RATES OF MONOZYGOTIC TWINNING IN BLASTOCYST VERSUS CLEAVAGE EMBRYO TRANSFER CYCLES

Authors: Kaitlin Doody[1], MD, Kevin Doody, MD[2]

Affiliations: [1]USC Keck School of Medicine, Los Angeles, CA; [2]CARE Fertility, Bedford, TX

Background: Initial studies suggest that blastocyst culture results in monozygotic twinning at a rate of up to 5% of pregnancies.[1-3] The implications of this are substantial given the high obstetrical risk associated with monozygotic twin pregnancies.

Objective: The aim of this study is to assess a difference in rates of monozygotic twinning between blastocyst and cleavage embryo transfers using nation-wide registry data.

Materials and Methods:
A retrospective cohort study was performed using data obtained from the Society of Assisted Reproductive Technology (SART) National Clinic Summary Reports from 2014 to 2020. Filters were applied to identify the live birth rate, singleton birth rate, and twin birth rate for blastocyst (only day 5/6 transfers) and cleavage (day 5/6 transfers excluded). Only cycles that transferred a single embryo were included in the analysis. The proportion of twin live birth rate was determined by twin birth rate out of total live birth rate. Mann-Whitney U test was performed to assess for statistical difference ($p<0.01$) in proportion of twin live birth rates between blastocysts and cleavage transfer cycles.

Results:
Analysis using the Mann Whitney U test demonstrated no statistically significant difference in proportion of twin live births between blastocyst and cleavage embryo transfers in the following age groups: <35 ($p=0.79$), 35-37 ($p=0.03$), 38-40 ($p=0.03$), and 41-42 ($p=0.44$).

Proportion of Twin Births Out of Live Births in Single Embryo Transfers									
	Blastocyst					Cleavage			
Year	<35	35-37	38-40	41-42		<35	35-37	38-40	41-42
2020	1.5%	1.2%	1.2%	0.7%		2.0%	0.5%	1.9%	0.5%
2019	1.3%	1.2%	1.0%	0.7%		1.1%	0.4%	2.0%	2.2%
2018	1.1%	1.4%	1.2%	1.3%		2.6%	1.1%	1.5%	0%
2017	1.4%	1.2%	1.1%	1.2%		1.1%	1.0%	3.3%	2.2%
2016	1.6%	1.3%	1.5%	1.4%		1.8%	0.9%	3.7%	2.1%
2015	1.8%	2.0%	0.9%	1.9%		1.1%	2.0%	0.7%	4.9%
2014	1.6%	1.1%	0.7%	2.9%		0.8%	0.5%	1.8%	2.2%
Average	1.5%	1.3%	1.1%	1.4%		1.5%	0.8%	2.1%	1.9%

Conclusions:
There was no difference in proportion of live birth rates with twin live births between blastocyst and cleavage transfers from 2014 to 2020 in women aged <35, 35-37, 38-40, and 41-42.

References:
1. Behr, et al. Blastocyst-ET and monozygotic twinning. *J Assist Reprod Genet*. July 2000. 17(6):349-351. Doi: 10.1023/a:1009461213139.

2. Busnelli, et al. Risk factors for monozygotic twinning after in vitro fertilization: a systematic review and meta-analysis. *Fertility and Sterility*. February 2019. 111(2): 302-317. https://doi.org/10.1016/j.fertnstert.2018.10.025
3. Mateizel, et al. Do ARTs affect the incidence of monozygotic twinning? *Human Reproduction.* November 2016. 31(11): 2435-2441. https://doi.org/10.1093/humrep/dew216