STRONG CHILDREN'S RESEARCH CENTER

Summer Research Scholar

Name: Sarah Fischer

School: University of Rochester

Mentor: Andrew M. Dylag, MD

ABSTRACT

Approximately 93% of extremely low gestational age newborns (born <29weeks) experience respiratory distress, with most requiring mechanical ventilation support while in the NICU[1]. Mechanical ventilation is a life-sustaining procedure; however, it frequently results in lung injury and is correlated with increased incidences of BPD[2]. The mechanism through which ventilation leads to chronic lung disease is poorly understood; making it necessary to further investigate to optimize current treatments and to develop new therapies. Recently, the lung has been found to have a role in platelet production, with estimates that up to 50% of platelets originate from the lung[3]. Infants with BPD have been observed to have lower platelet counts and abnormal platelet volumes[4], and have been found to have high expression of the antiangiogenic protein TSP-1[5] which is highly expressed in platelets. We hypothesize that mechanical ventilation induces TSP-1 expression and increases platelet activation, leading to long-term vascular changes in the lung and BPD.

To investigate the impact of mechanical ventilation on TSP-1 expression and localization, and to determine if these molecular changes occur concurrently with changes in blood cell levels and platelet activation.

Adult transgenic mice (n=3-6 per group) expressing fluorescent tdTomato in all tissues except platelets and megakaryocytes, which express GFP[6] were used. All mice were anesthetized with either ketamine-xylazine or isoflurane, and blood samples were collected by retro-orbital bleeding prior to ventilation. Three mice were assigned to each group, and tracheostomy was performed on experimental mice while a sham procedure was performed on controls. Mice were connected to the flexiVent (SCIREQ, Montréal, QC, CA) and exposed to 30 minutes of slow d*nTf1 0 0 1 72.024 288[M)]TJETQq0.00000912 0 612 792 reW*nBT/F7 11.04 Tf1 0 0 1 142