INTERACTION OF DENGUE AND YELLOW FEVER VIRUS WITH MEGAKARYOBLASTS: ROLE IN HEMOSTATIC ALTERATIONS

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Introduction: Dengue Virus (DENV) and Yellow Fever Virus (YFV) have great importance in economy and public health in Africa, South America and Asia. They are the etiologic agents of acute hemorrhagic fevers that are related to hemostasis dysfunction, with coagulation factors consumption and thrombocytopenia. The low platelet count is related to the evolution of the disease severity. Platelets play a crucial role in hemostasis and are cytoplasmic fragments of megakaryocytes. Each megakaryocyte produces from 5,000 to 10,000 platelets. The processes that lead to disease severity evolution have not yet been elucidated.

Aim: To better clarify the processes in which viral infection leads to thrombocytopenia, we aim to study the interaction between DENV and YFV with megakaryocyte precursors.

Material and Methods: We infected MEG-01 cells (Human Megakaryoblastic cell line) with DENV-2 and YFV 17 DD in a multiplicity of infection of 1.

Results and Discussion: We confirmed YFV infection by detecting intracellular YFV proteins since 24h post infection (p.i.) by confocal microscopy. We analyzed the production of infectious particles by plaque assay and observed increasing production until 96h p.i. and followed by decrease. We analyzed cell viability by extracellular activity of LDH and trypan blue exclusion. We observed higher LDH activity from 96h p.i. with YFV but not with DENV-2. A decrease of cell number was evident after 72h p.i. but we only observed an increase of cell mortality from 120h p.i. for both viruses. We observed mitochondrial physiology changes during DENV and YFV infection by measuring oxygen consumption. We also did not observe cell differentiation profile changes from the control.

Conclusion: Our data suggest that YFV can infect and replicate in MEG-01 cells. Our data also suggest that DENV-2 and YFV infections inhibit cell growth until 72h and induce cell death from 120h p.i., with mitochondrial alterations without changing cell differentiation kinetics.

Keywords: Dengue, Yellow Fever, Megakaryocyte, Platelet

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