Despite cells directly seems to be by

Despite the developments in neonatology andimprovements in technology to manage preterm neonates which increased thesurvival of preterm neonates, however, the relative risk of neonatal death ismuch greater for preterm infants than for full-term (1).

Neonatal sepsis andbronchopulmonary dysplasia are the most frequent causes of death in prematurenewborns (2). Theimmune response in preterm infants is affected by prenatal factors including inutero inflammation and maternal characteristics (3, 4). Regulatory Tcells (Tregs) are a population of CD4+ T cells that play an important rolein peripheral tolerance and control of immune responses to pathogens. Theymaking up 5% to 10% of the normal CD4+ T-cell population and characterized bythe expression of the CD25 surface marker and the transcription factor forkheadbox protein 3 (Foxp3) (5). Tregs play a vital role inmaternal–fetal tolerance, and their levels are increased during pregnancy(6, 7).

Tregsparticipate in abrogating immuneresponses and prevent exacerbated and harmful immune activation. However, Tregs may inhibit theantimicrobial immune responsesandlead to ineffective clearance of pathogens resulting in persistent infection 8. Tregs were divided based on their expression of CD45RA. CD4+FoxP3+ CD45RA+ cells were described as naive or resting Tregs, while CD4+FoxP3+CD45RA- cells were regarded as fully functional effector Tregs. CD4+FoxP3+ CD45RA- cells are cytokine-secreting, non-suppressive T cells (9).

Thenaïve subset are de novo generated cells which recently released from thethymus and have not yet experienced antigen exposure 10. Tregs

express several molecules associated with their suppressive function.. About 40 % of the Tregs show surface HLA-DR expression.. HLA-DR+ Tregs expressinduced a more intense and a more rapid T cell suppression than the Tregs thatlack HLA-DR expression 11. Other way for Tregs to suppresseffector T cells directly seems to be by transferring cyclic adenosinemonophosphate (cAMP) into the responder cells 12. cAMP is a potent inhibitorof proliferation, differentiation and IL-2 synthesis in T cells 13.

CD39 isan ectoenzyme that degrades ATP to AMP and may be involved in suppressionmediated by Tregs. CD39 is expressed by all Treg in mice and to a lesser andvariable extent in humans 14. There are Previous studies of the expression ofactivation and memory markers (CD45RO, CD69, HLA-DR, CD25) on total cord bloodCD4+ cells in neonates15, 16 however, there isno studies about the expression of theses markers on cord blood Tregs Thereis little information about immunity in neonates and the capacity of theirimmune systems against infections especially in preterm infants. The immuneresponse of preterm infants is suspected to be immature; however, the data ondifferences in immune capacity between preterm and full-term infants are scant.

The aim of this study was to study Tregs and their expression ofCD45RA, HLA-DR, and CD39 in newborn infants.