

Title of Abstract:

Can Placental Venous Blood (PVB) Be a Reliable Source for Laboratory Evaluation in Neonates At Risk for Early Onset Sepsis?

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Abstract Description:

Background: Many ill newborns are admitted to NICU and treated with antibiotics for presumptive early onset sepsis (EOS). Minimizing blood draws from neonates & the suffering associated with the process is important. The placenta has ample fetal blood that is otherwise discarded; obtaining admission laboratory studies from the PVB may provide a suitable alternative.

Objective: We hypothesized that obtaining CBC, CRP & bacterial blood culture (BCx) from PVB shortly after delivery is feasible & would yield comparable results to studies obtained directly from the neonate.

Study Design: CBC including white blood cell count (WBC), absolute Neutrophils count (ANC), platelets count & immature to total neutrophil ratio (ITR) in addition to CRP & BCx were attempted on 90 paired PVB & admission blood samples from neonates at risk for EOS. Placentas were also examined histologically for chorioamnionitis & funisitis. Risk factors for EOS were collected. Paired t-test & Pearson's correlation were used for data analysis.

Results: Neonatal demographics are detailed in table. Drawing blood from PVB for at least one of the 3 components of the evaluation was successful in all cases. Neonatal WBC, ANC & platelet count all significantly ($p < 0.00011$) correlated with paired PVB samples ($R = 0.84, 0.83, 0.52$). Neonatal WBC & ANC were significantly higher than PVB samples by $\sim 3.2k$ ($p = 0.0005$) & 1637 ($p = 0.007$) respectively. Neonatal Platelet counts were significantly higher than those obtained from PVB by $\sim 34K$ ($p < 0.012$). ITR & CRP were low from both sources (median 0.0 vs 0.05 for ITR & 0.5 vs 0.5 for CRP). Positive BCx were found in 9 of 89 PVB samples compared to 1 of 90

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neonatal samples (10% & 1.1%, respectively). The organisms identified from PVB were: E. coli (2), Streptococcus viridans (2), CONS (3) & mixed (2). The sole positive neonatal BCx was E. coli. Based on clinical course, inflammatory markers (WBC, ITR & CRP), speed of bacterial growth after inoculation (within 15 hours), histological finding of funisitis & consensus among investigators, three (3) of the PVB cultures were considered true positive (rate of 3.3%). The rest of PVB cultures were considered contaminants.

Conclusions: PVB is suitable for obtaining admission CBC as there is a good correlation with neonatal blood. However, it's not suitable as the sole source for obtaining BCx due to significant contamination. PVB may be appropriate as a second source for culturing as it yields additional true positive cultures not recovered by traditional methods.

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