Twin pregnancy complicated by intrauterine death of one fetus

AGATA SZPERA-GOŻDZIEWICZ, ANNA DERA, GRZEGORZ H. BRĘBOROWICZ

Abstract

Introduction: Intrauterine fetal death (IUFD) of one twin is a relatively frequent complication of twin pregnancy. Prognosis of the surviving twin seems to be the main problem. There is no agreement on etiology and mother’s coexistent diseases of this complication of twin pregnancy. Management is not consensual and suffers from the lack of guidelines. Aim: The aim of our study was to evaluate course of such pregnancies and neonatal complications. Material and methods: All patients were admitted to Department of Perinatology and Gynecology Poznań University of Medical Sciences. We assessed the course of pregnancy and frequency of neonatal complications respectively. The retrospective study included data from year 1998 to 2008. The study group included 39 woman in twin pregnancy with intrauterine fetal death and their neonates. The control group were 40 woman in twin pregnancy and their neonates. The study group was correlated with the control group. Results: We found statistically significant differences in mean birth weight, gestational week at delivery, discordant growth, hyperbilirubinemia of first twin, few abnormalities concerning blood gases, intrauterine growth restriction of first twin, anemia and hypoxia of first twin, respiratory distress syndrome (RDS) and intraventricular haemorrhage (IVH) of first twin. There were no differences in course of pregnancy between two groups despite of higher prevalence of preterm birth in study group. Conclusions: There is higher risk of pregnancy and neonatal complications for survival fetus after intrauterine death of one fetus.

Key words: intrauterine fetal death in twin pregnancy, neonatal complications, twin pregnancy

Introduction

Single intrauterine fetal death rate in multiple pregnancy is significantly higher than that in singleton. That risk increases with the number of fetuses. In twin pregnancy this pathology occurs in 2.7 % and in triplet pregnancy in 4.3%. [1]

The knowledge about etiopathogenesis of intrauterine fetal death in twin pregnancy is limited. There are many factors which are taken into consideration, e.g. congenital malformations, intrauterine growth restriction (IUGR), placental abruption, blunt abdominal injury, umbilical vein thrombosis, chorioamnionitis, severe pre-eclampsia, twin to twin transfusion syndrome (TTTS), preterm premature rupture of the membranes (PROM), twin reversed arterial perfusion (TRAP) and cervical insufficiency. Probably, placental abruption is a major risk factor for stillbirth and its risk is significantly elevated in multiple pregnancies. One of the most important and independent risk factor for intrauterine fetal death in twin pregnancy is discordant growth. However, the role of chorionicity is also of great significance. Recent researchers proved that demise of one twin occurs after 24 weeks of gestation in 1.1% of dichorionic twins compared to 3.6% of monochorionic twins. On the other hand, this risk is higher before 24 weeks of gestation and its prevalence is to 12.2% for monochorionic pregnancy and 1,8% for dichorionic pregnancy. Certainly, it is closely connected with complications specific to monochorionic multiple pregnancy such as TTTS and TRAP [2, 3].

Some authors take ART (Assisted Reproductive Technology) into consideration as one of the important factors increasing the risk of IUFD; however, the mechanism of this complication remains unknown.

There may be a correlation between IUFD of the fetus with an unfavorable prognosis for the surviving embryo. The data, however, is not coherent [4, 5].

So far, there is no agreement as to the risk of developmental defects when there is fetal demise in the first trimester. Some data are indicative of a growing risk, where as other exclude such possibility. As far as the second trimester is concerned, literature reports show an increased risk of vascular complications and therefore an increased percentage of visceral and skin damage. On the other hand damage of the central nervous system is characteristic of the third trimester [2, 6].

All these complications are dependent on chorionicity, which is connected with the presence of anastomoses in monochorionic pregnancy and a possible export of the factors influencing the coagulation system from the demised to the surviving fetus. It is certain,
however, that, irrespective of when one of the fetuses died of IUFD, monochorionic pregnancies entail a significantly higher death risk of the surviving fetus. This is in opposition to dichorionic pregnancies in which such trends have not been found (1-st and 2-nd trimester) or it was markedly decreased (3-rd trimester) [2, 7, 8].

Reports on fetal birth weight of the surviving fetus are not unequivocal. Some authors describe the risk of smaller birth weight in such neonates; others do not show such differences. The data on the risk of preterm delivery are similar. It seems, however, that these variables also stem from the time when intrauterine death occurred as well as chorionicity of pregnancy [9-11].

Material and methods

The study was conducted among 79 patients who were in twin pregnancy. All pregnant women and their children were hospitalized in the ObGyn Hospital of Poznan University of Medical Sciences between 1998 and 2008.

In the study group there were 39 patients in twin pregnancy complicated by intrauterine fetal death of one twin. There were 8 cases (20,5%) of IUFD of 1-st fetus and 29 cases (74.3%) of IUFD of 2-nd fetus. Control group consist of 40 women in twin pregnancy without fetal death.

There were N = 20 male (51%) 1-st fetuses, N = 17 female (43%) 1-st fetuses, N = 18 (46%) male 2-nd fetuses and N = 12 (30%) female 2-nd fetuses in the study group. In the control group there were N=15 (37%) male 1-st fetuses, N = 25 (63%) 1-st female fetuses, N = 28 (70%) male 2-nd fetuses and N = 12 (30%) female 2-nd fetuses. In 9 (23%) pregnancies in the study group genders of the fetuses were different as well as in N = 15 (37%) pregnancies in the control.

Parameters of blood gases from umbilical cord, occurrence of intrauterine growth restriction, gestational hypertension, preeclampsia, twin-to-twin transfusion syndrome, premature preterm rupture of membranes, polyhydramnion, pregnancy after IVF as well as chorioamnionitis were respectively evaluated.

Clinical analysis of all newborns from the studied groups concerned the frequency of the following complications: 1) anemia, 2) hypoxia, 3) hiperbilirubinemia, 4) infections including pneumonia, urinary tract infections, 5) respiratory distress syndrome (RDS), 6) intraventricular haemorrhages (IVH), 7) necrotizing enterocolitis (NEC), 8) retinopathy of prematurity (ROP), 9) bronchopulmonary dysplasia (BPD), 10) congenital malformations.

The Shapiro-Wilk test was used to analyze the character of distribution. For further evaluation of the variables between groups, the following tests were used: Mann-Whitney and Fisher two-sided. Spearman test was used to correlate variables within the study group. Statistical significance was accepted as being p < 0.05.

Results

The mean gestational age of IUFD was 27.2 weeks (12.38). The mean gestational age at delivery was 33.6 ± 4.14 weeks in the study group and 36.4 ±1.64 weeks in the control group (p < 0.001).

Cesarean section was performed in N= 30 (76.9%) women in the study group and N = 35 (87%) in control. No significant differences was observed between these groups. Indications for cesarean section were: 1) distress of the fetus (45%), 2) unfavorable conditions for spontaneous delivery (33%), 3) maternal complications (17%) and other (5%).

The mean birth weight of neonates delivered by mothers from the study group was 2033 ± 880 g of 1-st twin, 1087 ± 813 g of 2-nd twin. In the control group mean birth weight of 1-st twin was 2685 ± 479 g and 2628 ± 423 g as for 2-nd one. There were statistically significant differences between study and control group in mean birth weight of 1-st and 2-nd twin (p < 0.001).

Weight discordance was counted as weight difference between twins divided by weight of smaller twin. The median was 42.2% (2.3-98.8) and 13.5% (0-36.8) in the study and control group respectively (< 0.001).

The characteristics of newborns outcome at delivery are presented in the table 1.

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<th>Table 1. Characteristics of newborns outcome</th>
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As for pregnancy complications there was only one significant difference between study and control group. IUGR of 1-st twin occur in $N=5$ (12%) and $N=0$ (0%) in study and control group respectively ($p = 0.023$). There were no differences in occurrence of gestational hypertension, preeclampsia, twin-to-twin transfusion syndrome, premature preterm rupture of membranes, polyhydramnion, pregnancy after IVF as well as chorioamnionitis. The characteristics of pregnancy complications are presented in the table 2.

The characteristics of neonatal complications are presented in the table 3.

In the study group we found several significant correlations. Intrauterine fetal death correlates with chorioamnionitis ($R = 0.34, p = 0.047$); hypoxia of 2-nd twin correlates with 2-nd twin IUGR ($R = 0.69, p < 0.001$); 2-nd twin IUGR correlates with chorioamnionitis ($R = 0.36, p = 0.038$); 2-nd twin anemia correlates with pneumonia of the fetus ($R = 0.69, p < 0.001$) and necessity of assisted ventilation ($R = 0.55, p < 0.001$); RDS $1^o$ and $2^o$ of 1-st twin correlates with its necessity of assisted ventilation ($R = 0.53, p < 0.001$).

Discussion

Intrauterine single fetal death in twin pregnancy is a serious complication of such pregnancies. This study compared the perinatal outcome of twins surviving IUFD with neonates from normal twin pregnancy. It was found that pregnancies diagnosed with IUFD have a higher rate of neonatological complications. Also, there were significant differences in gestational age at delivery and twins’ weight.

Intrauterine death can occur at any time of gestation. In our study time of IUFD ranged from 12 to 38 weeks of gestation, with the mean time 27 weeks. According to HHN Woo et al. [7] death in the late second or third trimester is connected with significant mortality and morbidity in the surviving twin. It corresponds with Landy’s [12] conclusion that IUFD in the first trimester gives good prognosis for surviving twin.

In the current study there was no data on chorionicity which has a great impact on twin pregnancy’s outcome, particularly in case of IUFD. The incidence of unfavourable outcome is higher in monochorionic gestation [13]. According to Santema et al. [14] the prevalence of monochorionicity in IUFD in twins reaches from 50 to 70%.

Management of IUFD is not consensual and suffers from the lack of guidelines. According to our studies, twin pregnancies after IUFD require immediate and fre-
Twin pregnancy complicated by intrauterine death of one fetus

quent serial assessment of the status of the surviving fetus(es) using sonography, biophysical profile, Doppler flow studies, and external fetal heart rate monitoring. In certain situation cordocentesis should be considered.

Nevertheless, Malone et al. [15] suggest that such proceedings can’t assure good outcome in monochronic pregnancies complicated by IUFD because of possible injury of surviving twin during the other’s demise. Due to detect possible neurologic complication of multicystic encephalomalacia, Cleary-Goldman et al. [16] indicates for purposefulness of MRI approximately 2 to 3 weeks after IUFD.

Because of the possibility of significant sequelae in the surviving newborn, delivery should take place in a tertiary care institution where immediate neonatological support is available. According to our studies the timing and method of delivery should be decided by standard obstetrical indications. Aiming vaginal delivery is not contraindicated. Fusi and Gordon [13] revealed that there is no evidence that birth of the surviving twin by cesarean section will improve the prognosis.

There is higher risk for preterm birth in twin pregnancies with IUFD so steroids should be administered (< 34 ga) to induce pulmonary maturity [17]. Petersen et al. [18] concluded that the main problem for the surviving twin was prematurity. Also Santema et al. [14] reported prematurity as a main cause of neonatal death. Steroids prophylaxis can decrease percentage of those complications.

References


Agata Szpera-Goździewicz
Perinatology and Gynecology Department
Poznan University of Medical Sciences
60-535 Poznań, ul. Polna 33, Poland
e-mail: agata.szpera@gmail.com