BLOOD PRESSURE AND CAPILLARY MICROCIRCULATION AT BIRTH IN INFANTS BORN TO MOTHERS WITH A HYPERTENSIVE DISORDER OF PREGNANCY

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Background Hypertensive disorders of pregnancy (HDP) increase the risk of future cardiovascular disease including hypertension, stroke and diabetes mellitus not only in the affected women but in their offspring as well. Microcirculatory abnormalities and in particular capillary rarefaction (CR) are a hallmark of essential hypertension. We have previously reported that CR is found in individuals with established and borderline hypertension, and in normotensive individuals with a familial predisposition to hypertension. In a previous pilot study, we found that infants born pre-term to mothers with an HDP have significant CR at birth when compared to infants of normotensive mothers.

Methods In this BHF funded research, we studied 110 infants born to mothers with an HDP (87 were born with a normal birth weight (NBW) and 23 had low birth weight (LBW) and compared them to 284 NBW infants born at term to normotensive mothers (control group). We used intravital capillary microscopy to measure basal i.e. functional (BCD) and maximal i.e. structural (MCD) skin capillary densities according to a well-validated protocol. We used the Welch Allyn VSM 300TM monitor to measure the infants’ BP. All infants were studied at birth, 3 months, 6 months and 12 months. We report here the results at birth.

Results Systolic BP was significantly higher in LBW (81.04±9.99 mmHg, p=0.013) and NBW (76.91±11.64 mmHg, p=0.043) infants of HDP mothers compared to infants of normotensive mothers (73.69±10.71 mmHg). There were no significant differences in diastolic BP. Both LBW and NBW infants born to HDP mothers had significantly higher BCD (mean difference of 13.66, 95%CI 6.82 to 20.51 cap/field; p<0.0001) and (mean difference of 5.40, 95%CI 1.72 to 9.08 cap/field; p=0.004) respectively compared to control group. They also had higher MCD (mean difference of 10.32, 95%CI 2.84 to 17.81 cap/field; p=0.007) and (mean difference of 3.87, 95%CI 0.19 to 7.94 cap/field; p=0.062) respectively compared to control group.

Conclusion Infants born to mothers with an HDP have significantly higher systolic BP at birth compared to infants of normotensive mothers. Furthermore, LBW infants of HDP mothers have a significantly higher BCD and MCD compared to NBW of normotensive mothers. Further follow-up studies of these infants are required to investigate the role of the microcirculation in the pathogenesis of essential hypertension.

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