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PALMITOLEATE PROTECTS ZIKA VIRUS INDUCED CASPASE DEPENDENT APOPTOSIS IN NEURONAL CELLS

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Zika virus infection during pregnancy leads to the development of congenital Zika syndrome affecting fetuses and babies. Palmitoleate (PO) is an omega-7 monosaturated fatty acid and the previously published data from our lab shows palmitoleate protects Zika virus induced apoptosis in placental cells. When the ZIKA crosses the blood-brain barrier it leads to severe neuronal damage such as microcephaly. In the present study, we focused on neuronal cells to see whether cell death is caspase-dependent and does the palmitoleate shows a protective effect. Neuroblastoma (SHSY5Y) and glioblastoma (A172) cells were infected with 0.1 and 1 multiplicity of infection (MOI) of r-MRV (a recombinant Ugandan MR766 ZIKA virus strain) for 1 hr. using virus infection media. To confirm caspase-dependent apoptosis, the infection media was removed, and the cells were treated with the media having pan-caspase inhibitor (ZVAD) 50 µM with 10% FBS for 48, 72, and 96 hr. post-infection (hpi.) for SHSY5Y and 72 hpi. for A172 cells. Apoptosis was characterized using biochemical and structural markers such as caspase 3/7 activity (fold change) and changes in nuclear morphology (apoptotic nuclei percentage), respectively. The results show that the 1 MOI r-MRV infection significantly increases the caspase 3/7 activity and apoptotic nuclei %; however, no statistically significant increase in 0.1 MOI infection. The infected cells (1 and 0.1 MOI) treated with ZVAD show significant decrease in apoptosis. To study the PO protective effect, the SHSY5Y cells were infected with 1 MOI and treated with the media having 200 µM PO, 1% BSA, and 10% FBS for 48 hpi. for caspase activity and 72 hpi for apoptotic nuclei %. The results show a significant decrease in apoptosis when the infected cells were treated with 200 µM PO. These findings show r-MRV causes cell death via. caspase dependent apoptosis and PO treatment shows protective effect.