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Original Article

Study on fetal reduction in multiple births

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Abstract: To compare the clinical effect of second trimester multifetal pregnancy reduction. Multifetal pregnant patients (n = 152) including triplets and quadruplets were assisted reproductive technology (ART) pregnancy. Surgical methods using transabdominal ultrasound-guided injection of potassium chloride fetal heart is carried out. Fetal reduction and control groups of 28 to 34 weeks of pregnancy birth rate was 6.2%, respectively (8/130) and 6.4% (9/140), the incidence of fetal growth inequality was 12.3% (16/130) and 11.4% (16/140), GDM incidence was 3.1% (4/130) and 2.1% (3/140), respectively, Hypertensive disorder complicating pregnancy (HDCP) incidence rate was 11.5% (15/130) and 8.6% (12/140), respectively, fetal reduction group and the control group, the difference was not statistically significant. Implementation of selective fetal reduction will reduce multiple pregnancy, there is a risk of miscarriage after master the surgery, surgery before 16 weeks of pregnancy, to a certain extent reduce the abortion rate.

Keywords: Fetal reduction, multiple births, abortion rate, risk

Introduction

Multiple pregnancy rates in China have recently increased, with the wide application of assisted reproductive technologies (ART) [1-8]. To avoid the increased incidence of abortion and premature labor associated with multiple pregnancies, multifetal pregnancy reduction (MFPR) was introduced. This procedure has been shown to be both safe and effective [9-18].

To reduce maternal complications of multiple pregnancies and improve pregnancy outcomes, second trimester multifetal pregnancy reduction has been widely used in clinical practice. Hospital for treatment of obstetric 2002-2012 three and four-fetal pregnancies 152 cases, after assisted reproductive technologies (assisted reproductive technology, ART) pregnancy, pregnancy 12 to 13^{+6} weeks (91 cases), pregnancy 14 to 15^{+6} weeks (32 cases), pregnancy 16 to 24^{+6} weeks (29 cases) underwent fetal reduction, control of twin pregnancies after ART 150 cases of pregnant women. Surgical methods using transabdominal ultrasound-guided injection of potassium chloride fetal heart is carried out [19-23]. And abortion rates and pregnancy outcomes were compared, which are reported below.

Materials and methods

Fetal reduction group in Provincial Hospital Affiliated to Shandong University obstetrics clinic in January 2002 to February 2012 period of three and four fetal pregnancies 152 cases, all assisted reproductive technology (assisted reproductive technology, ART) pregnancy, respectively pregnancy 12 to 13^{+6} weeks (91 cases), pregnancy 14 to 15^{+6} weeks (32 cases), pregnancy 16 to 24^{+6} weeks (29 cases) underwent fetal reduction, in the control group, twin pregnancy after ART 150 cases. Surgical methods using transabdominal ultrasound-guided injection of potassium chloride fetal heart.

Methods

A retrospective analysis of records gestational age and birth weight, gestational diabetes (gestational diabetes mellitus, GDM) and gestational hypertension (hypertensive disorder complicating pregnancy, HDCP) incidence were observed.

Table 1. Fetal reduction and control groups to compare the rate of abortion

Groups	Number	Abortion	
		Number	Percentage (%)
Fetal reduction group	152	22	14.5
12~13^{+6} weeks	91	8	8.8
14~15^{+6} weeks	32	5	15.6
16~24^{+6} weeks	29	9	31.0^{b,c}
Control group	150	10	6.7
χ^{2a}		4.857	
P^{a}		0.028	

Note: [a]combination denominated fetal reduction compared with control group; [b]compared with 12 to 13^{+6} weeks fetal reduction group (χ^2 = 7.212, P = 0.007); [c]compared with control group (χ^2 = 12.749, P = 0.000).

Values were expressed as mean ± standard deviation (SD) since data were normally distributed. For continuous data, multiple comparisons were made using one-way analysis of variance (ANOVA), and for categorical data, we used x^2 test. Statistical analyses were performed with the Statistical Package for Social Sciences (version 13.0; SPSS, Chicago, IL). A *p*-value of <0.05 was considered to be statistically significant.

Results

Abortion rate

Group fetal reduction abortion rate (14.5%) was higher than control group (6.7%), the difference was statistically significant (P<0.05). Different gestational fetal reduction group, the pregnancy of 16 to 24^{+6} weeks fetal reduction group abortion rate (31.0%) is higher than the gestation of 12 to 13^{+6} weeks fetal reduction group (8.8%) and the control group (6.7%), the difference was statistically significant (P<0.05), **Table 1**. Miscarriage rate of 12 to 13^{+6} weeks fetal reduction group (8.8%), respectively, and 14 to 15^{+6} weeks fetal reduction group (15.6%) and the control group (6.7%), the difference was not statistically significant (χ^2 respectively 0.370 and 1.739, P>0.05).

The average gestational age and birth rates of 28 to 34 weeks gestation

Fetal reduction group and the control group, the mean gestational age and group 28 to 34 weeks gestation birth rate, the difference was not statistically significant (P>0.05). Pregnancy 12~13^{+6}, 14~15^{+6}, 16 to 24^{+6} weeks fetal reduction group compared with the control group, the mean gestational age (t = -0.909, 1.097 and -0.134) and 28 to 34 weeks of pregnancy childbirth rate (χ^2 = 0.315, 0.790 and 0.000) differences are not statistically significant (P>0.05). The results are shown in **Table 2**.

Birth weight

A heavy weight child birth weight, B light-weight child birth weight, fetal growth and inequality, the three indicators of fetal reduction group and the control group, the difference was not statistically significance (P>0.05). Pregnancy 12~13^{+6}, 14~15^{+6}, 16 to 24^{+6} weeks fetal reduction group compared with the control group, birth weight A (t = -0.791, 1.308 and -0.170), birth weight B (t = -0.737, 1.198 and -0.129) and the incidence of fetal growth uneven (χ^2 = 0.174, 0.491 and 0.009) differences are not statistically significant (P>0.05). The results are shown in **Table 2**.

The incidence of GDM and HDCP

Fetal reduction group and the control group, minus compare different gestational age, GDM and HDCP incidence was no significant difference (P>0.05) between the two groups. Pregnancy 12~13^{+6}, 14~15^{+6}, 16 to 24^{+6} weeks fetal reduction group compared with the control group, GDM incidence (χ^2 = 0.000, 0.000 and 0.000) and HDCP onset (χ^2 = 0.315, 0.003 and 0.263) differences are not statistically significant (P>0.05). The results are shown in **Table 2**.

Conclusions

The timing of fetal reduction surgery was postponed until the second trimester. The reduced fetal surgery in early pregnancy were usually selected, but in early pregnancy it is difficult to determine whether the defects in the fetus or not, embryo damage rate is higher, and the risk of infection through vaginal operation is higher. The second trimester fetal reduction does not increase the incidence of maternal and fetal complications, can effectively avoid early pregnancy fetal reduction surgery blindness, not only reduce the number of multiple pregnan-

Table 2. Comparison of pregnancy outcomes and complications between the two groups after 28 weeks of pregnancy in the reduced group and the control group

A.

Groups	Number of births after 28 weeks of pregnancy	Average gestational age c ($\overline{X}$±s, week)	28 to 34 weeks of pregnancy childbirth		Birth Weight ($\overline{X}$±s, g)	
			Number	Percentage (%)	A	B
Fetal reduction group	130	36.90±1.80	8	6.2	2720.42±455.04	2409.15±412.63
12~13^{+6} weeks	83	36.74±1.95	7	8.4	2682.61±445.98	2373.13±395.29
14~15^{+6} weeks	27	37.37±1.12	0	0.0	2843.70±434.19	2524.81±400.25
16~24^{+6} weeks	20	36.91±1.88	1	5.0	2711.75±511.31	2402.50±487.54
Control group	140	36.97±1.82	9	6.4	2729.06±413.79	2416.21±436.79
t or χ^{2a}	4.857	-0.346	0.009		-0.163	-0.136
P^{a}	0.028	0.729	0.926		0.870	0.892
F or χ^{2b}	8.833	1.269	2.564		1.290	1.388
P^{b}	0.012	0.285	0.278		0.279	0.253

B.

Groups	Fetal growth uneven		GDM		HDCP	
	Number	Percentage (%)	Number	Percentage (%)	Number	Percentage (%)
Fetal reduction group	16	12.3	4	3.1	15	11.5
12~13^{+6} weeks	8	9.6	2	2.4	9	10.8
14~15^{+6} weeks	5	18.5	1	3.7	3	11.1
16~24^{+6} weeks	3	15.0	1	5.0	3	15.0
Control group	16	11.4	3	2.1	12	8.6
t or χ^{2a}	0.050		0.659		0.010	
P^{a}	0.823		0.417		0.921	
F or χ^{2b}	1.647		0.408		0.279	
P^{b}	0.439		0.816		0.870	

Note: [a]means combination denominated fetal reduction compared with control group; [b]means minus fetal gestational age groups in different groups.

cies, but also to avoid the abnormal birth, reduce maternal complications and improve the quality of newborns.

Disclosure of conflict of interest

None.

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References

[1] Gibson J, Cameron A. Complications of monochorionic twins. Paediatrics and Child Health 2008; 18: 568-573.

[2] Feng YJ, Shen K, Ma D, Kong BH, Li L. Obstetrics and gynecology. Beijing: People's Hygiene Press; 2005. pp. 65.

[3] Olivennes F, Doumerc S, Senat MV, Audibert F, Fanchin R, Frydman R. Evidence of early placental vascular anastomosis during selective embryo reduction in monozygotic twins. Fertil Steril 2002; 77: 183.

[4] Athanasiadis AP, Zafrakas M, Tarlatzis BC, Vaitsi V, Mikos T, Bontis J. Multifetal pregnancy reduction in pregnancies with a monochorionic component. Fertil Steril 2005; 83: 474-476.

[5] Li R, Chen X, Yang S, Yang R, Ma C, Liu P, Qiao J. Retain singleton or twins? Multifetal pregnancy reduction strategies in triplet pregnancies with monochorionic twins. Eur J Obstet Gynecol Reprod Biol 2013; 167: 146-148.

[6] Yang R, Li R, Chen XN, Qiao J. Successful pregnancy and delivery after multifetal pregnancy reduction in a woman with monochorionic triplet pregnancy following intracytoplasmic sperm injection and the transfer of frozen-thawed embryos. Journal of Reproduction and Contraception 2014; 25: 119-122.

[7] Leondires MP, Ernst SD, Miller BT, Scott RT Jr. Triplets. Outcomes of expectant management versus multifetal reduction for 127 pregnan-

cies. Am J Obstet Gynecol 2000; 183: 454-459.
[8] Rebarber A, Carreno CA, Lipkind H, Funai EF, Maturi J, Kuczynski E, Lockwood C. Cervical length after multifetal pregnancy reduction in remaining twin gestations. Am J Obstet Gynecol 2001; 185: 1113-1117.
[9] Alwan S, Chambers CD, Armenti VT, Sadovnick AD. The need for a disease-specific prospective pregnancy registry for multiple sclerosis (MS). Mult Scler Relat Disord 2015; 4: 6-17.
[10] van Baaren GJ, Peelen MJ, Schuit E, van der Post JA, Mol BW, Kok M, Hajenius PJ. Preterm birth in singleton and multiple pregnancies: evaluation of costs and perinatal outcomes. Eur J Obstet Gynecol Reprod Biol 2015; 186: 34-41.
[11] Murray SR, Norman JE. Multiple pregnancies following assisted reproductive technologies-A happy consequence or double trouble? Semin Fetal Neonatal Med 2014; 19: 222-227.
[12] Gagnon A, Audibert F. Prenatal screening and diagnosis of aneuploidy in multiple pregnancies. Best Pract Res Clin Obstet Gynaecol 2014; 28: 285-294.
[13] Ogilvie CM. Multiple pregnancy, fetal reduction and selective termination. Reprod Biomed Online 2013; 26: 522-524.
[14] Tiitinen A. Prevention of multiple pregnancies in infertility treatment. Best Pract Res Clin Obstet Gynaecol 2012; 26: 829-840.
[15] D'Antonio F, Bhide A. Early pregnancy assessment in multiple pregnancies. Best Pract Res Clin Obstet Gynaecol 2014; 28: 201-214.
[16] Dickey RP. Strategies to reduce multiple pregnancies due to ovulation stimulation. Fertil Steril 2009; 91: 1-17.
[17] Black M, Bhattacharya S. Epidemiology of multiple pregnancy and the effect of assisted conception. Semin Fetal Neonatal Med 2010; 15: 306-312.
[18] Liang Y. Satisfaction with economic and social rights and quality of life in a post-disaster zone in China: evidence from earthquake-prone Sichuan. Disaster Med Public Health Prep 2015; 9: 111.
[19] Liang Y, Lu P. Medical insurance policy organized by Chinese government and the health inequity of the elderly: longitudinal comparison based on effect of New Cooperative Medical Scheme on health of rural elderly in 22 provinces and cities. Int J Equity Health 2014; 13: 1.
[20] Liang Y, Wang X. Developing a new perspective to study the health of survivors of Sichuan earthquakes in China: a study on the effect of post-earthquake rescue policies on survivors' health-related quality of life. Health Res Policy Syst 2013; 11: 1.
[21] Liang Y, Chu PH, Wang XK. Health-Related Quality of Life of Chinese Earthquake Survivors: A Case Study of Five Hard-Hit Disaster Counties in Sichuan. Social Indicators Research 2014; 119: 943.
[22] Liang Y, Wu W. Exploratory analysis of health-related quality of life among the empty-nest elderly in rural China: An empirical study in three economically developed cities in eastern China. Health Qual Life Outcomes 2014; 12: 1.
[23] Liang Y, Lu WY, Wu W. Are social security policies for Chinese landless farmers really effective on health in the process of Chinese rapid urbanization? a study on the effect of social security policies for Chinese landless farmers on their health-related quality of life. Int J Equity Health 2014; 13: 1.