

Prelinguistic Behavior of Infants of Assisted Reproductive Techniques

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Abstract

Objective: The aim of this study is assessment of effects of different assisted reproductive techniques (ART) like in vitro fertilization (IVF) and intra cytoplasmic sperm injection (ICSI) on prelinguistic behavior of infants conceived by these techniques.

Methods: In this descriptive, cross sectional study, prelinguistic behavior of 151 full term ART infants of Royan Institute have been assessed in Children's Health and Development Research Center of Tehran from August 2007 until August 2009. Questionnaires were completed by parents at 9 months old. The questionnaire was standard according to Early Language Milestone Scale-2 (ELM-2). Data were analyzed by SPSS version 16 and using chi-square test.

Findings: Twenty-two (14.5%) of infants were conceived by IVF and 129 (85.4%) by ICSI. Number of infants with delay in reduplicated babbling in ICSI method was more than in IVF. There was only a significant difference in echolalia delay in the two sexes. Echolalia was delayed more in boys. Delay of reduplicated babbling was more in infants of younger mothers. There was no relation between speech and language defect of parents and infants.

Conclusion: This study showed that prelinguistic behavior of ART infants are affected by kind of ART method, infant sex, and mother's age at the time of pregnancy.

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Key Words: Linguistic; Behavior; Infants; In Vitro Fertilization; Assisted Reproductive Techniques

Introduction

Assessment of effects of different assisted reproductive techniques (ART) like in vitro fertilization (IVF) and intra cytoplasmic sperm injection (ICSI) on speech and language development needs comprehensive studies. One study showed that these children have a low risk of developing infantile autism^[1]. Some studies

showed that they are more susceptible to cerebral palsy which causes speech and language defects^[1].

Development of speech and language consists of four periods: prelinguistic, linguistic, school and adolescence period^[2].

The bases of learning how to speech is formed in prelinguistic period^[3]. Defects in prelinguistic behavior, i.e. physical defect like cleft palate,

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neurological defect like cerebral palsy or developmental defect like Down syndrome produce speech defects^[4].

In two studies in Belgium and Finland in infants of ART there was no difference between development of these children with infants of normal conception^[5,6].

In another study no differences in mental, motor, social and expressive language development were found, and while receptive language development was in the normal range, IVF infants scored lower than control infants^[7].

One study did not report any excess of neurodevelopmental disorders in IVF/ICSI children. The majority of studies followed the children during infancy, thereby precluding pertinent conclusion on the risk of neurodevelopmental disorders which express at older ages such as fine manipulation disability or dyslexia^[8].

One study shows that a large proportions of preterm deliveries in IVF children have increased risk of cerebral palsy^[9].

Regarding the importance of this subject and the lack of a comprehensive study on the prelinguistic behavior of infants of ART in Iran, this study was designed.

The aim of this study is to evaluate prelinguistic behavior of 9 month old ART infants of Royan Institute.

Subjects and Methods

In this descriptive, cross sectional study, 151 term infants of ART from Royan Institute have been evaluated in Children's Health and Development Research Center of Tehran from August 2007 until August 2009. The Research Ethics Committee of the Academic Center of Education, Culture and Research (ACECR) and Royan Institute approved the study. Infants were chosen by non-incident consecutive method.

The sampling method was non random sequential with the inclusion criteria of infants conceived through one of the ART methods

(IVF/ICSI), born in term and being resident in Tehran. Preterm born infants were excluded.

After signing of research consents by parents, prelinguistic behavior of 151 infants who were born full term (>37 weeks) are assessed. Questionnaires were completed by parents at 9 months old. The questionnaire was standard according to Early Language Milestone Scale-2 (ELM-2)^[10]. This scale is used for assessment of development of speech and language in children from birth to 3 years old. It has sensitivity of 90-95% for primary detection of speech, language and cognition defects.

The method of ART, sex of infants, age of mother at pregnancy, time and speech and language defect of parents at present and past time also were mentioned in questionnaire.

The prelinguistic behavior of infants include: crying at birth, different cries, smiling, cooing, babbling, reduplicated babbling and echolalia, which are assessed in this study.

Data were analyzed by SPSS version 16 and using chi-square test.

Findings

One-hundred one term infants of ART were evaluated. In this study, 76 (50.5%) were male and 75 (49.5 %) female. There was 129 (85.4%) of infants conceived by ICSI and 22 (14.5%) by IVF.

Prelinguistic behavior delay which had been assessed according to ELM-2 is shown in Table 1. These infants had no delay in crying at birth and different crying. Number of infants with delay in reduplicated babbling in ICSI method was more than un IVF.

The prelinguistic behavior delays in different sex and mothers' age is shown in Table 2. There was a significant difference only in echolalia delay in the two sexes. The echolalia delay was seen longer in boys.

Mothers of 118 infants were younger than 35 years and 33 ones were older. Delay in reduplicated babbling was more in infants of younger mothers.

Table 1: Prevalence of prelinguistic behavior delay in assisted reproductive techniques methods

Prelinguistic Behavior Delay	IVF	ICSI
Smiling	0	16 (12.4%)
Cooing	0	5 (3.8%)
Babbling	5 (22.7%)	16 (12.4%)
Reduplicated babbling	9 (40.9%)	30 (23.2%)
Echolalia	7 (31.8%)	15 (11.6%)

IVF: Invitro Fertilization; ICSI: Intra Cytoplasmic Sperm Injection

Speech and language defect of parents were seen in 16 (10.5%). Nine fathers (5.9%) and 4 (4.6%) mothers had these defects.

Discussion

Our study showed that ART infants have delay of reduplicated babbling and echolalia. Age of echolalia in boys was more delayed. Delay of reduplicated babbling was seen more in infants of younger mothers.

There are few studies about prelinguistic behavior of ART infants. Two studies showed that ART infants had normal cognition development [11,12]. Zhu JL in showed that infertility treatment, especially ICSI, may be associated with a slightly delayed cognitive language development [13]. Another study showed that there was no difference between cognitive development of infants of ART and normal infants [14].

In this study infants showed delay in reduplicated babbling and echolalia. In a study by Sutcliffe children were assessed with the Griffiths mental-development scales. ICSI children were around the midpoint for the Griffiths scales and did not differ significantly for Griffiths quotients and suhquotients [15].

One study reported significantly lower mental scores in 1 year old infants born after ICSI than in age matched infants born after IVF and naturally conceived infants. Stratification for gender revealed that lower mental development index scores were only found in boys, not in girls [16]. In our study delay of reduplicated babbling and echolalia were more in boys.

There is no study about effect of mother's age on speech and language development in infants. Bonduelle and his colleagues in their study, by selection of infants of mothers with the same age exclude affect of this variable [14]. In our study delay of reduplicated babbling was more in infants of younger mothers. There was no relation between speech and language defect of parents and prelinguistic behavior of infants.

Limited sample size, difficult access to this group of infants and unwillingness of parents to complete the questionnaires render less reliable results.

Conclusion

This study was a new study in our country which shows differences between ART infants in some prelinguistic behavior such as reduplicated

Table2: Prevalence of prelinguistic behavior delay in different sexes and mothers' age

Prelinguistic Behavior Delay	Sex		Mother's age	
	Boy	Girl	<35 year	>35 year
Smiling	11 (14.4%)	5 (6.6%)	12 (10.1%)	4 (12.1%)
Cooing	5 (6.5%)	0	4 (3.3%)	1 (3%)
Babbling	17 (22.3%)	4 (5.3%)	13 (11%)	8 (24.2%)
Reduplicated babbling	26 (34.2%)	13 (17.3%)	27 (22.8%)	12 (36.3%)
Echolalia	19 (25%)	3 (4%)	12 (10.1%)	10 (30.3%)

babbling and echolalia. This study showed that prelinguistic behavior of ART infants are affected by ART method, infants sex and mother's age at the time of pregnancy. Prelinguistic period has an important role in learning of speech. Detection and correction of any defect or delay in this period prevent major speech and language problems.

More studies with larger sample size to compare ART infants with infants of normal conception would be desirable.

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Conflict of Interest: None

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