquito attacks (Table 2).

**Table 2:** Knowledge of sampled pregnant women attending the ADAB on the main measures to prevent ZIKV infection (N = 56). Salvador, 2017.

Prevention methods	%
To use repellent	96,5
To fill the plates of potted plants with sand	89,5
To keep cans, buckets and jars with the opened side down	89,5
To cover the pool or to treat it with chlorine	80,7
To keep the tires in covered locations	78,9
To use clothes that protect exposed parts of the body	77,2
To use protective screens on doors and wiindows	77,2
To water only the soil when it comes to plants that accumulate water	73,7
To cover rubble or leftover works	70,2
To rest under mosquito nets	61,4
Others	5,3

According to the 56 pregnant women who said they knew how to prevent themselves, 51.8% said to always do some of those items on a daily basis, 41.1% sometimes and 7.1% never (Graph 2). Also, 66.7% of the subjects reported that they received guidance on ZIKV infection prevention ways during prenatal care.

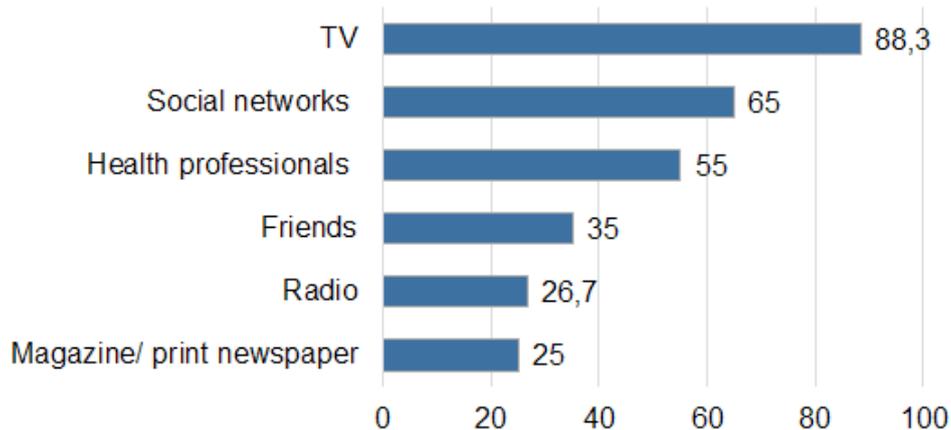
When asked how they would feel about catching the disease during pregnancy, majority said they would be worried (63.8%), 31% said they would keep calm and only 5.2% claimed they would get anxious.



**Graph 2:** Frequency of preventive measures performed by pregnant women in the sample accompanied by ADAB (%). Salvador, 2017.

In the studied group, 58.3% of the subjects have not planned their pregnancy. Which, 88.6% would not wish to become pregnant now with a real possibility of being infected by the virus and 86.7% did not

plan to abort pregnancy by fearing of a chance to catch the disease. The main information media mentioned by the subjects are TV (88.3%) and social networks (65%) (Graph 3).



**Graph 3:** Main means of information of the sampled pregnant women attending ADAB (%). Salvador, 2017.

## DISCUSSION

Among sociodemographic characteristics of the studied group, it was noticed that the majority of the subjects had high school or higher degree, potentially reflecting a good level of schooling. This data differs from the results found in other studies also performed with pregnant women subjects.<sup>11,12,13,14,15</sup> This scholar level on subjects is not expected in general to be found in a health care by the Sistema Único de Saúde (Health Unique System - Brazil's public health care system).

This particularity can be related to an increasingly growth of admissions in high school and graduation degree that has occurred in recent years. Lima et.al. (2016) stated that the number of study years is directly related to how the information is understood, like noticing pathologies and doing the right therapeutic procedures.<sup>11</sup>

Regarding the knowledge on how the transmission occurs, the results confirm that the majority of the subjects know the main ways of disease transmission, mentioning *Aedes aegypti* mosquito as the main vector. Vertical transmission was not reported,

however the awareness of fetal assault was quoted in the responses concerning complications of infection. Another form of transmission of the virus also confirmed, the sexual intercourse, was little mentioned, revealing that this information is still not consistent enough for them to be treated as a form of catching the disease.

However, several studies have shown that the sexual transmission of some diseases is known by pregnant women.<sup>12</sup> Source et.al. (2012), when consulting pregnant women about Acquired Immunodeficiency Syndrome (AIDS), 90.2% of them mentioned unprotected sexual intercourse as the main form of getting infected by the Human Immunodeficiency Virus (HIV).<sup>16</sup> Costa et.al. have found on pregnant women subjects absolute knowledge about the syphilis infection caused by sexual intercourse.<sup>12</sup>

The lack of attention by the subjects about this transmission way may be related to the fact that the ZIKV sexual pathway is the most recently broadcasted form of catching a disease comparing to others like AIDS or Syphilis. Their omission may also be explained by being associated with taboos frequently mentioned by pregnant women and/or their partners who correlate the practice and frequency of sexual activity with possible adverse pregnancy outcomes. Such thinking may lead to a reduction in the frequency of sexual practice during pregnancy and to a possible disregard for protection.

In addition, there is an already known difficulty for women in negotiating the condom use with their partners.<sup>17</sup> Also relevant is the common sense that pregnant women do not need to use condoms since they are pregnant. In addition, they remain unable to acquire any sexual infection if their partners are or claim to be faithful to their relationships.

Regarding the clinical forms of the disease, the pregnant women have shown good knowledge about the ZIKV infection, mentioning the presence of pruritic maculopapular rash, mild to moderate arthralgia and headache, as the main signs and symptoms of the disease. As for the complications to the fetus, the most cited was microcephaly. Others were mentioned with a frequency less than 50%.

These data have a strong impact on the subjects,

with 69% of them feeling worried or anxious about the possibility of contracting the disease during the pregnancy period. These results have demonstrated that the interviewed women are aware of the risk of fetus complications.

However, only 51.8% of the pregnant women say they perform some preventive measures on their daily basis, showing little commitment to the right prophylaxis procedures, increasing then the risk of exposure and associated complications. In the same way, the work produced by Matos et.al. (2009) state that patients become more vulnerable to illness by ignoring the forms of AIDS prevention and treatment.<sup>13</sup>

The same is true for other diseases, especially those in which health education is the only or most effective way to reduce the risks of exposure and prevent complications.<sup>17</sup> In this context, ZIKV infection nowadays fits perfectly as an example where health education still presents itself as the main (if not the only) effective instrument to avoid contamination.

Although information is clearly an important instrument for access and morbidity reduction, in the analysis of the data of the present study, the performance of health care professionals did not represent main information ways for the subjects. It is noticed that there is a predominance of information coming from the media, especially television and social networks. This is probably related to the gap between the professional and the patient in the present care model, perhaps as a consequence of the differences produced by socio-cultural issues, the use of scientific language or even the undervaluation of aspects related to their daily lives.<sup>13</sup>

Marchon et.al (2015) affirm that the health professional must adapt his dialogue to each patient, considering, mainly, the degree of education and the culture of that individual. In this sense, the absence of pathological findings, common to prenatal care of pregnant women at normal risk, may culminate in a certain lack of interest in the physiological aspects observed during the "normal evolution" of a pregnancy devoid of major complications.<sup>19,20</sup>

This interest for searching a specific disease or morbid state is a very peculiar characteristic of professionals who value the pathological. The lack of

interest in the issues of physiological events related to pregnancy can culminate in the development of fast, disease-focused consultations with little room for reflection on the need to take preventive measures or clarify doubts.

However, although they were not the only information sources to the pregnant women, the health professionals who attended the subjects of this study have given advices to 66.7% of them about how to prevent ZIKV infection. These expressive indicators may be related to the peculiarity of the promoted service in an academic clinic.

In order to analyze the relationship between the implementation of educational activities and the expansion of knowledge, Fonte et.al. (2012) have observed that the presence of educational activity provided an increase on the awareness in 61% of the subjects about sexually transmitted diseases. However, data produced by Branco et.al. (2012) have shown that only 16.2% of the subjects received guidance on prevention of toxoplasmosis in prenatal care, and Matos et.al. (2009) reported that 35.5% had access to information about AIDS disease.<sup>13,16,17</sup>

In the context of a linked world where information is accessible and fast, the media has proven to be, still, the primary source of information about ZIKV infection. Aguiar (2016) states that this communication channel consists an interface between scientific knowledge and the population. However, the same author questions the way the media has been playing this role. According to Rangel and Aguiar (2008 and 2016, respectively), media focuses on information in a complaint way and emphasizes the human-being suffering, giving up important factors in the health field, such as allowing society the access to information.<sup>21,22</sup>

Another relevant point raised by Aguiar is that unfounded information are broadcasted such as, in the specific case of ZIKV infection, the correlation between microcephaly and administration of expired vaccines. Also, it is also a question if the media, linked to the spectacularity, would be interested in diseases outside an epidemic outbreak.<sup>21</sup>

From the 58.3% of the women with unplanned pregnancy, 88.6% of them would not wish to become pregnant with the possibility of being infected by

the virus. This data shows that, despite the fact that most pregnant women are aware of the ZIKV infection, the absence of vaccine and treatment and the failure to perform the prophylactic measures have led to an increasing concern and /or anxiety of these women.

According to Piccinini et.al. (2008), pregnancy is marked mainly by biological and psychological changes in the life of a pregnant woman.<sup>23</sup> The epidemiological outbreak of ZIKV infection has consequences on psychological changes, bringing up feelings such as fear and anxiety. In the other hand, despite this situation, 86.7% of women do not think about giving up pregnancy because of the possibility of catching the virus.

The main limitation of this study is that the sample was performed with 60 pregnant women and elaborated by the convenience method. In addition, other topics were not explored, such as infection previous contacts, quality of by health professionals and the media provided information and which forms of prevention were practiced by pregnant women who reported prophylaxis in their daily lives.

## CONCLUSION

The results showed a good information level from the subjects about ZIKV infection. However, this does not translate into effective access to prevention and reduction of pregnancy concerns on this period. The most significant fact generated by this mismatch is that a significant percentage of subjects have reported that they would not want to become pregnant at the time of the research as a consequence of the possibility of being infected with the virus.

The main conclusion evidenced in this research is that access to prophylactic measures should be based on consistent information of technical aspects and the use of appropriate information to the target population of care. Specifically in the actions developed in the ADAB, it was revealed the need to improve the qualification of health education actions with the introduction, for example, of distribution of information about topics and educational videos on waiting rooms.

## COMPETING INTERESTS

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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