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Background

In Singleton Pregnancies

- ✓ Fetal growth restriction (FGR) occurs due to a consequence of failure of trophoblastic invasion of the maternal spiral arteries resulting in impaired placentation.
- ✓ Pregnancies with FGR & impaired placentation are associated with an increased risk of adverse perinatal effects.

Uterine Artery Pulsatility Index Assessment

- ✓ A reliable and noninvasive method of assessing uteroplacental circulation.
- ✓ In singletons, a high UtA – PI is indicative of uteroplacental insufficiency which is positively correlated with adverse perinatal outcomes.
- ✓ High UtA-PI may be useful in the prediction of adverse perinatal outcomes in singletons with FGR.

Twin Pregnancies

- ✓ Twin pregnancies have a higher incidence of pre-eclampsia and perinatal mortality linked to FGR.
 - ✓ Limited studies on the use of doppler ultrasound for the prediction of adverse effects in twin pregnancies.
- Can we use the Uterine PI doppler to assess for Adverse perinatal outcomes in twins?**

Research Objectives

1. This study aims to investigate the significance of using uterine artery doppler in DCDA twins with and without fetal growth restriction.
2. This study also evaluates predictive nature of uterine artery doppler assessment for adverse perinatal outcomes in twins with fetal growth restriction.

Methods

733 Dichorionic twin pregnancies from 1998 - 2019 were identified via electronic case records and mean UtA – PI was identified and extracted via excel spreadsheets. They were then converted into percentiles for comparison using DCDA twin specific reference charts. Abnormal uterine artery doppler was defined as mean uterine artery pulsatility index > 95th percentile.

The mean uterine artery PI was then compared between the cases (twins with FGR) and controls (twins with normal growth) to assess for any significant differences.

In twins with FGR, data was extracted on adverse perinatal outcomes. The mean uterine PI value was then compared within the cases and a difference between those who had adverse perinatal outcomes and those who did not was looked for. Adverse perinatal outcomes within the cases were defined as NNU Admission, respiratory distress syndrome and twin death.

The patients age, ethnicity, mode of conception, gestational age of delivery and mode of delivery were all also identified within the cases.

Discussion

This study has concluded that within the data studied, there was no statistically significant difference in the UTA PI between DCDA twins with FGR and without. Additionally, when assessing adverse perinatal outcomes in DCDA twins with FGR, there was also no statistical significance in the UTA PI between those with adverse outcomes to those with normal outcomes.

Despite the fact the data extracted for this study was from a wide range of years, the sample size of the cases (89) was an apparent limitation when analysing the data. Additional limitations include the demographics of the cases being quite limited with most cases being from a white ethnic background. This is quite significant due to numerous literature highlighting the higher incidence of adverse outcomes in BAME individuals. A wider range of adverse outcomes can also be considered in future studies.

It would also crucial to consider the time of FGR diagnosis and asses whether the time diagnosed has an impact in the uterine PI values when assessing it for adverse perinatal outcomes.

Next Steps

Recruiting a Larger Sample Size of Cases

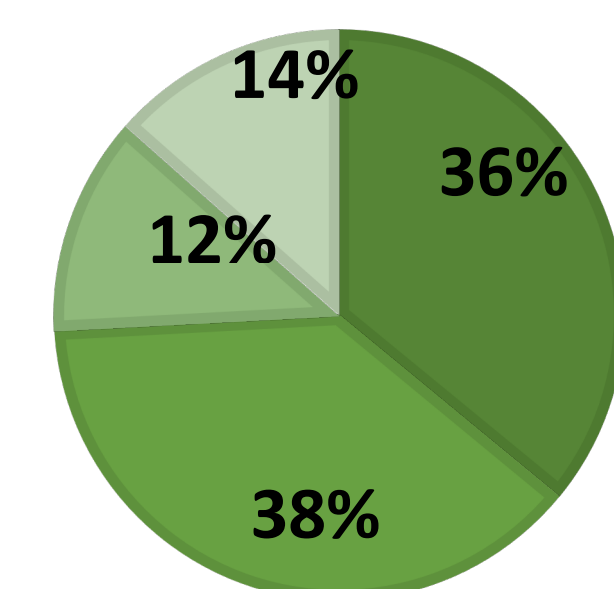
Including a larger number of cases from BAME backgrounds

Assessing the impact of FGR time of diagnosis and Adverse outcomes

Results

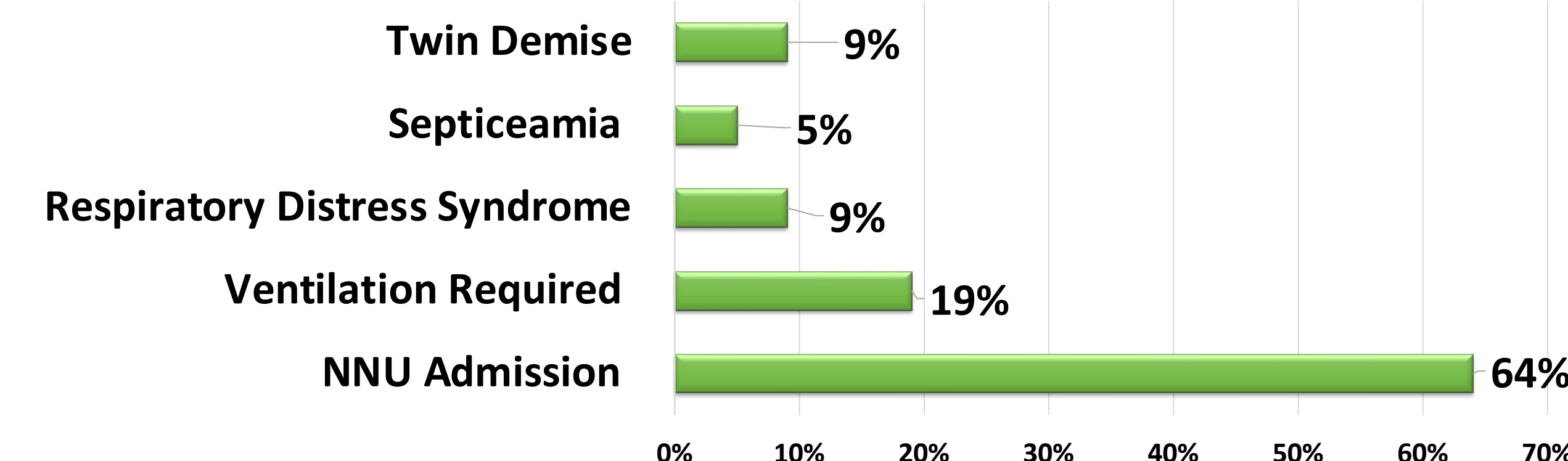
Maternal Demographic	Mean	Standard Deviation
Gestational Age Delivery	33.7 weeks	2.81
Age of Mother	33.7 years	5.46

MODE OF DELIVERY



- Emergency Caesarean
- Elective Caesarean
- Vaginal Delivery

Postnatal Outcomes



89 DCDA twins with FGR (cases) and 643 dichorionic twins with normal growth (controls) were included in the study. When comparing the mean UtA – PI values between normal growth and growth restricted fetuses, no statistically significant differences were observed (0.84 vs 0.87, p=0.772). Additionally, focusing on the twins with fetal growth restriction, the mean UtA – PI values was not significantly different between those who had composite adverse outcomes compared to those who did not have any adverse outcomes (0.81 vs 0.90, p=0.823). Hence, we can conclude that mean UtA – PI values was not a good predictor of adverse outcomes in growth restricted twin pregnancies (AUC: 0.60, 95% CI: 0.51 – 0.68).

The figures shown above highlight the mode of delivery between the cases, additionally the mean and median gestational age of delivery (weeks) and the mean and median parent age (years) are also presented. Further highlighted within the cases are the percentages of fetuses that required ventilation post birth, had respiratory distress syndrome, required NNU admission and the percentage of fetuses that did not survive.

References

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