



CORRESPONDENCE

Diagnosis, management and follow-up of pregnant women with Zika virus infection: A preliminary report of the ZIKERNCOL cohort study on Sincelejo, Colombia



KEYWORDS

Zika;
Pregnancy;
Epidemiology;
Colombia;
Latin America

Dear Editor,

Zika virus infection (ZIKV) has emerged as a significant threat for the health of pregnant women and newborns in populations living or visiting Latin America since the epidemic begun in 2015 [1,2]. Reported possible consequences included particularly the risk of associated microcephaly [3,4], still to be proved in detail and confirmed, but potentially of other congenital defects. In this setting and needing rapid assessment of the consequences of ZIKV during pregnancy, a retrospective preliminary analysis of a cohort of pregnant women with RT-PCR confirmed ZIKV is here presented (*Zika en Embarazadas y Recién Nacidos en COlombia*, ZIKERNCOL).

During January 2016, the group begun to collect data of pregnant women with symptoms of ZIKV who received care and were hospitalized at one of the two main maternity units in Sincelejo, Sucre (north, Caribbean coast region), Colombia (Hospital Universitario de Sincelejo and Clínica Santa María), an endemic department for Zika since last trimester of 2015. In this initial preliminary report, findings of the first 28 pregnant women with confirmed by RT-PCR ZIKV under follow-up, are described.

From them, 21 (75%) reported ZIKV symptoms during pregnancy, 7 (25%) reported no specific symptoms (Table 1). RT-PCR tests confirmed the diagnosis in all of them. RT-PCR and serologies were all negative for dengue (including NS1) and chikungunya. Infection occurred during the first trimester for 1 (4%) women, the second for 12 (43%), and the third for 15 (54%) (Table 1). Signs and symptoms included rash (71%), fever (46%), arthralgias (39%), and conjunctivitis (36%), among others (Table 1). All

patients presented mild symptoms of disease, all of them with a Glasgow coma scale of 15/15 (Table 1). Hospitalization last for a median duration of 48 h (up to 72 h). Demographic and pregnancy characteristics are described in Table 1. STORCH panel as well HIV and HBV serologies, and malaria blood smears were performed on them, just being positive three of the serological tests for IgG anti-*Toxoplasma gondii* and one for IgG anti-rubella (Table 1). Physical examination at initial consultation/hospitalization was normal in most patients (Table 1). Of them, 39% presented leukocytosis with neutrophilia (43%), 50% anemia, high ESR (32%) and high levels of LDH (11%) and CPK (4%) (Table 1). Urinalysis and urocultures were only positive in one patient (isolating *Escherichia coli*). In one case a cytology found *Trichomonas trophozoites*. Ultrasounds in two cases suggested brain calcifications (amniocentesis will be performed on them) as well in one women there was a twin pregnancy. According to national and international protocols, all of them have been included into surveillance and high obstetrical risk with a multidisciplinary approach, considering weekly fetal ultrasounds up to delivery.

Pregnant women in endemic areas should protect themselves from mosquito bites with multiple well-known described measures [1]. In this preliminary report we showed clinical and laboratory characteristics of a cohort under follow-up which will be furtherly assessed regard pregnancy outcomes. Ongoing surveillance and evaluation of these cases are important to describe the phenotypic spectrum of potential ZIKV-associated congenital infections as has been already reported in Brazil [4–6]. Particular concern in this report is related to the finding of brain calcifications at fetal ultrasounds in RT-PCR ZIKV infected mothers, one of them with positive IgG serology for toxoplasmosis and the other with no other laboratory finding. Ultrasound should include careful assessment of the fetus for brain anomalies, including brain calcifications and microcephaly, which is mostly detected in the late second and early third trimesters of pregnancy [4,7]. Nevertheless, additional fetal ultrasounds should be performed later in pregnancy [7]. As has been performed in this cohort, is particularly clear the need for the assessment of other factors previously associated with microcephaly (infectious and non-infectious) [2]. Finally, as has been suggested, adherence to protocols related to microcephaly and ZIKV is of utmost importance, wide training and education of

Table 1 Demographical, obstetrical, clinical and laboratory characteristics of 28 pregnant women initially included in the ZIKERNCOL cohort, Sincelejo, Colombia.

Characteristics	Summary measures	
	Mean	Interquartile range
Age (years-old)	28.0	26.0–30.0
Gestational age (weeks)	27.2	17.9–38.1
Symphysis-fundal height (cms)	23.0	17.8–31.3
Fetal heart rate (bpm)	140	134–149
	n	%
<i>Gravidity</i>		
Primigravidae	8	29
Multigravidae	20	71
Previous ectopic pregnancies	1	4
Previous miscarries	6	21
Previous C-sections	8	29
Antenatal care during current pregnancy	6	21
<i>Personal history</i>		
History of gestational diabetes	0	0
History of thyroid alterations	0	0
History of genetic disorders	0	0
Obesity	1	4
High blood pressure	1	4
Systemic erythematous lupus	1	4
Family history of high blood pressure	5	18
Family history of diabetes	1	4
Family history of nephropathies	1	4
<i>Clinical features</i>		
Rash	20	71
Fever	13	46
Arthralgia	11	39
Conjunctivitis	10	36
Cephalea	12	43
Abdominal pain	11	39
Myalgia	9	32
Malaise	4	14
Anemia	4	14
Pelvic pain	3	11
Chills	2	7
Retroocular pain	2	7
Edema in lower limbs	2	7
Hemiparesis	1	4
Asthenia	1	4
Jaundice	1	4
Lumbar pain	1	4
	Mean	Interquartile range
<i>Physical examination</i>		
Systolic blood pressure (mmHg)	110	100–120
Diastolic blood pressure (mmHg)	70	68–80
Heart rate (bpm)	80	76–81
Respiratory rate (bpm)	18	17–20
Temperature (°C)	37.0	36.6–37.0
	n	%
<i>Serological tests (positive)</i>		
HIV	0	0
Hepatitis B virus	0	0
VDRL/FTA	0	0
<i>Toxoplasma</i> IgG	3	11

Table 1 (continued)

Characteristics	Summary measures	
	Mean	Interquartile range
Rubella IgG	1	4
CMV	0	0
Herpes simplex type 1	0	0
Herpes simplex type 2	0	0
Epstein–Barr virus	0	0
Rheumatoid factor test	0	0
	Mean	Interquartile range
<i>Complete blood count and chemistry findings</i>		
White blood cells (/mL)	9.9	7.8–11.1
Hemoglobin (g/dL)	11.6	10.7–12.5
Hematocrit (%)	33.1	31.5–37.4
Platelets (cells/mL)	249,000.0	193,250.0–297,750.0
Neutrophils (%)	70.9	68.8–73.1
Erythrocyte sedimentation rate (ESR) (mm)	40.0	36.0–50.0
Lactate dehydrogenase (LDH) (IU/L)	414.0	372.0–577.5
Creatine phosphokinase (CPK) (IU/L)	53.0	45.0–179.0

healthcare workers, including travel medicine practitioners is also of high relevance with regard to this threat which can affect pregnant women living or visiting endemic areas, particularly in Latin America.

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Conflict of interest

None of the authors report conflict of interests.

References

- [1] Rodríguez-Morales AJ. Zika: the new arbovirus threat for latin America. *J Infect Dev Ctries* 2015;9:684–5.
- [2] Rodríguez-Morales AJ. Zika and microcephaly in Latin America: an emerging threat for pregnant travelers? *Travel Med Infect Dis* 2016;14(1):5–6.
- [3] Mlakar J, Korva M, Tul N, Popovic M, Poljsak-Prijatelj M, Mraz J, et al. Zika virus associated with microcephaly. *N Engl J Med* 2016;374(10):951–8.
- [4] Schuler-Faccini L, Ribeiro EM, Feitosa IM, Horovitz DD, Cavalcanti DP, Pessoa A, et al. Possible association between Zika virus infection and microcephaly – Brazil. *MMWR Morb Mortal Wkly Rep* 2015;2016(65):59–62.
- [5] de Paula Freitas B, de Oliveira Dias JR, Prazeres J, Sacramento GA, Ko AI, Maia M, et al. Ocular findings in infants with microcephaly associated with presumed Zika virus congenital infection in Salvador, Brazil: JAMA ophthalmology; 2016. <http://dx.doi.org/10.1001/jamaophthalmol.2016.0267>.
- [6] Heymann DL, Hodgson A, Sall AA, Freedman DO, Staples JE, Althabe F, et al. Zika virus and microcephaly: why is this situation a PHEIC? *Lancet* 2016;387(10020):719–21.
- [7] Oduyebo T, Petersen EE, Rasmussen SA, Mead PS, Meaney-Delman D, Renquist CM, et al. Update: interim guidelines for health care providers caring for pregnant women and women of reproductive age with possible Zika virus exposure – United States. *MMWR Morb Mortal Wkly Rep* 2016; 2016(65):122–7.

Wilmer E. Villamil-Gómez
Infectious Diseases and Infection Control Research Group,
Hospital Universitario de Sincelejo, Sincelejo, Sucre,
Colombia

Programa del Doctorado de Medicina Tropical, Universidad
de Cartagena, Cartagena, Universidad del Atlántico,
Barranquilla,
Colombia

Committee on Travel Medicine, Pan-American Association
of Infectious Diseases, Quito, Ecuador

Committee on Zoonoses and Haemorrhagic Fevers,
Asociación Colombiana de Infectología, Bogotá, DC,
Colombia

Anibal Mendoza-Guete
Department of Gynecology, Hospital Universitario de
Sincelejo, Sincelejo, Sucre, Colombia

Elvira Villalobos
Department of Gynecology, Hospital Universitario de
Sincelejo, Sincelejo, Sucre, Colombia

Edgardo González-Arismendy
Department of Gynecology, Clínica Santa María, Sincelejo,
Sucre, Colombia

Ana María Uribe-García
Department of Gynecology, Clínica Santa María, Sincelejo,
Sucre, Colombia

Jaime Eduardo Castellanos
*Grupo de Virología, Universidad El Bosque, Bogotá, DC,
Colombia*

Alfonso J. Rodríguez-Morales*
*Infectious Diseases and Infection Control Research Group,
Hospital Universitario de Sincelejo, Sincelejo, Sucre,
Colombia*

*Committee on Travel Medicine, Pan-American Association
of Infectious Diseases, Quito, Ecuador*

*Committee on Zoonoses and Haemorrhagic Fevers,
Asociación Colombiana de Infectología, Bogotá, DC,
Colombia*

*Working Group on Zoonoses, International Society for
Chemotherapy, Aberdeen, UK*

*Public Health and Infection Research Incubator and Group,
Faculty of Health Sciences, Universidad Tecnológica de
Pereira, Pereira, Risaralda, Colombia*

*Corresponding author. Faculty of Health Sciences, Uni-
versidad Tecnológica de Pereira, Pereira, Risaralda,
Colombia. Tel.: +57 300 884 7448.

E-mail address: arodriguezm@utp.edu.co (A.J. Rodríguez-
Morales)

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