

## Investigation of the Baby's Health in Pregnancies Resulting from ART and Natural Pregnancies

### Abstract

More than one million infants have been born using assisted reproductive technologies (ARTs) around the world. The proof and evidence indicate the prevalence of multiple pregnancies, low birth weight (LBW), prematurity, and congenital anomalies in them. This study aims to explore the baby's health in pregnancies resulting from assisted reproductive methods and natural pregnancies. The current research is a descriptive cross-sectional method. The sample volume of this study is 100 people of pregnant women who have given birth in Mahdiyeh hospital in Tehran; fifty of them are pregnant women who have been fertilized by ARTs, and others are naturally fertilized ones. The information was collected by SPSS software (version 22), evaluated by statistical tests, and considered a significant level ( $P < 0.05$ ). The results showed that the LBW, infant mortality, intrauterine fetal demise (IUFD), intrauterine growth restriction (IUGR), placental abruption, placenta previa, birth weight, and Apgar score at 1 minute after birth does not have a significant relation with the age, occupation, marital duration, infertility cause, infertility duration of the mother as well as the history of the ART use and childbirth type. But there is a significant relationship between infant mortality and infertility duration, and most of the infant mortality is seen in mothers with an infertility duration of fewer than five years. Infertility and its treatment with ARTs may affect the baby's weight, so in this group of patients, it should be considered to take care of pregnancy duration accurately.

**Keywords:** *Baby's Health, Infant Mortality, Natural Pregnancy, Artificial Insemination (AI), ART*

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### Introduction

Reproduction is one of the human abilities, but a few couples do not have this ability and are infertile. Infertility is an environmental, mental, and social outcome that causes a couple to be faced with a crisis (Hamid, 2009). Although the modern ARTs are not acceptable among a section of Iranian people, same as the population worldwide, and all infertile couples do not use these techniques due to the religious and cultural factors affecting their decisions on the treatment, statistics for the use of such methods are increasing in Iran (Zegers, 2008).

The babies resulting from the assisted reproductive treatments are those who have been created by ARTs in which semen is formed by the human's intervention. Based on the infertility cause of parents and the use of one of the treatment methods such as intrauterine insemination (IUI), in vitro fertilization (IVF), intracytoplasmic sperm injection (ICSI), surrogate mothers, and embryo donation, the infertile couple's children are born.

Most of the born children using ART are normal. However, the risks such as low growth in the infant period, congenital defects, and gastrointestinal disorders are higher in these babies. The prevalence rate of some maternal effects such as gestational diabetes, eclampsia, and preeclampsia as well as fetal and umbilical cord problems, are among the causes that are more prevalent in this group. Currently, several studies have evaluated the ART effect on the maternal and fetal effects

in the pregnancy period (Jacobsson, 2004). Among the 48 IVF pregnancies investigated prospectively, multiple pregnancies gradually lead to hypertensive disorders (Causio, 1995). Conversely, in a small prospective study including 90 consecutive pregnancies with the help of IVF compared to the non-IVF pregnancy, it was depicted that the IVF method was not associated with a higher prevalence of hypertension relative to the evidence group (Petersen, 1995).

In recent years, only 20% of multiple pregnancies have been induced by spontaneous fertilization, and the remaining 80% can be attributed to the pregnancy interventions, of which half are attributed to the ART and others to COH<sup>1</sup> in non-ART periods (Burke, 2007). The prevalence of multiple pregnancies after stimulating ovulation is solely or in combination with 20-40% of IVF. The risk of the treatment is the prematurity effect and, as a result, an increase in infant mortality rate (Tarlantzis, 2007). Also, ectopic pregnancies that are 2% prevalent in the general population reach 4% after the ART treatment. Ovarian hyperstimulation syndrome and increased risk of ovarian malignancies, etc., are the other effects of these treatments (Burke, 2007). The rate of abortion is higher after treating infertility as well (Kupka et al., 2003).

The evidence shows that the ART treatments for infertility predict the maternal and fetal effects in the pregnancy period, and the traditional intervening factors are very important determining factors that can decrease the magnitude of this positive relation (Lynch, 2002). Orazulike and Alegbeleye

<sup>1</sup> Controlled ovarian hyperstimulation

(2017) investigated the maternal and infant effects on Nigerian women who had become pregnant using ARTs. The results showed that ART pregnancies are associated with outcomes for mothers and fetuses compared to spontaneous pregnancies. Based on the findings, the rate of multiple pregnancies was 47% in the ART group had a significant difference ( $P = 0.001$ ) compared to the evidence group (6%). Korosec et al. (2014) compared the single pregnancies resulting from the IVF and embryo donation to the pregnancy results and infants' position in Slovenia and showed that the average birth weight of IVF infants is higher than embryo donation infants. The incidence rate of placenta praevia and bleeding during the third trimester of pregnancy was seen more in IVF, especially if two fetuses had been transferred (Korosec, 2014).

Tomic et al. (2011) investigated the infant outcomes of single pregnancies resulting from IVF against the single spontaneous pregnancies in 35-year women and older in Croatia. The results showed that the rate of cesarean delivery in the IVF group was higher than in the evidence group (9.39% against 1.25%,  $P < 0.001$ ). The rate of preterm delivery was higher in the IVF group as well (7.18% against 3.10%,  $P < 0.001$ ). But there was not any difference in perinatal mortality. Chen et al. (2009), in a retrospective study in infertility centers of Ontario in Canada, evaluated the relation between IUI-ICSI-OI<sup>2</sup> and IVF with the risk of preeclampsia. The results of this study showed that the pregnancy with IVF is associated with the risk of preeclampsia due to modulating the mother's age, smoking during the pregnancy, and caring for the perinatal in the first trimester. Suzuki and Miyake (2008), in a retrospective study in Japan, investigated the midwifery outcomes in 35-year nulliparous women and older compared to the ones less than 35 years, which led to the single pregnancy following IVF. Based on the results, the average age of the younger group is 31.9 years compared to 38.1 years. The results showed that the incidence of gestational hypertension in the age group less than 35 years was higher than in the 35-year group and older.

Shevell et al. (2005) evaluated the ART relation with increased adverse outcomes of the pregnancy. The results showed that there is not any relationship between ART, intrauterine aneuploidy growth retardation, and fetal anomalies after modulating the age, race, educational level, previous preterm delivery, body mass index (BMI), smoking history, and bleeding in the prior pregnancy. Koudstaal et al. (2000) examined the midwifery outcomes in the single pregnancies resulting from IVF in 4 university hospitals in the Netherlands. Based on the results, the vaginal bleeding occurred in the IVF group more during the pregnancy than in the control one

**Table 1:** The comparison of the average health components of the baby in the pregnancy with infertility treatment based on the mother's age.

(26.21% vs. 7.13%); the incidence of pregnancy hypertension in the IVF group was more than in the control one (7.13% vs. 1.11%). Barat et al. (2010) compared the results of twin-born infants by ART and spontaneous methods in Babol. Based on the results, the average pregnancy age did not have a significant difference in both groups. In the ART group, gestational diabetes ( $P = 0.04$ ), intrauterine growth retardation ( $P = 0.035$ ), and transfer to the neonatal intensive care unit (NICU) ( $P = 0.00$ ) were significantly more than the spontaneous group, but it was not seen a significant difference in premature rupture of membranes (PROM), preeclampsia, placental events, and placental abruption in both groups.

Ashrafi et al. (2007) compared the results of the single pregnancies with IVF/ICSI between 1999 and 2000 in 532 ones and showed the following differences:

Spontaneous abruption (19.09% in IVF and 16.42% in ICSI), ectopic pregnancy (1.2% IVF against of 0.9% ICSI), cesarean rate (46.9% ICSI against of 35.8% IVF), as well as LBW and preterm (5.1% ICSI/IVF vs. 6.4%, 5.4% vs. 5.5%, respectively).

Paying attention to the pregnancy importance is so crucial to retain the family foundation and create hope and happiness in the families of the infertile couple, especially in terms of cultural and religious contexts, and the Iranian population must be assured of this type of pregnancy. Is the babies' health resulting from this type of fertility equal to the babies' resulting naturally? Is it necessary to be considered the laws and specific ethical considerations regarding the use of these techniques?

## RESEARCH METHOD

The current research is a cross-sectional descriptive study that which the studied population has consisted of the couple files of women who have given birth in Mahdijeh hospital in Tehran; those who have become fertile using different ARTs compared to the natural fertile mothers. The sample volume of this study is 100 people of pregnant women who have given birth in Mahdijeh hospital in Tehran; fifty of them are pregnant women who have been fertilized by ARTs, and others are naturally fertilized ones. The minimum volume of the sample was obtained at 100 using Cochran's formula. The information was collected by SPSS software (version 22), evaluated by statistical tests, and considered a significant level ( $P < 0.05$ ).

## FINDINGS

According to the abnormal data, Kruskal-Wallis and Yu Mann-Whitney tests were used to compare the variables.

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<sup>2</sup> Ovulation Induction

	Mother's age	N	Baby's health			Chi-Square	df	p-value
			Mean	Std. Deviation	Mean Rank			
LBW	Less than 25 years	2	0.00	0.000	16.5	4.909	4	0.297
	26-30	3	0.67	0.577	33.17			
	31-35	19	0.32	0.478	24.39			
	36-40	19	0.47	0.513	28.34			
	More than 41 years	7	0.14	0.378	20.07			
Infant mortality	Less than 25 years	2	0.00	0.000	23.5	3.682	4	0.451
	26-30	3	0.33	0.577	31.83			
	31-35	19	0.05	0.229	24.82			
	36-40	19	0.11	0.315	26.13			
	More than 41 years	7	0.00	0.000	23.5			
IUFD	Less than 25 years	2	0.00	0.000	25	1.632	4	0.803
	26-30	3	0.00	0.000	25			
	31-35	19	0.00	0.000	25			
	36-40	19	0.05	0.229	26.32			
	More than 41 years	7	0.00	0.000	25			
IUGR	Less than 25 years	2	0.00	0.000	18.5	2.192	4	0.7
	26-30	3	0.33	0.577	26.83			
	31-35	19	0.26	0.452	25.08			
	36-40	19	0.37	0.496	27.71			
	More than 41 years	7	0.14	0.378	22.07			
Placental abruption	Less than 25 years	2	0.00	0.000	21.5	6.018	4	0.198
	26-30	3	0.00	0.000	21.5			
	31-35	19	0.11	0.315	24.13			
	36-40	19	0.32	0.478	29.39			
	More than 41 years	7	0.00	0.000	21.5			
Placenta previa	Less than 25 years	2	0.00	0.000	24	6.061	4	0.195
	26-30	3	0.33	0.577	32.33			
	31-35	19	0.00	0.000	24			
	36-40	19	0.05	0.229	25.32			
	More than 41 years	7	0.14	0.378	27.57			
Birth weight	Less than 25 years	2	2.50	0.707	35.25	2.887	4	0.577
	26-30	3	2.00	0.000	24			
	31-35	19	1.95	0.405	22.97			
	36-40	19	2.11	0.658	26.61			

	More than 41 years	7	2.14	0.378	27.21			
Apgar score at 1 minute after birth	Less than 25 years	2	2.00	0.000	25.5	1.289	4	0.863
	26-30	3	2.00	0.000	25.5			
	31-35	19	2.05	0.229	26.76			
	36-40	19	1.95	0.405	24.24			
	More than 41 years	7	2.00	0.000	25.5			

According to Table 1 and based on the Kruskal-Wallis test and Chi-Square statistics in the pregnant women with infertility treatment, LBW, infant mortality, IUFD, IUGR, placental

abruption, placenta previa, birth weight, and Apgar score at 1 minute after birth do not have a significant difference among the age groups ( $P$ -value > 0.05).

**Table 2:** The comparison of the average health components of the baby in the pregnancy with infertility treatment based on the mother's occupation.

	Mother's occupation	N	Baby's health			Mann-Whitney U	Wilcoxon W	Z	p-value
			Mean	Std. Deviation	Mean Rank				
LBW	Homemaker	36	0.36	0.487	25.53	251	356	-0.026	0.979
	Employed	14	0.36	0.497	25.43				
Infant mortality	Homemaker	36	0.11	0.319	26.28	224	329	-1.287	0.198
	Employed	14	0.00	0.000	23.5				
IUFD	Homemaker	36	0.00	0.000	25	234	900	-1.604	0.109
	Employed	14	0.07	0.267	26.79				
IUGR	Homemaker	36	0.31	0.467	26.14	229	334	-0.639	0.523
	Employed	14	0.21	0.426	23.86				
Placental abruption	Homemaker	36	0.17	0.387	25.67	246	351	-0.204	0.838
	Employed	14	0.14	0.363	25.07				
Placenta previa	Homemaker	36	0.06	0.232	25.39	248	914	-0.21	0.834
	Employed	14	0.07	0.267	25.79				
Birth weight	Homemaker	36	2.06	0.583	25.46	250.5	916.5	-0.042	0.966
	Employed	14	2.07	0.267	25.61				
Apgar score at 1 minute after birth	Homemaker	36	1.97	0.167	24.83	228	894	-1.102	0.27
	Employed	14	2.07	0.475	27.21				

According to Table 2 and based on the Yu Mann-Whitney test and Z statistic in the pregnant women with infertility treatment, LBW, infant mortality, IUFD, IUGR, placental abruption,

placenta previa, birth weight, and Apgar score at 1 minute after birth do not have a significant difference among the occupational groups ( $P$ -value > 0.05).

**Table 3:** The comparison of the average health components of the baby in the pregnancy with infertility treatment based on the marital duration.

	Marital duration	N	Baby's health			Mann-Whitney U	Wilcoxon W	Z	p-value
			Mean	Std. Deviation	Mean Rank				
LBW	Less than 5 years	21	0.43	0.507	27.21	268.5	703.5	-0.851	0.395
	More than 5 years	29	0.31	0.471	24.26				

Infant mortality	Less than 5 years	21	0.19	0.402	28.26	246.5	681.5	-2.426	0.015
	More than 5 years	29	0.00	0.000	23.5				
IUFD	Less than 5 years	21	0.05	0.218	26.19	290	725	-1.175	0.24
	More than 5 years	29	0.00	0.000	25				
IUGR	Less than 5 years	21	0.29	0.463	25.64	301.5	736.5	-0.076	0.94
	More than 5 years	29	0.28	0.455	25.4				
Placental abruption	Less than 5 years	21	0.00	0.000	21.5	220.5	451.5	-2.6	0.009
	More than 5 years	29	0.28	0.455	28.4				
Placenta previa	Less than 5 years	21	0.00	0.000	24	273	504	-1.505	0.132
	More than 5 years	29	0.10	0.310	26.59				
Birth weight	Less than 5 years	21	2.10	0.625	26.36	286.5	721.5	-0.461	0.645
	More than 5 years	29	2.03	0.421	24.88				
Apgar score at 1 minute after birth	Less than 5 years	21	1.95	0.218	24.36	280.5	511.5	-1.003	0.316
	More than 5 years	29	2.03	0.325	26.33				

According to Table 3 and based on the Yu Mann-Whitney test and Z statistic in the pregnant women with infertility treatment, LBW, infant mortality, IUFD, IUGR, placental abruption,

placenta previa, birth weight, and Apgar score at 1 minute after birth do not have a significant difference based on the marital duration ( $P$ -value > 0.05).

**Table 4:** The comparison of the average health components of the baby in the pregnancy with infertility treatment based on the infertility cause.

	Infertility cause	N	Baby's health			Chi-Square	df	p-value
			Mean	Std. Deviation	Mean Rank			
LBW	Primary male infertility	2	0.50	0.707	29	0.407	3	0.939
	Primary female infertility	39	0.36	0.486	25.47			
	Infertility in both	5	0.40	0.548	26.5			
	Secondary female infertility	4	0.25	0.500	22.75			
Infant mortality	Primary male infertility	2	0.00	0.000	23.5	1.202	3	0.753
	Primary female infertility	39	0.10	0.307	26.06			
	Infertility in both	5	0.00	0.000	23.5			

	Secondary female infertility	4	0.00	0.000	23.5			
IUFD	Primary male infertility	2	0.00	0.000	25	0.282	3	0.963
	Primary female infertility	39	0.03	0.160	25.64			
	Infertility in both	5	0.00	0.000	25			
	Secondary female infertility	4	0.00	0.000	25			
IUGR	Primary male infertility	2	0.50	0.707	31	0.944	3	0.815
	Primary female infertility	39	0.26	0.442	24.91			
	Infertility in both	5	0.40	0.548	28.5			
	Secondary female infertility	4	0.25	0.500	24.75			
Placental abruption	Primary male infertility	2	0.00	0.000	21.5	1.286	3	0.732
	Primary female infertility	39	0.18	0.389	25.99			
	Infertility in both	5	0.20	0.447	26.5			
	Secondary female infertility	4	0.00	0.000	21.5			
Placenta previa	Primary male infertility	2	0.00	0.000	24	0.882	3	0.83
	Primary female infertility	39	0.08	0.270	25.92			
	Infertility in both	5	0.00	0.000	24			
	Secondary female infertility	4	0.00	0.000	24			
Birth weight	Primary male infertility	2	2.50	0.707	35.25	2.301	3	0.512
	Primary female infertility	39	2.03	0.486	24.73			
	Infertility in both	5	2.00	0.707	24.3			
	Secondary female infertility	4	2.25	0.500	29.63			
Apgar score at 1 minute after birth	Primary male infertility	2	2.00	0.000	25.5	0	3	1
	Primary female infertility	39	2.00	0.229	25.5			
	Infertility in both	5	2.00	0.707	25.5			
	Secondary female infertility	4	2.00	0.000	25.5			

According to Table 4 and based on the Kruskal-Wallis test and Chi-Square statistics in the pregnant women with infertility treatment, LBW, infant mortality, IUFD, IUGR, placental abruption, placenta previa, birth weight, and Apgar score at 1

minute after birth do not have a significant difference based on the infertility cause ( $P$ -value > 0.05).

**Table 5:** The comparison of the average health components of the baby in the pregnancy with infertility treatment based on the infertility duration.

	Infertility duration	N	Baby's health			Mann-Whitney U	Wilcoxon W	Z	p-value
			Mean	Std. Deviation	Mean Rank				
LBW	Less than 5 years	14	0.43	0.514	27.21	228	894	-0.624	0.533
	More than 5 years	36	0.33	0.478	24.83				
Infant mortality	Less than 5 years	14	0.21	0.426	28.86	205	871	-2.161	0.031
	More than 5 years	36	0.03	0.167	24.19				
IUFD	Less than 5 years	14	0.07	0.267	26.79	234	900	-1.604	0.109
	More than 5 years	36	0.00	0.000	25				
IUGR	Less than 5 years	14	0.36	0.497	27.43	225	891	-0.75	0.453
	More than 5 years	36	0.25	0.439	24.75				
Placental abruption	Less than 5 years	14	0.00	0.000	21.5	196	301	-1.905	0.057
	More than 5 years	36	0.22	0.422	27.06				
Placenta previa	Less than 5 years	14	0.00	0.000	24	231	336	-1.103	0.27
	More than 5 years	36	0.08	0.280	26.08				
Birth weight	Less than 5 years	14	2.14	0.535	27.32	226.5	892.5	-0.717	0.473
	More than 5 years	36	2.03	0.506	24.79				
Apgar score at 1 minute after birth	Less than 5 years	14	1.93	0.267	23.79	228	333	-1.102	0.27
	More than 5 years	36	2.03	0.291	26.17				

According to Table 5 and based on the Yu Mann-Whitney test and Z statistic in the pregnant women with infertility treatment, LBW, IUFD, IUGR, placental abruption, placenta previa, birth weight, and Apgar score at 1 minute after birth do not have a

significant difference based on the infertility duration ( $P$ -value  $> 0.05$ ). But infant mortality has a significant difference based on the infertility duration ( $P$ -value  $< 0.05$ ).

**Table 6:** The comparison of the average health components of the baby in the pregnancy with infertility treatment based on the history of ART use.

	ART use	N	Baby's health			Chi-Square	df	p-value
			Mean	Std. Deviation	Mean Rank			
LBW	Lack of use	16	0.13	0.342	19.63	6.755	2	0.034
	ART use for men	33	0.45	0.506	27.86			

	ART use for men	1	1.00	0.000	41.5			
Infant mortality	Lack of use	16	0.06	0.250	25.06	0.203	2	0.904
	ART use for men	33	0.09	0.292	25.77			
	ART use for men	1	0.00	0.000	23.5			
IUFD	Lack of use	16	0.00	0.000	25	0.515	2	0.773
	ART use for men	33	0.03	0.174	25.76			
	ART use for men	1	0.00	0.000	25			
IUGR	Lack of use	16	0.06	0.250	20.06	7.321	2	0.026
	ART use for men	33	0.36	0.489	27.59			
	ART use for men	1	1.00	0.000	43.5			
Placental abruption	Lack of use	16	0.06	0.250	23.06	1.949	2	0.377
	ART use for men	33	0.21	0.415	26.8			
	ART use for men	1	0.00	0.000	21.5			
Placenta previa	Lack of use	16	0.06	0.250	25.56	0.065	2	0.968
	ART use for men	33	0.06	0.242	25.52			
	ART use for men	1	0.00	0.000	24			
Birth weight	Lack of use	16	2.13	0.342	26.81	0.33	2	0.848
	ART use for men	33	2.03	0.585	24.91			
	ART use for men	1	2.00	0.000	24			
Apgar score at 1 minute after birth	Lack of use	16	2.00	0.000	25.5	0	2	1
	ART use for men	33	2.00	0.354	25.5			
	ART use for men	1	2.00	0.000	25.5			

According to Table 6 and based on the Kruskal-Wallis test and Chi-Square statistics in the pregnant women with infertility treatment, infant mortality, IUFD, placental abruption, placenta previa, birth weight, and Apgar score at 1 minute after birth do not have a significant difference based on the infertility duration ( $P$ -value > 0.05).

But LBW and IUGR have a significant difference based on the history of the ART use ( $P$ -value < 0.05). So, it can be said that there is a significant relationship between the LBW and IUGR with the history of the ART use, and the highest LBW and IUGR are seen in mothers who have used the ART.

Table 7: The comparison of the average health components of the baby in the pregnancy with infertility treatment based on the childbirth type.

	Childbirth type	N	Baby's health			Mann-Whitney U	Wilcoxon W	Z	p-value
			Mean	Std. Deviation	Mean Rank				
LBW	Vaginal	12	0.33	0.492	24.83	220	298	-0.219	0.827
	Caesarean	38	0.37	0.489	25.71				
Infant mortality	Vaginal	12	0.08	0.289	25.58	227	968	-0.048	0.961
	Caesarean	38	0.08	0.273	25.47				
IUFD	Vaginal	12	0.00	0.000	25	222	300	-0.562	0.574
	Caesarean	38	0.03	0.162	25.66				
IUGR	Vaginal	12	0.25	0.452	24.75	219	297	-0.263	0.793
	Caesarean	38	0.29	0.460	25.74				
Placental abruption	Vaginal	12	0.08	0.289	23.58	205	283	-0.823	0.411
	Caesarean	38	0.18	0.393	26.11				
Placenta previa	Vaginal	12	0.00	0.000	24	210	288	-0.994	0.32
	Caesarean	38	0.08	0.273	25.97				
Birth weight	Vaginal	12	2.00	0.426	24.13	211.5	289.5	-0.488	0.626
	Caesarean	38	2.08	0.539	25.93				

Apgar score at 1 minute after birth	Vaginal	12	2.00	0.000	25.5	228	969	0	1
	Caesarean	38	2.00	0.329	25.5				

According to Table 7 and based on the Yu Mann-Whitney test and Z statistic in the pregnant women with infertility treatment, LBW, infant mortality, IUFD, IUGR, placental abruption, placenta previa, birth weight, and Apgar score at 1 minute after birth do not have a significant difference based on the childbirth type ( $P$ -value > 0.05).

#### DISCUSSION and conclusion

The results showed that in the babies who have born using infertility treatment, the LBW and IUGR had a significant difference based on the history of the ART use so that the highest LBW and IUGR were seen in mothers who had used the ART for women. But the infant mortality, IUFD, placental abruption, placenta previa, birth weight, and Apgar score at 1 minute after birth did not have different significance based on the history of the ART use. This finding is consistent with the research findings by Orazulike and Alegbeleye (2017), Ombelet et al. (2005), Koudstaal et al. (2000), Kaveh et al. (2015), Zafari et al. (2014), and Yasaiee et al. (2009).

According to the findings in the babies who have born using infertility treatment, all babies' health components did not have a significant difference based on the age, occupation, marital duration, infertility cause, and childbirth type. It seems that the difference in demographic and clinical characteristics of groups caused the results to differ. So, it is so important to investigate the effective factors and control the distorting factors such as age, parity, and infertility duration. Also, it is highly proposed about the long-run effects of these methods and more prospective studies. In our country, regardless of the common ART use, it has not been done many studies on the maternal and infant consequences of these techniques. Moreover, the studies based on the increase in fetal and infant effects such as congenital defects have been investigated in a few patients limiting the distorting factors of these investigations. The factors such as the infertility cause, previous treatments, number of treatment failures, and treatment duration are effective in the effects caused by infertility that are not controllable in the current study due to executive reasons.

The factors such as the infertility cause, previous treatments, number of treatment failures, and treatment duration are effective in the effects caused by infertility that are not controllable in the current study due to executive reasons. At last, according to the findings and research texts, it can be practically proposed that besides the advancement of infertility medical treatment, it is recommended to use periodic and regular psychological consulting services during the

pregnancy, especially for those who have been treated for infertility.

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#### Conflict of interest

None.

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#### Ethics Statement

All Permissions to conducting this research has been approved.

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