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Assisted reproductive treatments resulting in twin pregnancies: A risk factor of offspring pediatric cardiovascular morbidity?

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Introduction

The literature regarding short-term implications of assisted reproductive treatment (ART) leading to twin pregnancies is controversial. Specifically, the long-term adverse effects in twins conceived by ART are not well studied. Therefore, we aimed to study the association between ART resulting in twin pregnancy and long- term cardiovascular morbidity of offspring.

Methods

A population-based retrospective cohort study including twins born between the years 1991-2021 at a tertiary medical center was conducted. Total and subtypes of cardiovascular morbidity among twins born following IVF (in vitro fertilization) versus OI (ovulation induction) and no ART were compared. A Kaplan-Meier survival curve was used to compare the cumulative incidence of cardiovascular morbidity, and a Cox proportional hazards model was constructed to adjust for confounders.

Results

The study population included 7790 twins; of them, 1380 (17.7%) were conceived by IVF treatment, 696 (8.9%) by OI and 5741 (73.7%) were conceived spontaneously. Comparable rates of different subtypes of cardiovascular morbidity were noted between three groups (Table). Likewise, the cumulative rates of long-term total cardiovascular morbidity were comparable among offspring in the three groups (Figure; Kaplan-Meier survival curve Log- rank p=0.483). Using a Cox proportional hazards model, controlling for maternal age, maternal diabetes and hypertension, ethnicity and gestational age at delivery, no significant association was demonstrated between ART and subsequent cardiovascular morbidity of the offspring (adjusted HR for IVF=0.93, 95% CI 0.61-1.41, p=0.725and adjusted HR for OI=0.95, 95% CI 0.56-1.62, p=0.852).

Conclusions

Twins conceived by ART are not at an increased risk for long-term pediatric cardiovascular morbidity

 Table – Long-term cardiovascular morbidity in

three groups

Cardiovascular	IVF	Ovulation	No ART	P value
morbidity	(n=1380)	induction(n=69	(n=5714)	
		6)		
Structural or	0% (0)	0% (0)	0.1% (7)	0.280
valvular disease				
Hypertension	0% (0)	0% (0)	0.2% (13)	0.094
Arrhythmia	1.2% (16)	1.1% (8)	1.0% (57)	0.830
Ischemic heart disease	0% (0)	0% (0)	0% (2)	0.695
Pulmonary heart disease	0.1% (1)	0% (0)	0.1%(4)	0.782
Pericarditis, myocarditis and endocarditis	0% (0)	0.1%(1)	0.3% (15)	0.144

Figure- A Kaplan-Meier cumulative hazard function of

total cardiovascular morbidity in three groups.



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