FERN: Intervention or Expectant Management for Early Onset Selective Fetal Growth Restriction in Monochorionic Twin Pregnancy

The FERN study is a multicentre study to determine if it is feasible to conduct a randomised control trial (RCT) of active intervention versus expectant management in monochorionic (MC) twin pregnancies with early-onset (prior to 24 weeks) selective fetal growth restriction (sFGR).

This survey focuses on the management of monochorionic (MC) twin pregnancies complicated by selective fetal growth restriction (sFGR). The overall aim is to establish the current management approaches offered to women with MC twin pregnancies complicated by early onset (less than 24 weeks) sFGR. More specifically, we wish to know what affects the decision to offer expectant care or active fetal intervention in cases of sFGR diagnosed before 24 weeks.

The survey is aimed at specialists involved in the diagnosis and management of twin pregnancies. Please give your personal management preferences.

The survey is voluntary, and you can exit at any point without completing it. By continuing you agree that your opinion will be used for research purposes to include:

Agreeing to data collection, storage, and the use of your (personal) data for answering the research question of this project. Data will be stored for 15 years. Data will be coded and analysed using pseudonyms. Personal data will be stored separately from the data analysis. No personal data will be provided in any publication UNLESS you wish to be mentioned in the acknowledgements. Consent for this will be requested in a separate form.
Thank you for taking part in this survey and please pass onto any other individuals with appropriate experience for their contribution.

On behalf of the FERN Study:
Asma Khalil, Andrew Sharp, Jamie Kirkham, Smriti Prasad, Kerry Woolfall, Zarko Alfirevic, Ahmet A Baschat, Jan Deprest, Liesbeth Lewi, Kurt Hecher, E Lopriore and the FERN Collaborative Group

Questions

Q1) Which of the following job titles best describes your current position?	◯ Fetal Medicine Specialist ◯ Fetal Therapy Specialist ◯ Consultant Obstetrician ◯ Obstetrician - In training (any level) ◯ Sonographer ◯ Neonatologist ◯ Other
Please specify:	_____
Q2) Where are you currently practicing?	◯ United Kingdom ◯ Europe ◯ International

Please specify:

- ◯ Albania
- ◯ Andorra
- ◯ Armenia
- ◯ Austria
- ◯ Azerbaijan
- ◯ Belarus
- ◯ Belgium
- ◯ Bosnia and Herzegovina
- ◯ Bulgaria
- ◯ Croatia
- ◯ Cyprus
- ◯ Czechia
- ◯ Denmark
- ◯ Estonia
- ◯ Finland
- ◯ France
- ◯ Georgia
- ◯ Germany
- ◯ Greece
- ◯ Hungary
- ◯ Iceland
- ◯ Ireland
- ◯ Italy
- ◯ Kazakhstan
- ◯ Kosovo
- ◯ Latvia
- ◯ Liechtenstein
- ◯ Lithuania
- ◯ Luxembourg
- ◯ Malta
- ◯ Moldova
- ◯ Monaco
- ◯ Montenegro
- ◯ Netherlands
- ◯ North Macedonia
- ◯ Norway
- ◯ Poland
- ◯ Portugal
- ◯ Romania
- ◯ Russia
- ◯ San Marino
- ◯ Serbia
- ◯ Slovakia
- ◯ Slovenia
- ◯ Spain
- ◯ Sweden
- ◯ Switzerland
- ◯ Turkey
- ◯ Ukraine
- ◯ Vatican City (Holy See)

Please specify:

- ◯ Africa
- ◯ Asia
- ◯ Australia
- ◯ North America
- ◯ South America

Q3) What type of centre/place of work are you currently practising in?

- ◯ Fetal medicine centre >50 MC twin pregnancies per year
- ◯ Fetal medicine centre between 20 and 50 MC twin pregnancies per year
- ◯ Fetal medicine centre < 20 MC twin pregnancies per year
- ◯ Other

Please specify: _____

Q4) Which of the following services do you routinely offer where you work?

- ◯ Fetal therapy in twin pregnancies
- ◯ Prenatal diagnosis (including twin pregnancies), but not fetal therapy
- ◯ Prenatal screening (including twin pregnancies), but not diagnosis
- ◯ Other

Please specify: _____

Q5) Which of the following diagnostic criteria do you use for sFGR in MC twins? (tick all that apply)

- ☐ EFW < 10th centile of the smaller twin + intertwin EFW discordance ≥25%
- ☐ EFW < 10th centile of the smaller twin + intertwin EFW discordance ≥20%
- ☐ EFW < 10th centile of the smaller twin
- ☐ EFW < 3rd centile of the smaller twin + intertwin EFW discordance ≥25%
- ☐ EFW < 3rd centile of the smaller twin + intertwin EFW discordance ≥20%
- ☐ EFW < 3rd centile of the smaller twin
- ☐ EFW < 5th centile of the smaller twin + intertwin EFW discordance ≥25%
- ☐ EFW < 5th centile of the smaller twin + intertwin EFW discordance ≥20%
- ☐ EFW < 5th centile of the smaller twin
- ☐ AC < 10th centile of the smaller twin + intertwin EFW discordance ≥25%
- ☐ AC < 10th centile of the smaller twin + intertwin EFW discordance ≥20%
- ☐ Other

Please specify: _____

Q6) Approximately how many cases of sFGR in MC twins do you see or manage in one year?

- ◯ < 5
- ◯ 5-10
- ◯ 11-15
- ◯ 16-20
- ◯ 21-25
- ◯ 26-30
- ◯ >30
- ◯ Other

Please specify: _____

Q7) Approximately how many cases of early-onset sFGR (diagnosed before 24 weeks) in MC twins do you see or manage in one year?

- ◯ < 5
- ◯ 5-10
- ◯ 11-15
- ◯ 16-20
- ◯ 21-25
- ◯ 26-30
- ◯ >30
- ◯ Other

Please specify: _____

Type 1 sFGR (positive EDF in the umbilical artery Doppler)

Q8) Approximately how many cases of type 1 (positive EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins do you see or manage in one year

- ◯ < 5
- ◯ 5-10
- ◯ 11-15
- ◯ 16-20
- ◯ 21-25
- ◯ 26-30
- ◯ >30
- ◯ Other

Please specify: _____

Q9) Approximately how many cases of type 1 (positive EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins do you see or manage in one year?

- ◯ < 5
- ◯ 5-10
- ◯ 11-15
- ◯ 16-20
- ◯ 21-25
- ◯ 26-30
- ◯ >30
- ◯ Other

Please specify: _____

Q10) How do you routinely manage early onset type 1 (positive EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins?

- ◯ Expectant management
- ◯ Offer fetal intervention
- ◯ Refer to fetal intervention centre
- ◯ Other

Please specify: _____

Q11) How do you routinely manage late onset type 1 (positive EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins?

- ◯ Expectant management
- ◯ Offer fetal intervention
- ◯ Refer to fetal intervention centre
- ◯ Other

Please specify: _____

Q12) When managing early onset type 1 (positive EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins, which of the following ultrasound parameters do you routinely record? (tick all that apply)

- ☐ Fetal biometry
- ☐ Umbilical artery
- ☐ Middle cerebral artery
- ☐ Ductus venosus
- ☐ Liquor volume
- ☐ Placental position
- ☐ Other

Please specify: _____

Q13) When managing late onset type 1 (positive EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins, which of the following ultrasound parameters do you routinely record? (tick all that apply)

- ☐ Fetal biometry
- ☐ Umbilical artery
- ☐ Middle cerebral artery
- ☐ Ductus venosus
- ☐ Liquor volume
- ☐ Placental position
- ☐ Other

Please specify:

_____

Q14) When you consider the option of active fetal intervention for early onset type 1 (positive EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins, which of the following options would you recommend?

- ◯ Fetoscopic Laser photocoagulation
- ◯ Selective feticide of the smaller twin
- ◯ Fetoscopic Laser photocoagulation or selective feticide of the smaller twin
- ◯ I would not offer active fetal intervention
- ◯ Other

Please specify:

_____

Q15) When you consider the option of active fetal intervention for late onset type 1 (positive EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins, which of the following options would you recommend?

- ◯ Fetoscopic Laser photocoagulation
- ◯ Selective feticide of the smaller twin
- ◯ Fetoscopic Laser photocoagulation or selective feticide of the smaller twin
- ◯ I would not offer active fetal intervention
- ◯ Other

Please specify:

_____

Q16) What is the frequency of follow up or ultrasound for early onset type 1 (positive EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins

- ◯ Daily
- ◯ Twice weekly
- ◯ Weekly
- ◯ 2 weeks
- ◯ 3 weeks
- ◯ Other

Please specify:

_____

17) What is the frequency of follow up or ultrasound for late onset type 1 (positive EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins?

- ◯ Daily
- ◯ Twice weekly
- ◯ Weekly
- ◯ 2 weeks
- ◯ 3 weeks
- ◯ Other

Please specify:

_____

18) What gestational age would you plan delivery for type 1 (positive EDF in the umbilical artery Doppler) sFGR in MC twins?

- ◯ 26-27 weeks
- ◯ 28-29 weeks
- ◯ 30-31weeks
- ◯ 32-33 weeks
- ◯ 34-36 weeks
- ◯ Other

Please specify: _____

Type 2 (absent or reversed EDF in the umbilical artery Doppler)

19) Approximately how many cases of type 2 (absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins do you see or manage in one year?

- ◯ < 5
- ◯ 5-10
- ◯ 11-15
- ◯ 16-20
- ◯ 21-25
- ◯ 26-30
- ◯ >30
- ◯ Other

Please specify: _____

20) Approximately how many cases of type 2 (absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins do you see or manage in one year?

- ◯ < 5
- ◯ 5-10
- ◯ 11-15
- ◯ 16-20
- ◯ 21-25
- ◯ 26-30
- ◯ >30
- ◯ Other

Please specify: _____

21) How do you routinely manage early onset type 2 (absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins?

- ◯ Expectant management
- ◯ Offer fetal intervention
- ◯ Refer to fetal intervention centre
- ◯ Other

Please specify: _____

22) How do you routinely manage late onset type 2 (absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins?

- ◯ Expectant management
- ◯ Offer fetal intervention
- ◯ Refer to fetal intervention centre
- ◯ Other

Please specify: _____

23) When managing early onset type 2 (absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins, which of the following ultrasound parameters do you routinely record? (tick all that apply)

- ☐ Fetal biometry
- ☐ Umbilical artery
- ☐ Middle cerebral artery
- ☐ Ductus venosus
- ☐ Liquor volume
- ☐ Placental position
- ☐ Other

Please specify: _____

24) When managing late onset type 2 (absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins, which of the following ultrasound parameters do you routinely record? (tick all that apply)

- ☐ Fetal biometry
- ☐ Umbilical artery
- ☐ Middle cerebral artery
- ☐ Ductus venosus
- ☐ Liquor volume
- ☐ Placental position
- ☐ Other

Please specify:

_____

25) When you consider the option of active fetal intervention for early onset type 2 (absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins, which of the following options would you recommend?

- ◯ Fetoscopic Laser photocoagulation
- ◯ Selective feticide of the smaller twin
- ◯ Fetoscopic Laser photocoagulation or selective feticide of the smaller twin
- ◯ I would not offer active fetal intervention
- ◯ Other

Please specify:

_____

26) When you consider the option of active fetal intervention for late onset type 2 (absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins, which of the following options would you recommend?

- ◯ Fetoscopic Laser photocoagulation
- ◯ Selective feticide of the smaller twin
- ◯ Fetoscopic Laser photocoagulation or selective feticide of the smaller twin
- ◯ I would not offer active fetal intervention
- ◯ Other

Please specify:

_____

27) What is the frequency of follow up or ultrasound for early onset type 2 (absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins?

- ◯ Daily
- ◯ Twice weekly
- ◯ Weekly
- ◯ 2 weeks
- ◯ 3 weeks
- ◯ Other

Please specify:

_____

28) What is the frequency of follow up or ultrasound for late onset type 2 (absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins?

- ◯ Daily
- ◯ Twice weekly
- ◯ Weekly
- ◯ 2 weeks
- ◯ 3 weeks
- ◯ Other

Please specify:

_____

29) What gestational age would you plan delivery for type 2 (absent or reversed EDF in the umbilical artery Doppler) sFGR in MC twins?

- ◯ 26-27 weeks
- ◯ 28-29 weeks
- ◯ 30-31weeks
- ◯ 32-33 weeks
- ◯ 34-36 weeks
- ◯ Other

Please specify: _____

Type 3 (intermittent absent or reversed EDF in the umbilical artery Doppler)

30) Approximately how many cases of type 3 (intermittent absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins do you see or manage in one year?

- ◯ < 5
- ◯ 5-10
- ◯ 11-15
- ◯ 16-20
- ◯ 21-25
- ◯ 26-30
- ◯ >30
- ◯ Other

Please specify: _____

31) Approximately how many cases of type 3 (intermittent absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins do you see or manage in one year?

- ◯ < 5
- ◯ 5-10
- ◯ 11-15
- ◯ 16-20
- ◯ 21-25
- ◯ 26-30
- ◯ >30
- ◯ Other

Please specify: _____

32) How do you routinely manage early onset type 3 (intermittent absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins?

- ◯ Expectant management
- ◯ Offer fetal intervention
- ◯ Refer to fetal intervention centre
- ◯ Other

Please specify: _____

33) How do you routinely manage late onset type 3 (intermittent absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins?

- ◯ Expectant management
- ◯ Offer fetal intervention
- ◯ Refer to fetal intervention centre
- ◯ Other

Please specify: _____

34) When managing early onset type 3 (intermittent absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins, which of the following ultrasound parameters do you routinely record? (tick all that apply)

- ☐ Fetal biometry
- ☐ Umbilical artery
- ☐ Middle cerebral artery
- ☐ Ductus venosus
- ☐ Liquor volume
- ☐ Placental position
- ☐ Other

Please specify: _____

35) When managing late onset type 3 (intermittent absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins, which of the following ultrasound parameters do you routinely record? (tick all that apply)

- ☐ Fetal biometry
- ☐ Umbilical artery
- ☐ Middle cerebral artery
- ☐ Ductus venosus
- ☐ Liquor volume
- ☐ Placental position
- ☐ Other

Please specify:

_____

36) When you consider the option of active fetal intervention for early onset type 3 (intermittent absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins, which of the following options would you recommend?

- ◯ Fetoscopic Laser photocoagulation
- ◯ Selective feticide of the smaller twin
- ◯ Fetoscopic Laser photocoagulation or selective feticide of the smaller twin
- ◯ I would not offer active fetal intervention
- ◯ Other

Please specify:

_____

37) When you consider the option of active fetal intervention for late onset type 3 (intermittent absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins, which of the following options would you recommend?

- ◯ Fetoscopic Laser photocoagulation
- ◯ Selective feticide of the smaller twin
- ◯ Fetoscopic Laser photocoagulation or selective feticide of the smaller twin
- ◯ I would not offer active fetal intervention
- ◯ Other

Please specify:

_____

38) What is the frequency of follow up or ultrasound for early onset type 3 (intermittent absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed before 24 weeks in MC twins?

- ◯ Daily
- ◯ Twice weekly
- ◯ Weekly
- ◯ 2 weeks
- ◯ 3 weeks
- ◯ Other

Please specify:

_____

39) What is the frequency of follow up or ultrasound for late onset type 3 (intermittent absent or reversed EDF in the umbilical artery Doppler) sFGR diagnosed after 24 weeks in MC twins?

- ◯ Daily
- ◯ Twice weekly
- ◯ Weekly
- ◯ 2 weeks
- ◯ 3 weeks
- ◯ Other

Please specify:

_____

40) What gestational age would you plan delivery for type 3 (intermittent absent or reversed EDF in the umbilical artery Doppler) sFGR in MC twins?

- ◯ 26-27 weeks
- ◯ 28-29 weeks
- ◯ 30-31weeks
- ◯ 32-33 weeks
- ◯ 34-36 weeks
- ◯ Other

Thank you for completing this questionnaire.

The next part of the FERN study will involve interviews and focus groups to explore acceptability and feasibility of conducting a randomised controlled trial (RCT) of active intervention versus expectant management in monochorionic (MC) twin pregnancies with early-onset (prior to 24 weeks) selective fetal growth Restriction (sFGR).

If you would be interested in taking part in an interview or focus group please add your contact details below and the study team will send you further information. Your details will not be used for any other purpose.

Name: _____

Email address: _____

You may be aware that from 25th May 2018, the law changed regarding how we can handle your personal information.

To give you assurance that we have dealt with these changes appropriately, you can find out more about how we use your information at https://www.liverpool.ac.uk/legal/data_protection/