Supplementary Material

## Supplementary Table 1. Diagnostic and pregnancy outcomes for the study cohort (n=109).

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **RAA (n)** | ***With outcome* | lost to f/u** | **Diagnostic testing** | **Fetal testing** | **Placental testing** | **Confirmed in fetus** | **Confirmed in placenta** | **Diagnostic testing details** | **With obstetric outcome** | **Normal Livebirth/Neonate** | **Pregnancy complicat-ions** | **PE** | **Preterm birth** | **Abnormal newborn exam** | **Pregnancy loss or stillbirth** | **FGR** | **SA** | **TAB**  |
| T2 (3) | ***2*** | 1 | 2 | 2/2 | 0/2 | 0/2 | ----- | AF-Array (1)AF-FISH and array (1) | 2 | 1 | 1A | 0 | 1A | 0 | 0 | 1A | 0 | 0 |
| T3 (3) | ***3*** | 0 | 3 | 3/3 | 0/3 | 0/3 | ----- | AF-Array (2)AF-qfPCR, Karyo, aCGH (1) | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| T4 (3) | ***3*** | 0 | 3 | 3/3 | 0/3 | 0/3 | ----- | AF-Array (3) | 3 | 1 | 2B,C | 0 | 2B,C | 0 | 0 | 1C | 0 | 0 |
| T5 (1) | ***1*** | 0 | 1 | 1/1 | 0/1 | 0/1 | ----- | AF-Karyo (1) | 1 | 0 | 1D | 0 | 1D | 0 | 0 | 1D | 1D | 0 |
| T6 (2) | ***1*** | 1 | 0 | ----- | ----- | ----- | ----- | ----- | 1 | 1 | UnknownE | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| T7 (20) | ***19*** | 1 | 16 | 15/16 | 1/16 | 1/15 | 0/1 | CVS-qfPCR + Karyo (1)AF-qfPCR (1)AF-Karyo (1) AF-Array (5) AF - Array + UPD (4) AF - FISH + UPD (1)AF - FISH, Karyo, aCGH, UPD (1)NBB-Array + UPD (1) UC + CB-Array + UPD (1) | 18 | 8F | 10G,H,I,J,K,L,M,N,O,P | 0 | 4I,J,K,L | 0 | 1M | 2I,K | 1N | 3N,O,P |
| T8 (10) | ***10*** | 0 | 9 | 9/9 | 1/9 | 0/9 | 1/1 | AF-Karyo (1)AF-Array (6)NBB-Array (1)UC-FISH + Array + Postnatal placenta - FISH (1)  | 9 | 7Q | 2R,S | 0 | 1R | 0 | 0 | 1R | 1S | 1S |
| T9 (3) | ***2***| 1 | 1 | 1/1 | 0/1 | 0/1 | ----- | AF-Array (1) | 2 | 1 | 1T | 0 | 0 | 0 | 1T | 0 | 0 | 0 |
| T10 (4) | ***4*** | 0 | 4 | 3/4 | 1/4 | 1/3 | 1/1 | AF-Karyo (1)AF-Array (1) AF-FISH, qfPCR, Array (1)CVS-Array (1) | 1 | 0 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1U |
| T11 (1) | ***0*** | 1 | 0 | ----- | ----- | ----- | ----- | ----- | 0 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| T14 (4) | ***4*** | 0 | 4 | 4/4 | 0/4 | 1/4 | ----- | AF-Karyo (2)AF-Karyo + UPD (1)POC-Karyo (1) | 3 | 2 | 1V | 0 | 0 | 0 | 1V | 0 | 0 | 0 |
| T15 (13) | ***12*** | 1 | 8 | 8/8 | 1/8 | 1/8 | 1/1 | AF-Karyo (3)AF-Array (1)AF-FISH + UPD (1)AF-Array + UPD (2)AF -FISH + Array + UPD + POC-CV + UC-Array (1) | 10 | 4W | 6X,Y,Z,AA | 0 | 0 | 1X | 3Y | 2X,Z | 0 | 2X, AA |
| T16 (14) | ***12*** | 2 | 8 | 8/8 | 2/8 | 4/8 | 2/2 | AF-Array (3)AF-Array + UPD (1)AF-FISH +Array (1)Postnatal placenta + UC + CV -NGS (1)NBB-Array + UPD (1)NBB-karyo + FISH + postnatal placenta-array (1) | 10 | 2BB,CC | 8DD,EE,FF,GG,HH,II,JJ | 3DD,EE,FF | 5DD,EE,FF,GG,HH | 0 | 2II | 1HH | 0 | 1JJ |
| M18 (1) | ***1*** | 0 | 1 | 1/1 | 1/1 | 0/1 | 0/1 | AF-Karyo + postnatal placenta (1) | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| T20 (10) | ***10*** | 0 | 9 | 9/9 | 1/9 | 1/9 | 0/1 | AF-Karyo (3)AF-Array (2) AF-Array + FISH + POC umbilical cord (1)AF-Array + UPD (1)AF-Unspecified (1) AF-Karyo + Postnatal placenta-Karyo (1) | 9 | 4 | 5KK,LL,MM,NN,OO | 1KK | 2LL,MM | 1NN | 1OO | 1LL | 1NN | 1NN |
| T22 (17) | ***13*** | 4 | 5 | 5/5 | 0/5 | 1/5 | ----- | AF-FISH (1)AF-Karyo (1)AF-Array (1) AF-FISH + Array (1) POC-Array (1) | 13 | 4PP.QQ | 9 | 0 | 1RR | 0 | 8SS,TT,UU,VV,WW | 1RR | 0 | 0 |

AF, amniotic fluid; Array, microarray; CB, cord blood; cFTS; combined first trimester screening; CV, chorionic villi; CVS, chorionic villus sampling; FGR, fetal growth restriction; IUFD, intrauterine fetal demise; Karyo, karyotype; LBW, low birth weight; M, monosomy; NBB, newborn blood; NICU, neonatal intensive care unit; PE, preeclampsia; PPROM, preterm premature rupture of membranes; SA, structural anomaly; T, trisomy; TAB, pregnancy termination; UC, umbilical cord; UPD, uniparental disomy; USS, ultrasound; VSD, ventral septal defect.

AInduced premature birth at 34/40 for severe IUGR (<5%ile). Neonate spent one month in NICU, doing well since..

BAbsent flow through placenta prompting 29-week delivery, placenta 'grossly abnormal' on examination, NICU stay for neonate.

CAbnormal FTS (PAPP-A greatly decreased, hCG greatly increased, T21 risk for 1:1222); . IUGR and PPROM at 31/40. Spontaneous premature delivery at 34/40; low BW (below 5th centile) but neonate well otherwise.

D Normal parental karyotypes. IUGR and PPROM at 35/40, emergency caesarean section. Neonate had VSD and midline cystic structure in the brain.

ENo obstetric details other than term, live-birth.­­

FEight pregnancies with no reported complications and term delivery of a normal neonate.

GOne pregnancy with no reported complications and term delivery of a normal neonate, ‘irritable uterus’, multiple admissions for preterm labour, induced for reduced fetal movement.

HOne pregnancy was noted as progressing normally through 28 weeks and having presence of fibroid but no additional follow-up was provided. IOne pregnancy with oligohydramnios and IUGR, included preterm due to concerns for fetal wellbeing and slowing of growth velocity, birth weight <10%ile.
JOne pregnancy spontaneous preterm birth.
KOne pregnancy with spontaneous preterm birth and IUGR <5%ile.

L One pregnancy spontaneous preterm birth, newborn had cephalohaematoma and was treated in hospital for jaundice (8 days). No other complications.

MIUFD at 13 weeks with no testing.

NCleft lip/palate identified on ultrasound following NIPT; TAB

OOne TAB due to mosaic T7 on diagnostic testing.

PTAB for single gene mutation unrelated to cfDNA findings.

QOne case with normal outcome also had normal maternal microarray.

R"Severe" IUGR and preterm birth (due to IUGR) in case with mosaic T8 on postnatal placental testing.
STAB due to fetal anomalies; no testing or additional follow-up available.

TMiscarriage shortly after cfDNA screening.

UTAB after fetal confirmation of mosaic T10.

VIUFD at 14 weeks, POC after D&C confirmed T14 in all cells.

WTwo cases with cotwin demise (one at 6 weeks, another at 7 weeks); repeat cfDNA screening at later GA was normal for both.
XOne case with severe IUGR, TAB, anomalies on post-mortem exam, PGT-A tested mosaic embryo transfer (75% T15).
YThree cases of 11 week IUFD.
ZOne pregnancy with IUGR, term live-birth.
AATAB in case with mosaicism and mUPD15 found on amniocentesis.

BBOne case with 16p deletion on array, normal pregnancy outcome but child has developmental delays.

CCOne case with cotwin demise at 6 weeks; repeat cfDNA screening at later GA had a signal below reportable level, likely due to demised twin. Ongoing twin normal, term live-birth.
DD,EETwo cases of preeclampsia with induced preterm delivery, one of which also had IUGR.
FFOne case of emergency preterm delivery (C-section) due to preeclampsia at 34 weeks. Placenta appeared thick and slightly abnormal, mosaic T16 on placental testing.

GGAnother preterm delivery had CPM for T16.
HHPreterm delivery was induced due to IUGR/fetal wellbeing with cleft palate noted on newborn exam.
IITwo cases of IUFD with no testing—one at 13 weeks and another at 10-11 weeks.
JJTAB in case with confirmed T16 mosaicism on amnio.

KKOne case with pre-eclampsia, term delivery, live-born. LLOne case with IUGR, cord prolapse, emergency preterm delivery, 8 week NICU stay.
MMCase with spontaneous preterm birth.
NNTAB due to multiple anomalies on ultrasound, also seen on autopsy.
OOFetal demise at 13 weeks, no testing.

PPTwin pregnancy, multiple anomalies in one baby and selective TOP prior to amnio, amnio on remaining twin WNL and normal birth outcome.
QQAnother case of twin demise at 6 weeks with normal repeat cfDNA screening.
RROne case with severe IUGR induced preterm.

SS Two cases IUFD at 12 weeks, no testing.

TT Three cases IUFD at 11 weeks, no testing.

UUIUFD at 12 weeks, cfDNA screen result confirmed on POC testing.

VVSpontaneous miscarriage at 13 weeks, no testing.

WWSpontaneous miscarriage at 12 weeks, no testing.