Pregnancy outcome after fetal reduction in women with a dichorionic twin pregnancy†


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STUDY QUESTION: What are the pregnancy outcomes for women with a twin pregnancy that is reduced to a singleton pregnancy?

SUMMARY ANSWER: Fetal reduction of a twin pregnancy significantly improves gestational age at birth and neonatal birthweight, however at an increased risk of pregnancy loss and preterm delivery.

WHAT IS KNOWN ALREADY: Women with a multiple pregnancy are at increased risk for preterm delivery. Fetal reduction can be considered in these women.

STUDY DESIGN, SIZE, AND DURATION: Retrospective cohort study of 118 women with a twin pregnancy reduced to a singleton pregnancy between 2000 and 2010.

PARTICIPANTS/MATERIALS, SETTING, AND METHODS: We compared the outcome of pregnancy in consecutive women with a dichorionic twin pregnancy that was reduced to a singleton pregnancy to that of women with a dichorionic twin pregnancy that was managed expectantly and women with a primary singleton pregnancy. Reductions were performed between 10–236/7 weeks’ gestation by intracardiac or intrathoracic injection of potassium chloride, mostly for congenital anomalies. We compared median gestational age, pregnancy loss, preterm delivery, neonatal birthweight and perinatal deaths.

MAIN RESULTS AND THE ROLE OF CHANCE: We studied 118 women with a twin pregnancy that was reduced to a singleton, 818 women with an ongoing dichorionic twin pregnancy and 611 women with a primary singleton pregnancy. Loss of the entire pregnancy <24 weeks, preterm delivery <32 weeks, neonatal birthweight and perinatal deaths.

LIMITATIONS, REASONS FOR CAUTION: The main limitations of the study were its retrospective character, and the fact that indications for reduction were heterogeneous.

†The study was presented: as a poster presentation at the 32nd Annual Meeting of the Society of Maternal and Fetal Medicine, Dallas Texas, February 2012

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Introduction

The global incidence of multiple pregnancies has increased both due to the introduction of artificial reproductive technologies and due to increasing maternal age. Although the number of women with a twin pregnancy is currently declining, mainly due to a policy of single embryo transfer in in vitro fertilization (IVF), the incidence of twin pregnancies remains high (Martin et al., 2013; PRN, 2014). In the USA, multiple pregnancies account for 15–20% of all preterm births, consequently increasing the perinatal morbidity and mortality rates (Goldenberg et al., 2008) and associated costs.

Compared with women with a singleton pregnancy, women with a twin pregnancy have a doubled chance of carrying one fetus with a chromosomal or structural abnormality (Evans et al., 1999). Due to the rapid and ongoing advancements in prenatal diagnosis and screening (Avni et al., 2007; Benn et al., 2013), structural and chromosomal abnormalities are diagnosed more often, and at earlier gestation. Consequently, more women are faced with the circumstances of a twin pregnancy with one abnormal fetus. In this situation, selective feticide of fetuses with major or lethal abnormalities might be considered. Other reasons for fetal reduction in women with a dichorionic twin pregnancy could be to reduce obstetric risks associated with a multiple pregnancy or electively for social indications.

Pregnancy reduction from twin to singleton is not as commonly accepted as reduction of triplets and higher orders multiples is. It was first described in 1978 by Alberg, who performed intracardiac puncture of the fetal heart of a fetus affected by Hurler’s syndrome (Alberg et al., 1978). This pregnancy went on as a singleton pregnancy, and ended in live birth of a healthy fetus at a gestational age of 33 weeks. After the introduction of artificial reproductive technologies, the number of reductions increased, both for fetal malformations and for social indications (Yaron et al., 1998). However, still little is known about the course of these pregnancies and, consequently, the suitability of fetal reduction, especially in reductions performed for social indications, or to improve obstetric outcome. The aim of the present study was to assess the course of pregnancy for women with a dichorionic twin that was reduced to a singleton pregnancy, and to compare this course both to women with an expectantly managed twin pregnancy and to women with a primary singleton pregnancy.

Materials and Methods

We performed a retrospective cohort study in 10 perinatal centres in the Netherlands over the period 2000–2010. These centres all prospectively record women that undergo fetal reduction electronically. For this study, we included women with a dichorionic twin pregnancy undergoing fetal reduction to a singleton pregnancy. The procedure was performed transabdominally by intracardiac or intrathoracic injection of potassium chloride using a 20 Gauge or 22 Gauge needle. All procedures were performed between 10/7 and 23/7 weeks’ gestation, as the latter is the maximum gestational age in The Netherlands at which a pregnancy can be terminated legally. The reason for reduction could be either a structural or genetic abnormality in one of the fetuses, the prevention of preterm birth or completely elective.

The course of pregnancy in women with a reduced twin was compared with that of women with an ongoing dichorionic twin pregnancy and to women with a primary singleton pregnancy. Data regarding the ongoing twin pregnancies were collected from one tertiary (Academic Medical Center, Amsterdam) and one secondary hospital (Onze Lieve Vrouwe Gasthuis, Amsterdam). Women in the control group of ongoing twin pregnancies had at least one ultrasound showing two living fetuses performed between 8/7 and 14/7 weeks gestation in the period of 2000–2012. We only included women with a known date of delivery.

The control group of primary singleton pregnancies was selected from women with a vital singleton pregnancy that attended antenatal care at a secondary hospital (Onze Lieve Vrouwe Gasthuis Amsterdam) prior to 16 weeks’ gestation without a medical reason for secondary antenatal care and a known date of delivery. Some women had two or more singleton pregnancies in the study period that met all inclusion criteria; in such cases, we used the first pregnancy only.

Data were collected retrospectively by reviewing maternal and, when appropriate, neonatal and paediatric medical records. Maternal and fetal characteristics were studied, including demographic data, conception mode, gestational age at time of reduction, ultrasound findings including fetal measurements, chorionicity and pregnancy outcome. Pregnancy dating was based on early ultrasound measurements. Conception mode was defined as spontaneous or by use of artificial reproductive technology (ART) including ovulation induction (9%), intrauterine insemination (22%) and IVF/ICSI (69%). Chorionicity was determined at a first trimester ultrasound scan or at post-delivery histological analysis of the placenta by a pathologist. Operator and procedure characteristics were also collected including number of operators and number of procedures per operator.

Pregnancy outcome was based on gestational age at delivery, neonatal birthweight and perinatal death. All cases of fetal demise were defined as intrauterine fetal death (IUF D). Perinatal death was defined as intrauterine fetal death, demise during delivery or demise in the first 7 days after delivery. Neonatal and paediatric information included gestational age at delivery, birthweight and sex.

Statistical analysis

The outcome of the three groups (twin reduced to singleton pregnancies, ongoing twin pregnancies and primary singleton pregnancies) was compared in terms of gestational age at delivery, delivery < 24 weeks, delivery < 32 weeks, neonatal birthweight and number of perinatal deaths. Gestational age at delivery, neonatal birthweight and maternal age were not distributed normally and therefore the median was compared between groups with the Kruskall–Wallis test. We also constructed Kaplan–Meier curves to analyse time to delivery for each group. The Chi-Square test was used to compare the number of deliveries before 24 and 32 weeks, and the number of perinatal deaths among the three study groups.

WIDER IMPLICATIONS OF THE FINDINGS: In women with a dichorionic twin pregnancy fetal reduction increases median gestational age only at considerable risk of complete early pregnancy loss.

STUDY FUNDING/COMPETING INTEREST(S): The study was not funded. None of the authors has conflicts of interest.

Key words: twin pregnancy / fetal reduction / congenital abnormality / pregnancy outcome
For perinatal mortality, we compared the absolute number of perinatal deaths, as well as the number of women that had at least one surviving child, at least one surviving child after 32 and 37 weeks’ gestation. The number of women that had at least one perinatal death and the number of women that had either, all their children (that were intended to survive) or no children surviving were calculated.

We separately studied the impact of early, intermediate or late reduction, defining early reduction as reduction performed <14 weeks of gestation, intermediate between 14 and 20 weeks and late between 20 and 24 weeks. We also performed a subgroup analysis for indication of reduction. Statistical analysis was performed using SPSS 20 (IBM, USA).

Results

In the study period, we identified 120 women who had a dichorionic twin pregnancy that was reduced to a singleton pregnancy. Two of these 120 women were lost to follow-up, leaving 118 women that could be included for final analysis. In the control groups, we included 818 women with an ongoing dichorionic twin pregnancy and 611 with a primary low risk singleton pregnancy. Baseline characteristics of the three groups are shown in Table I. Reduction was performed in nine centres (one centre had no patients that met all inclusion criteria) by 27 operators. The number of reductions in this, 11 year, period varied from 5 to 25 per centre and 1 to 14 per operator.

Mean gestational age at reduction was 16.7 weeks (SD 3.5 weeks) with a range of 10–27–23 weeks. Indications for reduction were hereditary disease, chromosomal or structural abnormality in one fetus (n = 103), history of immature delivery (n = 2) or elective (n = 11). In two cases we could not determine the reason for reduction. The reduction at 102/7 weeks was performed because the twin was discordant for anencephaly.

Figure 1 shows time to delivery in the three different groups. Up to a gestational age of 35 weeks, women with a twin pregnancy reduced to a singleton had a higher risk of delivery than those with an ongoing twin pregnancy. The median gestational age of delivery after reduction was 38.9 weeks (interquartile range (IQR) 34.7–40.3 weeks) compared with 37.1 (IQR 35.3–38.1) weeks in ongoing twins (P < 0.001) and 40.1 (IQR 39.1–40.9) weeks in primary singletons (P < 0.001).

After reduction, 14 (11.9%) women lost their entire pregnancy prior to 24 weeks of gestation. In ongoing twins this happened to 25 (3.1%) women (relative risk (RR) 3.1 (95% confidence interval (CI) 2.0–4.9)), while for primary singletons this happened to 4 (0.7%) women (RR 5.3 (95% CI 3.9–7.2)). Moreover, 22 (18.6%) women delivered prior to 32 weeks after reduction compared with 94 (11.5%) women with an ongoing twin pregnancy (RR 1.6 (95% CI 1.1–2.5)) and 6 (1%) women with a primary singleton pregnancy (RR 5.7 (95% CI 4.4–7.5)).

Table I Baseline characteristics.

<table>
<thead>
<tr>
<th></th>
<th>Twin reduced (118)</th>
<th>Twin not reduced (818)</th>
<th>Singleton (611)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal age</td>
<td>35.7 (32.6–38.8)</td>
<td>35.1 (31.6–38)</td>
<td>36.8 (32.8–39.1)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Nulliparity</td>
<td>36 (30.5%)</td>
<td>211 (54.7%)*</td>
<td>398 (65.1%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Spontaneous conception1</td>
<td>67 (64.5%)</td>
<td>367 (57%)</td>
<td>509 (83.4%)</td>
<td>&lt;0.001</td>
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Data presented as median (IQR) or number (%).

*Data only available for 386 patients.

Table II shows that the number of women with all intended fetuses surviving was 101 (85.6%) in the reduction group versus 769 (94%) for ongoing twins (RR 0.84 (95% CI 0.73–0.97)). For primary singletons, this was 607 (99.3%) (RR 0.22 (95% CI 0.09–0.54)). In the ongoing twin group 21 (2.6%) women had only one surviving child. There were 17 (14.4%) women in the reduction group versus 28 (3.4%) (RR 3.3 (95% CI 2.2–5.1)) in the ongoing twin group and 4 (0.7%) (RR 5.6 (95% CI 4.3–7.5)) in the primary singleton group in whom not a single fetus survived.

The number of women that delivered at 32+0 weeks of gestation or after and had at least one child surviving was 95 (99%) after reduction, 724 (100%) in ongoing twins and 605 (100%) in primary singletons. For deliveries at 37+0 weeks or after this was 84 (98.8%), 452 (100%) and 585 (100%), respectively.

Median neonatal birthweight was 3125 grams (IQR 2290–3645) in the reduction group, 2578 grams (IQR 2139–2923) in ongoing twins, and 3450 (IQR 3115–3735) in primary singletons (P < 0.001). Table III shows that the number of women with all intended fetuses surviving was 101 (85.6%) in the reduction group versus 769 (94%) for ongoing twins (RR 0.84 (95% CI 0.73–0.97)). For primary singletons, this was 607 (99.3%) (RR 0.22 (95% CI 0.09–0.54)). In the ongoing twin group 21 (2.6%) women had only one surviving child. There were 17 (14.4%) women in the reduction group versus 28 (3.4%) (RR 3.3 (95% CI 2.2–5.1)) in the ongoing twin group and 4 (0.7%) (RR 5.6 (95% CI 4.3–7.5)) in the primary singleton group in whom not a single fetus survived.

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</tbody>
</table>

Data presented as median (IQR) or number (%).

*Data only available for 386 patients.

Table II Nine missing in twin reduced group, 175 in twin not reduced group and one in singleton group.
Figure 2 shows the relation between gestational age at reduction and time of delivery. It shows that most losses occur in a few weeks after reduction. However, median gestational age at delivery did not differ for time of reduction, or for indication of reduction (Tables IV and V).

**Discussion**

In this study, we analysed the outcome after reduction of one fetus in women with a dichorionic twin pregnancy and compared this to women with an expectantly managed twin pregnancy and to women with a primary singleton pregnancy. Reduction resulted in 2 weeks prolongation of pregnancy (38.9 versus 37.1 weeks), but not to the level of a primary singleton pregnancy (40.1 weeks). On the other hand, reduction resulted in a higher rate of pregnancy loss prior to 24 weeks compared with a non-reduced twin pregnancy (11.9 versus 3.1%) and consequently a higher rate of perinatal deaths (14.4 versus 4.7%).

Our findings are comparable to other publications on this subject. Evans et al. reported a 7% miscarriage rate and 20% premature delivery rate, in a cohort of 345 women that underwent selective reduction for a fetal indication (Evans et al., 1999). In 52 twins electively reduced to singletons, he reports a median gestational age of 37.2 weeks. (Evans et al., 2004). Nobili et al. found a median gestational age of 37.2 weeks and premature delivery rate of 22% in 32 twins reduced to singleton. Hasson

**Table II** Pregnancy outcome.

<table>
<thead>
<tr>
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<th>Twin reduced (118)</th>
<th>Twin not reduced (818)</th>
<th>Singleton (611)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age at delivery (weeks)</td>
<td>38.9 (34.7–40.3)</td>
<td>37.1 (35.3–38.1)</td>
<td>40.1 (39.1–40.9)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Delivery &lt;24 weeks</td>
<td>14 (11.9%)</td>
<td>25 (3.1%)</td>
<td>4 (0.7%)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Delivery &lt;32 weeks</td>
<td>22 (18.6%)</td>
<td>94 (11.5%)</td>
<td>6 (1%)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Birthweight 1 (g)</td>
<td>3125 (2290–3645)</td>
<td>2578 (2139–2923)</td>
<td>3450 (3115–3735)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Birthweight 2 (g)</td>
<td>2490 (2090–2900)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data presented as median (IQR) or number (%).  
*Difference between all groups.

**Table III** Perinatal death.

<table>
<thead>
<tr>
<th></th>
<th>Twin reduced (118)</th>
<th>Twin not reduced (818)</th>
<th>Singleton (611)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perinatal death 1</td>
<td>17 (14.4%)</td>
<td>40 (4.9%)</td>
<td>4 (0.7%)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Perinatal death 2</td>
<td></td>
<td>37 (4.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All surviving</td>
<td>101 (85.6%)</td>
<td>769 (94%)</td>
<td>607 (99.3%)</td>
<td>0.001*</td>
</tr>
<tr>
<td>No surviving</td>
<td>17 (14.4%)</td>
<td>28 (3.4%)</td>
<td>4 (0.7%)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>At least one surviving</td>
<td>101 (85.6%)</td>
<td>790 (96.6%)</td>
<td>607 (99.3%)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>At least one died</td>
<td>17 (14.4%)</td>
<td>49 (6%)</td>
<td>4 (0.7%)</td>
<td>0.001*</td>
</tr>
<tr>
<td>At least one surviving &gt;32 weeks</td>
<td>95/96 (99%)</td>
<td>724/724 (100%)</td>
<td>605/605 (100%)</td>
<td>N.A.</td>
</tr>
<tr>
<td>At least one surviving &gt;37 weeks</td>
<td>84/85 (98.8%)</td>
<td>452/452 (100%)</td>
<td>585/585 (100%)</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Data presented as number (%).  
N.A., not analysed.  
*Difference between all groups.
et al. \((n = 32)\) found no improvement in gestational age between reduced and non-reduced twins \((36.5 \text{ versus } 36.2 \text{ weeks, respectively})\) and no decline in birth rates \(< 37 \text{ and } < 34 \text{ weeks (Hasson et al., 2011)}\). Antsaklis et al. found a gestational age of 38 weeks in 43 twins reduced to a singleton, 3 miscarriages \((7\%)\) and 10 preterm births \((23.3\%)\) \((Antsaklis et al., 2004)\). In a systematic review on selective feticide in twins discordant for anencephaly, Lust et al. found no difference in perinatal mortality after selective feticide compared with expectant management, but they found a longer median gestation after selective feticide, 38.0 weeks versus 34.9 weeks, respectively \((Lust et al., 2008)\). Vandecruys et al. discuss a series of 44 dichorionic twins discordant for anencephaly \((Vandecruys et al., 2006)\). In this study, nine women underwent feticide of which one \((12.5\%)\) had a miscarriage before 24 weeks and one \((12.5\%)\) had a preterm birth \(< 32 \text{ weeks}\). Of the 35 women with expectant management, 20 \((57.5\%)\) developed polyhydramnios and three \((8.6\%)\) delivered before 32 weeks. Alvarado et al. found a median gestational age of 38 weeks in 28 women with selective termination because of twins discordant for abnormalities and a 3.6\% miscarriage rate and 11.8\% preterm birth \(< 34 \text{ weeks}\) \((Alvarado et al., 2012)\).

Antsaklis et al. did not find a difference between early and late procedures whereas Hasson et al. found more complications in pregnancies reduced after 15 weeks gestation compared with those prior to 15 weeks gestation \((Hasson et al., 2011)\). This finding was supported by Yaron et al. \((n = 82)\) who compared early \(< 14 \text{ weeks}\) and late procedures and found a gestational age at birth of 38.4 versus 35.7 weeks, respectively \((Yaron et al., 1998)\). The conclusion in this study was to perform reductions as early as possible. In our study, we did not find a difference in gestational age at birth between early, intermediate and late reductions, but the numbers are probably too small to draw definitive conclusions.

In light of the previous studies of Yaron and Hassan \((Yaron et al., 1998; Hasson et al., 2011)\), and the high rate of miscarriage we found in this study, reasonable advice would be to perform reduction as early as possible. This implies that in countries such as the Netherlands, where termination of pregnancy, including feticide is legally restricted after 24 weeks’ gestation for non-lethal anomalies, the focus of first trimester screening should shift from just Down’s syndrome, towards a structural fetal anomaly scan, which nowadays can be performed at 11 – 13 weeks’ gestation accurately \((Vandecruys et al., 2006)\). Another option is to postpone feticide until 32 weeks of gestation, a term less dangerous for the healthy co-twin. However, since this option is not possible in all countries, including the Netherlands, parents should be made aware that feticide may be performed in some European countries for fetal indications.

Our study compared selective feticide to elective reduction, but could not demonstrate difference in pregnancy outcome between indications. However, it is possible that our groups were too small for accurate analysis. Theoretically, fetal reduction for elective indications could be accompanied with fewer complications when compared with selective feticide, since the technically most easily accessible fetus can be reduced. Moreover the fetus furthest away from the internal cervical os can be designated for reduction to minimize the risk of infection or premature rupture of membranes followed by immature delivery. In case of selective feticide of a structurally or chromosomally abnormal fetus, the procedure can be difficult depending on fetal position. Moreover, in those cases the operator may not be able to prevent reduction of the twin closest to the cervical os.

This is one of the larger studies that have analysed the pregnancy outcome after reduction in dichorionic twin pregnancies. In this nationwide study, all hospitals performing fetal reduction participated, thus increasing the external validity of our findings. Moreover, we included patients in a long timeframe, which increased the power. The control groups were selected carefully with strict inclusion criteria. The baseline characteristics of the three groups differed for mode of conception and parity, obviously, since this was not a randomized trial. In the earlier period of our study, it was not common to have a digital registration of

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**Table IV Pregnancy outcome by time of reduction.**

<table>
<thead>
<tr>
<th>Reduction</th>
<th>Gestational age at delivery (weeks)</th>
<th>Delivery &lt; 24 weeks</th>
<th>Delivery &lt; 32 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 14 weeks (36)</td>
<td>39 (38.4–40.4)</td>
<td>3 (8.3%)</td>
<td>3 (8.3%)</td>
</tr>
<tr>
<td>14–20 weeks (51)</td>
<td>38.2 (32.4–40.1)</td>
<td>8 (15.7%)</td>
<td>11 (21.6%)</td>
</tr>
<tr>
<td>20–24 weeks (30)</td>
<td>38.9 (32.1–40.2)</td>
<td>2 (6.7%)</td>
<td>7 (23.3%)</td>
</tr>
</tbody>
</table>

Data presented as median (IQR) or number (%).

**Table V Pregnancy outcome by indication for reduction.**

<table>
<thead>
<tr>
<th>Indication</th>
<th>Elective (11)</th>
<th>Congenital abnormality (105)</th>
<th>Obstetric history (2)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age at delivery (weeks)</td>
<td>38.6 (19.9–40.3)</td>
<td>39.0 (36.1–40.4)</td>
<td>35.8 (33.7–38.0)</td>
<td>0.22</td>
</tr>
<tr>
<td>Delivery &lt;24 weeks</td>
<td>3 (27.3%)</td>
<td>11 (10.7%)</td>
<td>0</td>
<td>N.A.</td>
</tr>
<tr>
<td>Delivery &lt;32 weeks</td>
<td>3 (27.3%)</td>
<td>19 (18.4%)</td>
<td>0</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Data presented as median (IQR) or number (%).

N.A., not analysed.
first trimester ultrasound scans in The Netherlands, indicating that we could have missed data yielding our control groups. However, it is not likely that this would influence the data significantly because we based our inclusion on the availability of first trimester data and not on pregnancy outcome.

In our group of women with a primary singleton only 84% of women had a spontaneous conception, which is lower than in the general population. Apparently, women with assisted reproduction are more likely to attend secondary antenatal care than women with a natural conception. The same holds for maternal age, which was relatively high in the primary singleton group. However, the median gestational age of 40.1 weeks at which this group indicated that it is representative.

Evans showed that, in women with a multiple pregnancy undergoing multi fetal pregnancy reduction, the end number of fetuses is influenced by maternal age as women reducing to twins have an average age of 37 years and those reducing to singletons 42 years.

We showed that, until 35 weeks of gestation, women that had their twin reduced to a singleton had a higher chance to deliver prematurely than those without reduction. Furthermore, the median 2-week prolongation of pregnancy after fetal reduction did not result in a lower perinatal mortality rate, but was at the expense of an 11.9% risk of pregnancy loss before 24 weeks’ gestation. Therefore, fetal reduction of a twin to a singleton pregnancy to improve the obstetric outcome should not be advised. Consequently, we recommend to be very reluctant with reduction from twin to singleton and to apply stringent criteria such as severe, non-lethal, fetal abnormalities. With the steadily ongoing rise of the average age at the time of conception of the first child in the Western World, the chance of conceiving a multiple pregnancy or a chromosomally abnormal fetus (Usta and Nassar, 2008) is proportionally increasing. Subsequently, we could expect more women seeking our services for fetal reduction to a singleton. As feticide can probably best be performed before 14 weeks of gestation, it would be optimal to perform a detailed fetal anomaly scan in women with a multiple pregnancy at 11–13 weeks’ gestation. In fetuses with severe, non-lethal abnormalities, feticide can be performed <14 weeks, alternatively a tailored expectant management with feticide in the third trimester can be considered (Vandecruys et al., 2006). However, the latter includes the risk of a live born abnormal fetus in case of preterm birth before the feticide. In fetuses with severe, lethal abnormalities expectant management of the twin pregnancy and provision of non-intervention comfort care for the affected neonate has shown to have good outcome for the non-affected co-twin and is also reported to be satisfactory for parents (Linskens et al., 2011). Only when a lethal abnormality is threatening the normal co-twin, for instance in case of development of severe polyhydramnion, should selective feticide be considered. Parents need to be counselled that undergoing fetal reduction always exposes the healthy remaining fetus to a risk of serious complications possibly resulting in preterm birth.

**Authors’ roles**

L.v.d.M. collected data, analysed data and drafted the manuscript. S.M.P.E. collected data of the study group and critically read the manuscript. M.F.C.M.K., M.C.H., M.A.J.E., G.T.R.M., H.A.Z., S.A.M.W., J.M.G.v.V., J.H.M.E., C.B. and M.G.v.P. collected data in their own hospitals and critically read the manuscript. C.J.M.d.G., B.W.J.M. and E.P. participated in the study design, critically read and supervised manuscript drafting.

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**Conflict of interest**

None declared.

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PRN. The Netherlands Perinatal Registry. www.perinatreg.nl (6 October 2014, date last accessed).

