EV0556
ePoster Viewing
Diagnostic bacteriology – non-culture based, including molecular and MALDI-TOF

The accuracy of combined immune experimental tools to distinguish active tuberculosis from latent infection

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Background: There is still not reliable test to distinguish active tuberculosis (TB) from latent TB infection (LTBI) by an immune test. Recently, the evaluations by cytometry of the amount of cytokine expression ($CD4^+IFN\text{-}\gamma^+TNF\alpha^+$), cell differentiation status ($CD4^+IFN\gamma^+CD45RA^{-/+}CD27^{-/+}$) and the ratio of CD27 within the $CD4^+IFN\gamma^+$ have been shown to be promising experimental tools for active TB identification.

Aim of the study is to evaluate the accuracy to discriminate active TB from LTBI using several immune diagnostic tests based on cytokine response and on the modulation of the effector memory status.

Material/methods: IGRA-positive HIV-uninfected subjects with active TB or LTBI were studied. Whole blood was stimulated with RD1 antigens. Cytokine expression (IFN-γ, IL-2, TNF-α) and differentiation markers were evaluated by cytometry. Logistic Regression analysis was used to model the probability of TB given several immune diagnostic tests. The linear score obtained was used to build the ROC curve. The area under the ROC Curve (AUC) was the parameter chosen to compare different markers combinations; tests for the evaluation of AUC equality were done.

Results: the AUC of the single test varied between 0.83 and 0.91 ($CD4^+IFN\gamma^+TNF\alpha^+$ and $CD4^+IFN\gamma^+CD45RA^-CD27^+$ respectively). Pairwise tests combinations led to an increase of AUC that reached 0.96 (combination of the evaluation of the amount of $CD4^+IFN\text{-}\gamma^+TNF\alpha^+$ cells with $CD4^+$ $IFN\gamma^+$ $CD45RA^-$ $CD27^+$ cells) whereas the combination of the 3 tests together led to an AUC of 0.98.

Conclusions: This study proposes that a combination of several experimental approaches may increase the accuracy to distinguish TB disease from LTBI. This approach needs confirmation in additional studies.