

Original Article

Obstetric management after infertility treatment

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Abstract

Objective: King Fahd University Hospital, Al-Khobar is a tertiary care center without the facility for *in-vitro* fertilization (IVF) and embryo transfer, but ovulation induction (OI) is done routinely. The objective of this analysis was to study the obstetric outcome of patients who conceived after IVF and OI.

Design: Retrospective analysis.

Patients and Methods: One hundred and twenty patients were analysed within the study period of January 1996 and December 2006. Patients were divided into two groups viz; those who became pregnant after IVF and embryo transfer and those who conceived after OI. The obstetric outcome measures analysed include: antenatal and intrapartum complications, the number of babies delivered and the mode of delivery. The data was entered into the database and analysed using SPSS Inc. version 14.

Results: The average age was 37.31 ± 4.1 years (range 21–43 years), primary infertility was seen in 74 women and secondary infertility in 46 patients. In 73 (60.8%) of the women, pregnancy occurred after OI and the rest of the patients underwent IVF at other centers. Sixty-nine (57.5%) of women had no previous pregnancy. Antenatal complications were similar in both groups but intrapartum complications were significantly higher in IVF group, $P = 0.05$. Multiple pregnancies were significantly higher in the IVF group ($P = 0.001$). Normal vaginal deliveries (NVD) were common in the OI group, and cesarean sections (CS) was significantly higher in IVF group ($P = 0.001$).

Conclusion: This study shows that in pregnancy after IVF and embryo transfer, intrapartum complications were more and CS was the common mode of delivery when compared with those that had only OI.

Key words: *In vitro* fertilization, obstetric outcome, ovulation induction.

Résumé

Objectif: Roi Fahd CHU, Al-Khobar est un centre de soins tertiaires sans la facilité pour la fécondation *in vitro* (FIV) et le transfert d'embryon, mais l'induction de l'ovulation (OI) est effectuée régulièrement. L'objectif de cette analyse était d'étudier l'obstétrique issue de patients ayant conçu après la FIV et OI.

Design: Analyse rétrospective.

Patients and Methods: Cent vingt patients ont été analysés dans la période d'étude de janvier 1996 et décembre 2006. Patients étaient divisés en deux groupes viz ; ceux qui devient enceinte après la FIV et d'embryons de transfert et ceux qui ont conçu après OI. Les mesures de résultat obstétriques analysés comprennent : les complications antenatal et des enfants, le nombre de bébés livrées et le mode de livraison. Les données a été entrées dans la base de données et analysés à l'aide de SPSS Inc. version 14.

Résultats: L'âge moyen était ± 37.31 ans 4.1 (gamme 21–43 ans), infertilité principale a été vu dans 74 femmes et infertilité secondaire chez les 46 patients. Dans 73 (60,8%) des femmes, grossesse s'est produite après OI et le reste des patients ont subi la FIV à d'autres centres. ?Soixante-neuf (57,5%) des femmes n'avait aucune grossesse précédente. Complications prénatales étaient similaires dans les deux groupes mais complications enfants étaient considérablement plus élevées dans le groupe de FIV, $P = 0,05$. Grossesses multiples ont été considérablement plus élevés dans le groupe de FIV ($P = 0,001$). Livraisons vaginales normales (NVD) étaient courantes dans le groupe OI et sections de césarienne (CS) a été considérablement plus élevé dans le groupe de FIV ($P = 0,001$).

Conclusion: This study shows that in pregnancy after IVF and embryo transfer, intrapartum complications were more and CS was the common mode of delivery when compared with those that had only OI.

Mots-clés: *In vitro* fertilization, obstetric outcome, ovulation induction.

Introduction

In the eastern province of Saudi Arabia with a population of 6 million people, only three private hospitals have facilities for *in-vitro* fertilization (IVF) and embryo transfer, hence there is limited literature from the area on the aspect of IVF and ovulation induction (OI). Risk of complications after IVF and OI are many folds higher than in normal conception.^[1-5] Since the Saudi population characteristics are changing and there is a high percentage of younger population, pregnancies due to IVF and OI are bound to increase in near future. It is paramount that an assessment is made on the obstetric and neonatal outcomes of pregnancies due to such procedures. Moreover, there is little data in literature that has compared obstetric management and outcome after IVF and OI. We believe this analysis will serve as a guide to obstetricians that manage pregnancies resulting from IVF and OI as a result of infertility treatment. Hence we carried out this study to assess the obstetric outcome of pregnancies due to IVF and OI seen at King Fahd University Hospital, Al-Khobar, Saudi Arabia.

Patients and Methods

One hundred and twenty patients were analysed within the study period of January 1997 to December 2007. Patients were divided into two groups viz; those who became pregnant after IVF and embryo transfer and those who had OI. Only deliveries of gestation of ≥ 24 weeks were included in the analysis. Data retrieved included age of the patient, parity, infertility either primary or secondary, method of conception, prenatal complications, gestational age, intrapartum and postpartum complications. Modes of delivery, Apgar scores and weight of the babies were noted. The prenatal complications that were compared were gestational diabetes mellitus (GDM), pregnancy induced hypertension (PIH), oligo and polyhydramnios, premature rupture of membranes, pre-eclampsia and intrauterine growth restriction (IUGR). A glucose tolerance test was performed before confirming GDM and three blood pressure readings at different times of $\geq 140/90$ mm Hg after 20 weeks of gestation was labeled as PIH.

All the data was entered into the database and analysed using SPSS Inc. version 14. The χ^2 -test or Fisher's Exact test was used for categorical variables, and students YES (Chi-square).

t-test was used for continuous variables. Odds ratio (OR) at 95% confidence interval (CI) were computed, and *P*-value of <0.05 was considered to be statistically significant. The study was approved

by the research committee of College of Medicine, King Faisal University, Dammam and King Fahd University Hospital, Al-Khobar.

Results

The average age was 37.31 ± 4.1 years (range 21–43 years). The mean age of patients in the IVF group was 30.15 ± 4.46 and the OI group was 31.0 ± 5.32 years. Primary infertility was seen in 74 women and secondary infertility in 46 patients. The duration of infertility was higher in the IVF group as compared to OI group but was not statistically significant [Table 1]. In 73 (60.8%) women, pregnancy occurred after OI and rest of the patients underwent IVF at Other centers. In the IVF group, in 63.8% it was the first pregnancy whereas in the OI group it was 38% ($P = 0.001$ (OR < 0.168 , CI 95%). Antenatal complications were similar in both groups and intrapartum complications were significantly higher in IVF group $P = 0.05$ (OR < 1.69 , CI 95%) [Table 2]. In the IVF group, pregnancy-induced hypertension was observed in 6.3% compared to 2.7% in the OI group. Multiple pregnancies were significantly higher in the IVF group ($P = 0.01$ (OR < 0.84 , CI 95%). Normal vaginal deliveries (NVD) were common in the OI group and cesarean section (CS) was significantly more in the IVF group ($P = 0.001$ (OR < 30.43 , CI 95%). In the OI group, 5.4% of the children were born between 24 and 28 weeks compared to 12.7% in the IVF group [Table 3]. The average birth weight of newborns in the OI group was significantly higher than the IVF group (2754 vs. 2359 g).

Discussion

Our study compared the obstetric and neonatal characteristics and outcome of women who had conceived after IVF with those who had OI. Other

Table 1: Demographic data of patients of both groups

Parameters	<i>In Vitro</i> fertilization group	Ovulation induction Group	<i>P</i> Value
Number of patients	47	73	
Age in years	30.15 \pm 4.46	31.0 \pm 5.32	0.1
Duration of infertility (years)	7.64 \pm 4.6	6.76 \pm 3.01	0.2
Parity	0.41 \pm 0.8	0.92 \pm 1.26	0.001 (OR <0.168)
Primary infertility	31	58	0.05 (OR <1.05)
Secondary infertility	16	15	0.05 (OR <1.147)

OR: Odds ratio

Table 2: Obstetrics data of patients

Parameters	In Vitro fertilization	Ovulation induction	P Value
Number of patients	47	73	
Singleton babies	33	64	0.05 (O.R.<7.69)
Multiple pregnancies	14	9	0.01 (O.R.<0.84)
Antenatal complications	12	20	0.1
Intra-partum complication	10	11	0.05 (O.R.<1.69)
Normal vaginal delivery	4	35	0.001 (O.R.<30.43)
Instrumental vaginal delivery	3	7	0.1
Cesarean section	40	31	0.001 (O.R.<19.57)

OR: Odds ratio

Table 3: Gestational and neonatal Data

Variable	IVF (%) cases	OI (%) of cases	P Value
Number of patients	47	73	
Delivery distribution (weeks)			
24-28	6 (12.7)	4 (5.4)	0.01
29-34	10 (21.3)	13 (17.8)	0.3
≥35	31 (66)	56 (76.8)	
Apgar score			
At 1 minute	7.4	7.9	0.4
Apgar score			
At 5 minute	8.9	9.5	0.3
Neonatal			
Birth Weight (Grams)	2359	2754	0.01

studies that compared between two groups had reported divergent results. Maman *et al.*^[6] reported age difference between patients who underwent IVF and OI. They reported that patients with OI were younger than those in the IVF group. In this study, we did not find any significant age difference between the two groups. WHY? Any possible explanation? Gestational diabetes is probably the first antenatal complication of any pregnancy. Among the antenatal complications, 12.8% in IVF group and 10.95% in the OI group developed GDM. This in comparison to the findings of Maman *et al.*^[6] is much lower, but higher than that reported by Reubinoff *et al.*^[7] of 6.2% in their IVF group. Recently, Caserta *et al.*^[8] reported no difference between the prevalence of gestational diabetes among the IVF and naturally conceived women. Pregnancy-induced hypertension (PIH) was significantly more frequent in women who became pregnant after assisted reproduction.^[9,10]

Intrapartum complications like placenta previa and placental abruption are known complications in assisted reproductive technology as compared to

pregnancy due to normal conception.^[11-13] Jackson *et al.*^[14] after a meta-analysis suggested that there is a three-fold higher risk of placenta previa after assisted fertilization. Romundstad *et al.*^[15] reported a prevalence of 1.59% of placenta previa in patients who conceived after assisted fertilization and suggested that that the increased risk may be caused by factors related to the reproductive technology. Isaksson *et al.*^[10] reported placenta previa was not significantly different in the control group and IVF, whereas placental abruption was more common in the assisted reproduction group.

In our series, one patient had placenta previa in the OI group and none in the IVF group, indicating the incidence of placenta previa in patients with assisted fertilization is becoming comparatively similar to its occurrence in women who become pregnant after normal conception.

Pregnancies conceived after assisted reproduction is always considered precious, hence, obstetricians avoid taking chances with the mode of delivery. Shunji and Hidehiko^[16] reported that the elective CS rate in pregnancies following IVF was significantly higher than that in the control group, whereas Maman *et al.*^[6] found significantly higher rate of CS in the IVF and OI groups compared to the normal conception. The CS rate was reported to be significantly higher among IVF patients 41.9% versus 15.5% in women with normal conception.^[7] In our patients, the CS rate was significantly more in the IVF group when compared to the OI group.

In conclusion our study indicates that in pregnancy after IVF and OI, antenatal complications were similar but intrapartum complications were higher in the IVF group. In OI patients NVD was the usual outcome whereas in patients with IVF, CS was the most common mode of delivery. Pregnancies achieved by IVF appear to carry higher risk for intrapartum obstetric complications and close surveillance during pregnancy and delivery should be considered.

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