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The Use of Speckle Tracking Echocardiography to Assess Myocardial Performance in Monochorionic Diamniotic Twins with and without Twin to Twin Transfusion Syndrome

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Introduction: Data on myocardial performance in monochorionic diamniotic (MCDA) twins during the early neonatal period is lacking. These infants are at risk of developing twin to twin transfusion syndrome (TTTS). We aimed to assess myocardial function using speckle tracking echocardiography (STE) in MCDA twins with and without TTTS. We hypothesise that infants exposed to TTTS would exhibit lower values for strain and strain rate measured using (STE) during the early neonatal period.

Methods: We performed a prospective observational study of 4 twin groups: Uncomplicated MCDA, MCDA twins with selective IUGR, MCDA with TTTS in receipt of SLPCV (MCDA & LASER) and MCDA twins with TTTS not receiving SLPCV (MCDA no LASER). Serial echocardiography was performed on day one, day two and between days 5 – 7 of life. Assessment of myocardial performance included the use of STE.

Results: Forty seven twin pairs were enrolled in the study: 21 uncomplicated MCDA; 14 selective IUGR; 6 TTTS no LASER, and 6 TTTS & LASER. Recipient TTTS no LASER infants had lower LV and RV strain (which persisted throughout the first week. Function measurements in the TTTS no LASER donor group were significantly higher than the recipient counterparts.

Conclusion: This is the first study using STE to highlight the poor myocardial performance in MCDA twins exposed to TTTS who do not undergo SLPCV. This highlights the need for close monitoring of their haemodynamic status during the early neonatal period. Further study is warranted to explore this condition further.