



## CORRESPONDENCE

# Healthcare students and workers' knowledge about Zika and its association with microcephaly in two cities of Colombia



## KEYWORDS

Zika;  
Healthcare workers;  
Knowledge;  
Medical education;  
Microcephaly

Latin America has recently witnessed the unprecedented arrival of emerging arboviruses such as Chikungunya and Zika [1,2]. This represents complex epidemiological scenarios, where assessing knowledge amongst healthcare students and workers about the epidemiology, symptoms and transmission of Zika in cities of Colombia would be relevant [3], even more in the upfront scenario of potential negative outcomes, especially during pregnancy as currently under report and investigation. Healthcare workers and students, today, even more than ever, need to be updated regard the evidences generated related to Zika and its associations with Guillain-Barré syndrome and microcephaly, including the fact this last is in fact linked to other multiple infectious and non-infectious factors [4].

An observational cross-sectional study was performed among assistants who attended a symposium on Zika on February 2016, simultaneously in two cities: Pereira and Dosquebradas, Risaralda (all of them, with incident cases of Zika, including pregnant women).

Attendees who agreed to be part (convenience sample), filled out a questionnaire about basic knowledge on the epidemiology, symptoms and prevention of Zika, particularly with emphasis on microcephaly as associated outcome (five questions), before and after the meeting.

A total of 325 questionnaires were applied (229 in Pereira, 119 before and 110 after the educative intervention; and 96 in Dosquebradas, 50 before and 46 after). The mean age of participants was 26.05 year-old ( $\pm 8.3$ ; range 16–60,

61.2% female), 20.3% were physicians (14.8% general practitioners and 5.5% specialists), 16.3% nurses, 37.2% medical students.

Knowledge about microcephaly was higher previous to the intervention in both cities ( $>97.5\%$ ), increasing above 99.1% them. Regard the definition of microcephaly, in both cities there was a low knowledge at baseline (no differences between cities,  $p = 0.233$ ), with significant increase in the degree of knowledge after intervention ( $>95.2\%$ ) ( $p < 0.0001$ ) (Table 1). Regard the cause and factors associated with microcephaly, there was low level of knowledge on baseline (no differences between cities,  $p = 0.085$ ), with increase in both ( $>41\%$ ), but significant only Pereira (32.8% vs 68.2%) ( $p < 0.0001$ ) (Table 1). For the definition of risk groups, where pregnant women have been defined, baseline knowledge was high in both cities ( $>96\%$ ), with not significant differences after intervention ( $p > 0.05$ ). Finally, regard the process for epidemiological notification of pregnant women with Zika, this still need to better explained, as the direction for it, it is no clear, as reflected for low level of knowledge, both, before and after intervention ( $p > 0.05$ ) (Table 1).

Despite its limitations, this is the first study to measure the level of knowledge on microcephaly possibly associated to Zika. Up to February 11, 2016, when the trainings were held, there were not officially confirmed cases of Zika associated microcephaly in Colombia, contrasting to its neighboring country of Brazil, where an upraise in this birth defect is being reported particularly in northeast of the country [5]. Since September 22, 2015, the first nine cases, were reported, until April 2, 2016, there have been 3,061 RT-PCR-laboratory-confirmed Zika cases in Colombia, as well 55,732 with syndromic definition cases. Among them, 10,816 have been reported in pregnant women (1,515 confirmed by RT-PCR) [6].

Then, preparedness regard microcephaly and other birth defects, that would be associated with Zika, but particularly their etiological differential diagnoses are of utmost importance [4]. Then, high incidence regions, should keep continue training healthcare workers and students, in order to achieve a timely diagnosis and optimal disease management in endemic regions, but also for travelers returning from these areas.

**Table 1** Results of questions about knowledge about transmission, epidemiology and symptoms of Zika and microcephaly in two cities of Colombia, Pereira and Dosquebradas, Risaralda, February 2016.

Questions	Cities											Pereira vs Dosquebradas		
	Pereira					Dosquebradas								
	Pre		Post		p	Pre		Post		p	Pre	Post		
	n	%	n	%		n	%	n	%		p	p		
1. Microcephaly is an alteration, according to age and gender, on the size of (answer: the head)														
Correct	116	97.5	109	99.1	0.341	50	100.0	46	100.0	N/A	N/A	N/A		
Incorrect	3	2.5	1	0.9		0	0.0	0	0.0					
Total	119	100.0	110	100.0		50	100.0	46	100.0					
2. The definition of microcephaly indicates a head size below the average (answer: by more than -2SD)														
Correct	66	55.5	108	98.2	<0.0001	22	44.0	44	95.7	<0.0001	0.233	0.7218		
Incorrect	53	44.5	2	1.8		28	56.0	2	4.3					
Total	119	100.0	110	100.0		50	100.0	46	100.0					
3. The cause of microcephaly included (answer: gestational diabete and TORCH)														
Correct	39	32.8	75	68.2	<0.0001	13	26.0	19	41.3	0.085	0.4913	0.0032		
Incorrect	80	67.2	35	31.8		37	74.0	27	58.7					
Total	119	100.0	110	100.0		50	100.0	46	100.0					
4. The Colombian Ministry of Health define as risk group (answer: pregnant women)														
Correct	117	98.3	106	96.4	0.305	48	96.0	45	97.8	0.532	0.7256	0.9796		
Incorrect	2	1.7	4	3.6		2	4.0	1	2.2					
Total	119	100.0	110	100.0		50	100.0	46	100.0					
5. The epidemiological notification of possible pregnant women with Zika should be included in (answer: extreme maternal morbidity)														
Correct	19	16.0	17	15.5	0.531	13	26.0	7	15.2	0.147	0.1921	0.8369		
Incorrect	100	84.0	93	84.5		37	74.0	39	84.8					
Total	119	100.0	110	100.0		50	100.0	46	100.0					

## Funding

This research was supported in part by Universidad Tecnológica de Pereira, Pereira, Risaralda, Colombia.

## Ethical approval

Not required.

## Conflicts of interest

The authors have no conflict of interest to disclose.

## References

- [1] Alfaro-Tolosa P, Clouet-Huerta DE, Rodríguez-Morales AJ. Chikungunya, the emerging migratory rheumatism. *Lancet Infect Dis* 2015;15(5):510–2.
- [2] Rodríguez-Morales AJ. Zika: the new arbovirus threat for Latin America. *J Infect Dev Ctries* 2015;9(6):684–5.
- [3] Sabogal-Roman JA, Murillo-García DR, Yepes-Echeverri MC, Restrepo-Mejía JD, Granados-Álvarez S, Paniz-Mondolfi AE, et al. Healthcare students and workers' knowledge about transmission, epidemiology and symptoms of Zika fever in four cities of Colombia. *Travel Med Infect Dis* 2016;14(1):52–4.
- [4] Rodríguez-Morales AJ. Zika and Microcephaly in Latin America: an emerging threat for pregnant travelers? *Travel Med Infect Dis* 2016;14(1):5–6.
- [5] Kleber de Oliveira W, Cortez-Escalante J, De Oliveira WT, do Carmo GM, Henriques CM, Coelho GE, et al. Increase in reported prevalence of microcephaly in infants born to women living in areas with confirmed Zika virus transmission during the first trimester of pregnancy – Brazil, 2015. *MMWR Morb Mortal Wkly Rep* 2016;65(9):242–7.
- [6] Instituto Nacional de Salud de Bogotá. Zika a semana epidemiológica 13 de 2016. Instituto Nacional de Salud de Bogotá; 2016. <http://www.ins.gov.co/Noticias/ZIKA/Casos%20zika%20por%20municipio%20semana%2010%202016.pdf> [Access date: March 15, 2016].

Mariet Liliana Betancourt-Trejos  
 Carlos Fernando Narváez-Maldonado  
 Wilder Fernando Ortiz-Erazo  
 Juan Sebastián Arias-Guzmán  
 Andrés Felipe Gil-Restrepo  
 Miguel Angel Sánchez-Rueda  
 Néstor Jaime Muñoz-Calle  
 Juan Gabriel Maya-Betancourth  
*Public Health and Infection Research Incubator and Group,  
 Faculty of Health Sciences, Universidad Tecnológica de  
 Pereira, Pereira, Risaralda, Colombia*

Alfonso J. Rodríguez-Morales\*  
*Public Health and Infection Research Incubator and Group,  
 Faculty of Health Sciences, Universidad Tecnológica de  
 Pereira, Pereira, Risaralda, Colombia*

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

*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*

\*Corresponding author. Faculty of Health Sciences, Universidad Tecnológica de Pereira, Pereira, Risaralda, Colombia. Tel.: +57 300 884 7448.  
E-mail address: [arodriguezm@utp.edu.co](mailto:arodriguezm@utp.edu.co) (A.J. Rodríguez-Morales)

24 March 2016