

Perinatal Outcome of Multiple Pregnancy: In Vitro Fertilization versus Spontaneous Pregnancy

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Objective: To compare the perinatal outcome of the In vitro fertilization of multiple pregnancies with those who conceived spontaneously.

Study design: Retrospective analysis of two groups of patients, those who conceived after IVF (n=39) and spontaneously (n=85) during the period between January 1995 and December 1996.

Obstetric measures: Intrauterine growth retardation, pre-term rupture of membranes, pre-term labour, caesarean section and perinatal mortality.

Results: The analysis of the data did not show any significant difference in the pregnancy complications between the two group of patients as far as hypertension, diabetes, abruptio placenta and intra-uterine growth retardation were concerned. The premature rupture of membranes was more in the spontaneous group. In the IVF group the rate of cesarean section and low birth weight was more than in the spontaneous group.

Conclusion: The risk of adverse perinatal outcome does not seem to be increased in the IVF group when compared with the spontaneous pregnancies.

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Since the birth of Louise Brown in 1978¹, the first child produced by in vitro fertilization (IVF), several thousand births have taken place throughout the world. The use of ovulation inducing agents has substantially increased the incidence of multiple pregnancies which account for 20-25% of IVF pregnancies². As the number of multiple fetuses increases, so does the incidence of total complications and the possibility of adverse outcome³.

Most of the reports have come from the USA and Europe, but the outcome of these cases from other areas has not been extensively documented. Hence, we have compared the outcome for baby and mother of multiple pregnancies resulting from

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IVF with that of spontaneous multiple conception delivered in Kuwait between January 1995 and December 1996.

METHOD

We studied retrospectively all multiple pregnancies managed and delivered at the maternity hospital in Kuwait between January 1995 and December 1996. This is one of the main four maternity hospitals in Kuwait serving a population of 500,000 in Kuwait city only and having 16,000 deliveries per year.

Obstetrics files were reviewed and data from multiple pregnancies was collected. Perinatal outcome was analysed and the following parameters were recorded : maternal age, parity, gestational age at delivery and mode of delivery.

Complications during pregnancy were also observed including hypertension, diabetes, abruptio placenta, intrauterine growth retardation, pre-term rupture of membranes and pre-term labour. The birth weight and neonatal outcome were also recorded. The perinatal outcome in spontaneous multiple pregnancies was compared with that in IVF multiple pregnancies.

Statistical Analysis:

Frequencies and means with standard deviations (SD) for independent variables were tabulated as appropriate. Associations between two categorical variables were estimated by Chi-square. Differences in means for continuous variables were tested using the Student t-test. Statistical significance was taken at a p-value <0.05. Statistical analyses were conducted with the statistical package for Social Sciences (SPSS-PC version 6.0.1) software.

RESULTS

Between January 1995 and December 1996, 124 multiple pregnancies were identified, of which 85 were spontaneous and 39 as a result of IVF. Details are shown in table 1, with the proportion of primiparous women being lower in the spontaneous group than in the IVF group which was statistically significant (P =0.001).

Table 1. **Maternal characteristics of IVF and spontaneous pregnancies.**

<i>Characteristics</i>	<i>IVF (n=39) (%)</i>	<i>Spontaneous (n=85) (%)</i>	<i>P</i>
Age in years (Mean ± S.D)	30.2 + 3.1	28.3 + 5.8	<0.05
Parity			
Primiparous	33(85)	19(23)	0.001
Multiparous	6(15)	65(77)	
Multiple pregnancies			
Twin	28(72)	83(98)	0.001
Triplets	9(23)	1(1)	
Quadruplets	2(5)	1(1)	

There was no difference in majority of the complications between the two groups of patients (Table 2), but premature rupture of the membranes occurred in 14 (17 %) patients in the spontaneous group compared with one patient (3%) in the IVF group (< 0.05) and this was statistically significant.

Table 2. **Obstetrics Complications**

<i>Complications</i>	<i>IVF Pregnancies</i>	<i>Spontaneous Pregnancies</i>	<i>P</i>
Hypertension	4(10%)	6(7%)	Ns*
Diabetes	1(3%)	1(3%)	Ns*
Abruptio placenta	1(3%)	3(4%)	Ns*
Intrauterine growth retardation	1(3%)	6(7%)	Ns*
Premature rupture of membranes	1(3%)	14(17%)	<0.05
Pre-term delivery	27(69%)	45(53%)	Ns*

*Ns = Not Significant

There was a statistically significant difference in the cesarean section rate between the two groups, 33% and 94% in the spontaneous and IVF groups, respectively.

Table 3. **Mode of Delivery**

	<i>IVF pregnancies (n=39)</i>	<i>Spontaneous pregnancies (n=85)</i>	<i>P</i>
Spontaneous	2(5%)	56(66%)	<0.01
Cesarean	37(95%)	28(33%)	<0.01

All the triplets and quadruplets were delivered by cesarean section without an attempt at vaginal delivery. In the spontaneous group 28 patients out of 83 twin pregnancies had cesarean section, while 37 out of 39 twin pregnancies had cesarean in the IVF group (Table 3).

Low birth weight in the spontaneous pregnancy group was less (39%) as compared to the IVF group (57%) and this was statistically significant (P<0.01) (Table 4).

Table 4. **Birth Weight of newborn babies in IVF and Spontaneous Pregnancies**

<i>Birth weight (gram)</i>	<i>IVF Pregnancies (n=90)</i>	<i>Spontaneous Pregnancies (n=173)</i>	<i>P</i>
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<1500	14(15 %)	31(18%)	0.01
1500-2500 grams	52(57%)	67(39%)	
>2500grams	25 (27.5%)	75(43.%)	

There were 5 perinatal deaths in the spontaneous group compared with two perinatal deaths in the IVF group.

DISCUSSION

Multiple pregnancies occur in 20-25% of all on going IVF pregnancies⁵. The high rate of multiple pregnancies is probably responsible for the high rate of complications observed in IVF pregnancies⁶.

The most important outcome to the patients is the probability of bringing home a healthy baby. Therefore, it is important to determine whether the obstetric outcome in IVF pregnancies carries increased risks for the mother and baby.

It is always difficult to compare the obstetric outcome of international studies due to complications which can vary according to different population characteristics and obstetric management.

In this study the IVF patients were older than patients with spontaneous pregnancies, however this difference was not significant. In a study by Olivenne et al there was a significantly higher maternal age in the IVF group⁷.

As expected, IVF patients were more often primiparous as compared with spontaneous pregnancies and this was statistically significant in this study (P<0.001).

Pregnancy complications like hypertension, diabetes, abruptio placenta and intrauterine growth retardation were not different in our study in both groups IVF and spontaneous pregnancies.

In this study, premature rupture of membranes occurred more frequently and statistically more significantly in the spontaneous group (P<0.05). Seoud et al found a similar rate of premature rupture of membranes⁸. It is difficult to explain this difference, perhaps it may be due to better follow up during the antenatal care in the IVF groups.

The high rate of premature deliveries in the IVF group (69.2%) is comparable to that in spontaneous group (52.9%). Similar findings were also observed in other studies⁹.

The increase in low birth weight babies in the IVF group was most likely due to the increase in the number of triplets and quadruplets. There were ten triplets and quadruplets weighing less than 1500 gm in the IVF group, while the mean weight of the triplet and quadruplet in the spontaneous group was 1800 and 1300 grams respectively.

The high rate of cesarean section in the IVF group compared to the spontaneous group observed in this study was also found in other studies⁸. The majority were

probably performed because of anxiety surrounding the management of these pregnancies. The long duration of infertility, the age of the patients and their considerable difficulty in achieving pregnancy would probably influence the decision of the mode of delivery.

Larger series are necessary, of course, to confirm these data. Multi centre studies probably would be necessary to study larger number of IVF pregnancies, but the inter centre variation in the management of the pregnancies could interfere with the observations.

CONCLUSION

The majority of IVF pregnancies have a satisfactory obstetric outcome. However, there are a number of increased obstetric risks that may reflect the history of infertility and the lower threshold for obstetric intervention in the IVF group of patients.

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