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## The effects of multiple gestation and selective reduction on fetal outcome

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### Abstract

A group of 32 women with at least 3 or more viable fetuses by sonography at approximately 8 weeks gestation were given the option of selective reduction. They were advised that this was a relatively new procedure but heretofore in a small series was not associated with a significant increase in fetal demise. Only 7 of 32 women chose this option. Six of these 7 had triplets reduced to twins, 1 woman had quadruplets reduced to twins. Thirteen of 14 viable babies were successfully delivered at a mean of 36.8 weeks gestation; 2 of 7 (28.6%) delivered before 37 weeks. In contrast, 7 of 25 (24%) not having reduction lost

all babies (6 triplets, 1 quadruplet). Four other women lost at least 1 of their gestations (total of 5 babies). Pre-term deliveries (< 37 weeks) occurred in 16 of 18 (88.8%) patients delivering at least 1 live baby, with a mean of 33.7 weeks gestation. Thus the high rate of total fetal loss and prematurity for multiple gestation and the low pregnancy wastage and pre-term delivery rate following selective reduction might make the latter a reasonable therapeutic option to patients interested in having the best chance of delivering healthy viable babies.

**Keywords:** Fetal morbidity, fetal mortality, multiple gestation, preterm delivery, selective reduction.

### 1 Introduction

There have been several techniques used to achieve selective reduction of multifetal pregnancies including air insufflation [6, 7, 8], transcervical aspiration [3], fetal exsanguination [1], hysterotomy [4], and pericardial injection of potassium chloride [9].

There is still debate concerning the ethics and morality of performing selective reduction. BERKOWITZ et al suggested that the procedure should be performed on women with four or more fetuses [2]. Some clinicians have demonstrated that there has been a significant reduction in the perinatal mortality rates related to modern perinatal and neonatal technology [5], and therefore may not believe the procedure is needed until at least quadruplets are attained.

The study presented herein was designated to evaluate three things: 1) After discussing pros and cons of selective reduction in women with triplets or higher order multiple gestations what percentage will choose this procedure? 2) What is the outcome (fetal mortality or morbidity) of the remaining fetuses after selective reduction? and 3) What is the fetal outcome of those not choosing selective reduction?

### 2 Materials and methods

Thirty-two women with triplets or higher order multiple gestations were offered selective re-

duction. There was 29 with triplets and 3 with quadruplets. There were 30 women with multiple gestations who conceived with human menopausal gonadotropins, 2 with clomiphene citrate. There were 25 natural pregnancies and 6 were from in vitro fertilization embryo transfer and 1 was from transfer of donor oocytes (so the donor received the hMG).

All procedures were performed between 9 and 13 weeks after the last menstrual period. Real-time ultrasound scanning was done to identify fetal position and to evaluate growth. If all fetuses had similar crown to rump lengths, the one in the most technically accessible position was chosen. Any fetus overlying the cervix was excluded to avoid the risk of ascending infection.

The multifetal reductions were carried out by the maternal-fetal medicine department of Thomas Jefferson University, Philadelphia, Pennsylvania [9]. A 22 G spinal needle was guided by means of ultrasound into the pericardial region of the fetus; 0.2–0.5 mL volumes of sterile potassium chloride solution (2 mol/l) were then injected until cardiac activity ceased. Between 0.2 mL and 1.8 mL of the potassium solution was required. Once ultrasound visualization of the heart had confirmed asystole for at least two minutes, the needle was moved into the amniotic sac and 10–15 mL amniotic fluid was obtained. If other fe-

tuses were to be injected, they were identified and the procedure repeated. The fetal heart was evaluated 30 minutes later by repeat sonography; if cardiac activity was identified in a previously injected fetus, the injection procedure was repeated the same day. No prophylactic antibiotics or tocolytics were used.

### 3 Results

A group of 32 women with at least a triplet or higher gestation determined sonographically at approximately eight weeks were offered the option of selective reduction and were explained the pros and cons. Only 7 of the 32 (21.8%) chose this option.

Six patients had triplets reduced to twins and one woman had quadruplets reduced to twins. Thirteen viable babies of the potential 14 (92.8%) of these women were delivered. The mean gestational age was 36.8 weeks; only 2 of 7 (28.6) delivered before 37 weeks (35 and 36 weeks respectively). Thus all 7 women had at least 1 viable baby born and surviving one month.

In contrast, 7 of 25 (24%) choosing not to have selective reduction failed to have any babies survive even two days; 6 women lost all 3 triplets and there was demise of quadruplets in another woman. Four other women lost at least 1 of their gestations (1 triplet self reduced to a singleton).

Pre-term deliveries < 37 weeks occurred in 16 of 18 (88.8%) patients not having selective reduction; 1 of these women delivered < 32 weeks and 1 at 32 weeks. The mean number of weeks gestation for this group was 33.7.

The numbers were still too small to show statistical differences in the category of women not having any live children as a complication. Comparing prematurity rates the difference between 2 of 7 with selective reduction versus 16 of 18 opting not to have the procedure was highly significant ( $p < 0.006$ ) using Chi-square analysis.

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### 4 Discussion

If one considers total percentage of live babies born, there were 13 of 22 (59.1%) in those choosing multifetal reduction and 49 of 76 (64.4%) in those rejecting this procedure.

However, all seven choosing selective reduction had a successful pregnancy but 24% not undergoing the technique failed to take home a live baby. Furthermore, there is at least the potential risk for other complications in the latter group related to a higher rate of pre-term delivery.

The data presented herein does not share the optimistic concept of safety of triplets now with modern science expressed by NEWMAN et al [5]. All of our multiple gestations were treated by perinatologists. If one evaluates NEWMAN's data the average gestational age at birth was 33.6 weeks (almost identical to our 33.7 weeks) and 44.4% of their mothers required hospital admission prior to delivery.

From an ethical standpoint, our group is a reproductive endocrinology/infertility group and we have a negative attitude toward therapeutic abortion. However, since multifetal reduction enables approximately one fourth of the women with high order multiple gestation to produce a viable baby that they otherwise would not have had, and with less risk of complications from pre-term labor, we share a positive attitude for the procedure. We believe that the decision should rest with the couple after being provided data such as presented in this manuscript, and whatever the decision made, we as treating physicians should be supportive.

### 5 Conclusion

The majority of women with high order multiple gestations opt not to choose selective reduction. Those choosing this technique have a better chance of delivering at least one viable baby. Also, there is less risk of prematurity.