IMPACT OF MYELOID DERIVED SUPPRESSOR CELLS ON ANTIBODY RESPONSES TO VACCINE STIMULATIONS IN INFANTS

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Background
Vaccination is no news till date, the most successful public health and cost-effective way of combatting infectious diseases that cause morbidity and mortality in children in the first few years of life. Young infants respond poorly to vaccines, but cause of reduced immunity is not clear. We hypothesized that myeloid-derived suppressor cells (MDSC) that might be induced during gestation, would suppress infant's antibody-immune responses.
We evaluated the impact of MDSC on infant-specific antibody responses to Hepatitis B (Hep B), Tetanus toxoid (TT), *Bordetella pertussis* (BP), and *Haemophilus influenzae* type b (Hib) antigens in South African infants.

Methods
In -80^{0}C stored plasma samples, we measured antibody-specific levels of Hep B, TT, BP and Hib responses using ELISA. MDSC frequencies were quantified using multiparameter flow cytometry in whole PBMC.

Results
At birth (n=21), infants had low levels of specific antibodies than at 6 months (n=32) post immunization to Hep B (0.6898 [interquartile range {IQR}, 0-1.175] mIU/mL, vs 16.12 [IQR, 0-62.75] mIU/mL; p=0.0060), TT (0.1138 [IQR, 0.0423-0.2245] IU/mL, vs 1.663 [IQR, 0.9980-2.910] IU/mL; p<0.0001), BP (20.98 [IQR, 12.35-45.19] IU/mL, vs 109.9 [IQR, 87.12-149.6] IU/mL; p<0.0001), Hib (0.2098 [IQR, 0.0305-0.9352] mg/L, vs 2.680 [IQR, 0.8962-6.151] mg/L; p=0.0087). Level of antibodies were significantly higher at 14 weeks (n=32) than at birth to TT (0.1138 [IQR, 0.0423-0.2245] IU/mL, vs 2.142 [IQR, 0.5106-3.303] IU/mL; p<0.0001) and BP (20.98 [IQR, 12.35-45.19] IU/mL, vs 104.0 [IQR, 70.86-133.1] IU/mL; p<0.0001), but not for Hep B and Hib between birth and 14 weeks. At birth, HIV-exposed uninfected (HEU) infants had lower Hib specific antibody levels than unexposed (HU) infants (0.1260 [IQR, 0-0.2923] mg/L, vs 0.6965 [IQR, 0.1340-12.96] mg/L; p=0.0256), but not to other antigens. There was no correlation between specific antibody responses in infants and MDSC frequency measured either at the time at which responses were measured or time at which the first vaccine dose was administered for all the antigens (6 weeks).

Conclusion
Antigen-specific antibody responses increased with time post vaccination as MDSC frequency dropped immediately by 6 weeks after birth reflecting the lack of correlation between antibody responses and MDSC frequency. Therefore, MDSC had little effect on vaccine specific antibody responses.