**EFFECT OF OXYGEN THERAPY in early neotnatal life ON CAPILLARY MICROCIRCULATION and blood pressure IN LOW BIRTH WEIGHT infants**

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**Background:** Low birth weight (LBW) is a risk factor for adult essential hypertension, diabetes mellitus, obesity and cardiovascular disease mortality in later life. Individuals with history of LBW have many abnormalities in their blood vessels including a reduction in microvascular density or rarefaction. Capillary rarefaction (CR) is a hallmark of essential hypertension and evidence suggests that CR is a primary structural abnormality that precedes the onset of the rise in blood pressure as it is found in normotensive individuals at high risk of developing hypertension. We recently found that LBW infants have higher and not lower capillary density at birth. We hypothesized that LBW infants will undergo significant CR in early life triggered or exaggerated by oxygen therapy.

**Methods:** We studied 26 LBW infants and 14 normal birth weight infants (NBW) as controls. Of the LBW infants, only 10 received oxygen therapy. We used a handheld video capillaroscopy system (HVCS) to measure functional or basal (BCD) and structural or maximal capillary density (MCD) on day 1, 5, and 10, and after 40 weeks adjusted for the gestational age in preterm LBW infants. Blood pressure was measured at each visit using Welch Allyn VSMTM 300 monitor.

**Results:** At birth, the NBW infants had significantly lower BCD (mean difference -9.3 cap/area, 95%CI: -1.5 to -17.1, p=0.021) and MCD (mean difference -12.6 cap/area, 95%CI: -1.5 to -21.7, p=0.025) compared to the LBW infants. The LBW oxygen group had a significantly lower SBP (mean difference -9.5mmHg, 95%CI: -1 to -19, p=0.047), DBP (mean difference -13 mmHg, 95%CI: -4 to -22, p=0.009). At 40 weeks old, the LBW oxygen group showed a significant reduction in BCD (mean difference -19.3 cap/area, 95%CI: -9 to -30, p=0.003) and MCD (mean difference -22 cap/area, 95%CI: -8 to -36 p=0.007). Similarly the LBW non-oxygen group had a significant reduction in BCD (mean difference -29 cap/area, 95%CI -17 to -41 p<0.0001) and MCD (mean difference -29 cap/area, 95%CI, -16 to -41 p<0.001). Both LBW groups showed a significant rise in BP. The rise in SBP (mean difference 24 mmHg, 95%CI: 14-34, p<0.0001) and DBP (mean difference 14 mmHg, 95%CI: 7-22, p<0.001) was more pronounced in LBW oxygen group compared to the LBW control group (mean difference 14 mmHg, 95%CI: 0.5-27, p=0.043 and mean difference 9 mmHg, 0.3-19, p=0.056 respectively)

**Conclusions:** We confirm that LBW infants have higher capillary density at birth but develop significant capillary rarefaction and increase in their blood pressure at 40 weeks compared to NBW infants. Oxygen therapy in the neonatal period in LBW infants was associated with higher blood pressure levels but we could not detect any effect on capillary rarefaction. Further studies are needed to investigate the humoral factors that trigger the changes of microcirculation in LBW infants during the neonatal period which may be of importance in preventing hypertension in later life.