UKOSS
UK Obstetric Surveillance System

1. Title

UKOSS Single intrauterine fetal death in monochorionic twins study: incidence; maternal, fetal and neonatal consequences. (Single twin demise in monochorionic twins)

2. Key points

- Monochorionic (MC) twins constitute 20-30% of all twin pregnancies and 2.6-6.2% will have a single intrauterine fetal death.
- This event is associated with increased risk of premature delivery and perinatal mortality and morbidity for the other twin.
- There is a lack of robust data regarding the incidence of single twin demise; interventions offered; maternal, fetal and neonatal outcomes and any prognostic indicators.
- The knowledge gained from this study will enable recommendations for the management of monochorionic twin pregnancies following single twin demise and improve the counselling and management.

3. Surveillance Period

1st June 2016 – 31st May 2017

4. Background

Perinatal mortality is increased in multiple compared to singleton pregnancies, with single twin demise presenting a rare but unique perinatal problem with reported incidence of single twin demise after 14 weeks between 2.6 to 6.2 percent of all twin pregnancies[1]. Fetal morbid sequelae may include prematurity, death of the surviving fetus or survival with perinatal morbidity[2]. In addition, maternal morbidity has been reported as increased with higher (than background) rates of pre-eclampsia, coagulopathy and sepsis[3,4]. Management of pregnancies complicated by intrauterine death in a twin may be challenging as controversy exists regarding the optimal time of delivery, the frequency of antenatal surveillance, the appropriate investigations to determine cerebral impairment and the effects on maternal wellbeing (both physical and psychological) of retaining one dead fetus. Current evidence is limited by small numbers and significant heterogeneity in terms of diagnosis, investigation, management and post-natal follow-up (Appendix 1).

5. Objective

To use the UK Obstetric Surveillance System (UKOSS) to determine the incidence of single twin demise in MC twin pregnancies and the adverse maternal, fetal and neonatal outcomes.

6. Research questions

- What is the incidence of single twin demise in the UK?
- What are the characteristics of pregnancies affected by single twin demise (maternal
- demographics, gestation, suspected aetiology)?
- What is the nature and incidence of antenatal intervention following single twin demise?
- What are the maternal, fetal and neonatal outcomes following single twin demise?
- Are there prognostic indicators associated with single twin demise? E.g. maternal age

7. Case definition

All women in the UK with a monochorionic twin pregnancy with single twin demise after 14 weeks gestation, defined as:

a) **Monochorionic twin pregnancy** – chorionicity confirmed at first trimester scan (<14 weeks) due to ultrasonic absence of the lambda sign (an echogenic V-shaped chorionic projection of tissue in dichorionic placentation)7.

b) **Single intrauterine fetal death** – intrauterine death of one twin after 14 weeks of gestation (including spontaneous single twin demise or selective feticide).

8. Funding and costs

This study is being funded by the British Maternal Fetal Medicine Society (BMFMS) and Twins and Multiple Births Association (TAMBA) (Appendix 3). The cost of the UKOSS study is £15,000 payable to the University of Oxford in quarterly instalments from commencement of data collection. A further £5000 will be used to pay for the statistical analysis at the end of data collection.

9. Ethics committee approval

This study has been approved by the North London REC1 (REC Ref. Number: 10/H0717/20) (Appendix 4).

10. Lead Investigator

Professor Mark Kilby, Dr Katie Morris, University of Birmingham; Professor Marian Knight NPEU.

11. Timetable and progress

May 2015 – application to UKOSS TSC– awarded (Appendix 2)

January 2016 – awarded BMFMS TAMBA Bursary (Appendix 3)

April 2016 – ethics amendment approved (Appendix 4)

April – May 2016 Protocol and Data collection form prepared (Appendix 5 and 6)

July 2016-July 2017 – Case identification and data collection

July 2017- December 2017 – Completion of data collection and analysis of data

January 2018 – March 2018 – Analysis, write-up and dissemination of results.

After 9 months of reporting we have 66 confirmed cases reported and have received data collection forms (DCF) for 38 of these. The delay in receiving the DCFs is either because the pregnancy is ongoing or due to a delay in chasing outstanding forms due to a move to a different electronic system at NPEU which is now resolved.

We are in the process of applying to Health Quality Improvement Partnership to access data via MBRRACE to ensure full case ascertainment as we recognise that the numbers of cases reported are lower than anticipated.

12. Additional documents to be submitted

Appendix 1 Powerpoint presentation of figures and tables entitled "Appendix_1 UK Obstetric Surveillance System Single twin demise study".

Appendix 2 Collaborator agreement University of Oxford (NPEU) and University of Birmingham

Appendix 3 Award letter for funding

Appendix 4 Ethics approval

Appendix 5 Protocol

Appendix 6 Data Collection form

13. References

1. Pharoah PO & Adi Y. Lancet 2000;355:1597-602.

2. Hillman SC et al. Obstet Gynecol. 2011;118(4):928-40.

3. Santema JG et al. Br J Obstet Gynaecol 1995;102:26-30.

4. Kilby MD et al. Obstet Gynecol. 1994;84(1):107-110.

Signed:

Professor Mark Kilby 20/6/2017 Dr Katie Morris 20/6/2017