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2. TORCH INFECTIONS IN CHILDBEARING-AGED WOMEN IN CROATIA: PREVALENCE AND PREVENTION

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The TORCH acronym includes the most common etiological agents of infections in pregnant women and newborns: *T. gondii*, rubella virus (RUBV), cytomegalovirus (CMV), herpes simplex viruses (HSV) type 1 and 2, as well as several other viruses: varicella-zoster virus (VZV), parvovirus B19, hepatitis B and C viruses (HBV, HCV), HIV, enteroviruses and bacteria. The "others" category has rapidly expanded, including emerging and re-emerging viral zoonoses. Most of the TORCH infections cause mild maternal morbidity, but have serious consequences on fetal health. In the last two decades, some zoonotic viruses have emerged such as hepatitis E virus (HEV) and Zika virus (ZIKV) which can cause infections in pregnant women and newborns. HEV infection may be more severe during pregnancy with fatal outcome in 15-25% pregnant women. ZIKV infection during pregnancy is associated with severe congenital malformations, including microcephaly. Materno-fetal transmission of re-emerging viruses such as dengue virus (DENV), chikungunya virus (CHIKV) and West Nile virus (WNV) was also reported. DENV infection during pregnancy is associated with higher rate of spontaneous abortion, intrauterine fetal death and premature birth. Congenital dengue fever is caused by the transplacental transmission of the virus during delivery. Most materno-fetal CHIKV transmissions occur during the peripartum period. Congenital WNV infections are possible but very rare; they are associated with malformations, particularly of the brain.

In the period from 2005 to 2015, several studies were conducted at the Croatian National Institute of Public Health to define the seroprevalence of TORCH infections. In childbearing-aged women tested from 2005-2009, the overall IgG seroprevalence rate was found to be 75.3% to CMV, 96.4% to RUBV, 69.4-78.7% to HSV-1, 5.8-10.2% to HSV-2, 63.5% to parvovirus B19 and 83.4% to VZV. Among viral hepatitis markers, HBsAg was detected in 0.5%, anti-HBc in 3.8% and anti-HCV antibodies in 0.5% women. Two pilot studies on the seroprevalence of emerging and re-emerging arboviruses (2011-2015) found seropositivity of 0.38% to DENV and 0.76% to CHIKV. In addition, recently conducted study (2015-2016) on the HEV seroprevalence showed seropositivity of 2.3%. A total of ten asymptomatic pregnant women who returned from endemic areas were tested for ZIKV, DENV and CHIKV during 2016-2017, of whom all were negative.

During the tested period, acute CMV and VZV infections (positive IgM antibodies/low IgG avidity) were confirmed in 0.09% childbearing-aged/pregnant women. HSV-1 and HSV-2 IgM antibodies were found in 1.2% and parvovirus B19 IgM antibodies in 6.9% participants. In 0.36% women, recent asymptomatic WNV infection (positive IgM antibodies/borderline IgG avidity) was confirmed. In addition, imported CHIKV and ZIKV infections were detected in two febrile childbearing-aged women who visited endemic areas. Acute infections caused by other TORCH agents were not detected during the tested period.

Determination of serological status in childbearing-aged women will help to identify seronegative women who are at risk for TORCH infections during pregnancy and help the clinicians to appropriately counsel mothers on preventive measures to avoid these infections. Presented results highlight the importance of surveillance, as well as a need for expanding of TORCH diagnostics including emerging and re-emerging viral zoonoses.