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Impact of CMV infection on soluble markers of myeloid activation in HIV infected subjects

Serena Vita¹, Miriam Lichtner², Giulia Marchetti³, Claudia Mascia⁴, Ester Merlini³, Paola Cicconi³, Vincenzo Vullo⁴, Roberta Piolini⁵, Pierluigi Viale⁶, Alberto Costantini⁷, Cristina Mussini⁸, Antonella d'Arminio Monforte³ for the Icona Foundation Study

¹Sapienza University of Rome, Cenci Bolognetti Foundation ²Sapienza University of Rome, Polo Pontino, Latina, Italy ³San Paolo Hospital, Milan, Italy; ⁴Sapienza University of Rome, Italy; ⁵Sacco Hospital, Milan, Italy; ⁶University of Bologna, ⁷University of Ancona, Clinical Immunology, Ancona; ⁸Clinic of Infectious and Tropical Diseases, University of Modena and Reggio Emilia, Modena, Italy

Background Recently, Cytomegalovirus has been linked to a variety of chronic diseases with an inflammatory component including cardiovascular disease (CVD), cancer, cognitive impairment. In HIV subjects premature aging and degenerative organ diseases are frequent events also during effective ART. CMV coinfection has been proposed as a key factor in sustaining immune activation. In our previous studies on the ICONA cohort we have shown that in HIV patients, CMV infection is an independent risk factor for non AIDS events/deaths. **Aims** To evaluate the role of CMV chronic infection in sustaining increased levels of myeloid soluble markers, of immune activation and inflammatory cytokines in HIV infected subjects on virologically suppressive cART. **Methods** We performed a pilot study to screen all the ICONA patients with an available CMV serology at enrolment (or within 6 months) and a plasma sample after >1 year of successful cART (defined as an undetectable HIV viral load and CD4+ count more than 200/mc). Among these patients 2 different groups have been constituted: CMV-infected and CMV-uninfected patients. CMV chronic infection was defined on CMV IgG presence. Moreover they have been matched 2:1 for the following parameters: age, CD4 nadir, duration of HIV infection, hepatitis virus (HBV and HCV). We have excluded patients with: previous or current CMV organ diseases, organ transplantation, use of immunosuppressive or immunomodulant drugs in the last year, cancer or treatment for cancer in the previous 5 years, insulin dependent diabetes mellitus, glomerular filtration rate < 39 ml/min, severe liver disease, endocrine disorders, autoimmune disease. Plasma sample at the sCD163, sCD14, IL-6, TNF α , were detected using ELISA tests (eBioscience and R&D Systems) on plasma samples selected following the above criteria. Moreover all sample were retested for anti-CMV IgG (GenWay Biotech). Statistical analysis were performed using Mann-Withney Test and Spearman correlation analysis (Prima 6.0 software) **Results** 46 HIV monoinfected and 23 HIV/CMV coinfecting subjects were studied. A higher median level of sCD163 (927.7 vs. 497,8 ng/ml, p=0.018) and sCD14 (1.58 vs. 1.83 μ g/ml, p=0.06) were found in CMV+ compared to CMV- group. No differences in TNF α and IL-6 levels between groups were found. In HIV+CMV+ subjects, a significant correlation was shown between anti-CMV IgG levels and sCD63 (r=0.49, p=0.006), IL-6 (r=0.42, p=0.0041), TNF α (r=0.34, p=0.021). **Conclusions** Our data show that CMV chronic infection appears to be related to an increase in soluble markers of myeloid activation in HIV infected subjects under successful ARV with similar biological (age and sex) and HIV related (HIV suppression, CD4 nadir and CD4 recovery) factors. This persistent activation of monocytes and macrophage that has been associated to cardiovascular and neurological damage in general population, may explain the increased risk of non AIDS events found in CMV/HIV coinfecting subjects.