[PS2.61]

Trypanosoma cruzi induces apoptosis in chorionic villi in an ex vivo infection model of human placenta

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Chagas' disease, one of the major public health concerns in Latin America, is caused by the haemophlagelated protozoan *Trypanosoma cruzi*. In vector related diseases, it is second to malaria in prevalence and mortality (1). In the past few years congenital transmission of *T. cruzi* has become more important, and partly responsible for the "globalization of Chagas' disease" (2), constituting a public health problem of increasing relevance (3).

Diverse pathogens, including *T. cruzi*, are able to cross the placental barrier and infect both the placenta and fetus (4, 5). Parasite invasion in cell cultures has been studied in some depth. On the other hand, studies that analyze parasite invasion in tissues and organs are scarce.

The activation or prevention of cell death seems to be a critical factor in the outcome of an infection since it can facilitate or difficult the pathogen control and spreading. Apoptosis in the hosts can be managed during the infection with microorganisms, such as parasites (6). *T. cruzi* can induce, delay or inhibit apoptosis in host cells (7).

In order to determine induction of apoptosis of the chorionic villi tissue during parasite invasion into placental villi, we incubate explants of human chorionic villi with 10^5 and 10^6 trypomastigotes for 24 hours. Induction of apoptotic cell death was determined by TUNEL analysis, measurement of caspase 3- like activity and immunohistochemical detection of caspase cleaved cytokeratin. Effective infection was tested by inmunohistochemistry (Ac-cruzipain) and PCR. *T. cruzi* induces apoptosis in chorionic villi, evidenced by increase in TUNEL positive cells (Fig 1), caspase 3 like activity (Fig 2) and appearance of cytokeratin 18 neo-epitope (Fig 3). Our results suggest that the induction of apoptosis in chorionic villi helps the parasite to escape from the immune response; alternatively, it could also be a protective mechanism of the placental tissue.

References:

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Key words: Trypanosoma cruzi, mechanism of tissue invasion

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Fig 1

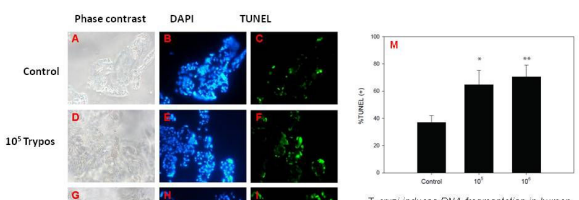
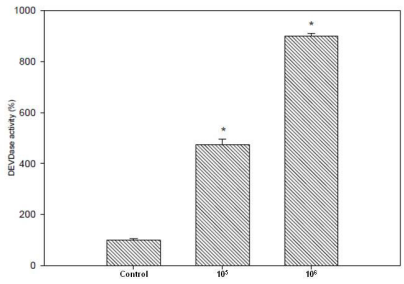


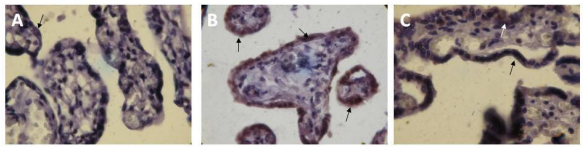
Fig 2



T. cruzi induces caspase-3-like activity in human chorionic villi: Chorionic villi incubated with 10^5 or 10^6 trypomastigotes DM28c strain for 24 hours shows a significant increase in caspase-3-like activity (DEVDase). Results are expressed as a percentage relative to the control chorionic villi caspase-3-like activity. Data are means ± S.E.M. $P<0.01$.

Fig 3

Keywords: Tryp



T. cruzi induces caspase-mediated cleavage of cytokeratin 18: Chorionic villi incubated with 10^5 (B) or 10^6 (C) trypomastigotes DM28c strain for 24 hours were immunostained for cytokeratin 18 neo-epitope, an apoptosis marker for epithelial cells. Chorionic villi incubated with the parasites (B and C) shows a strong immunostaining for cytokeratin 18 neo-epitope (arrows) compared to the control chorionic villi (A). Bar scale: 25 µm.