

## **The pregnancy outcomes of a good morphology embryos transfer: a comparison between transfer of one euploid embryo versus two morphologically selected embryos**

**Objective:** To compare the transfer of an euploid embryo in relation to two thawed embryos not genetically tested and to correlate with gestational parameters per transfer.

**Methods:** A retrospective observational study was conducted with 383 patients recruited from a single clinical center. Data were obtained from thawed embryo transfers between January 2020 and December 2021.

Two groups of thawed embryo transfers were analyzed: Biopsy Group – patients who underwent transfer of 1 euploid blastocyst of good morphological quality [ $\geq 3BB$ , Gardner e Schoolcraft (1999)]; Control Group – patients who underwent transfer of 2 blastocysts of good morphological quality without genetic study ( $\geq 3BB$ ). Exclusion criteria were: oocyte recipient patients, change in the patient's or partner's karyotype previously detected that predisposes the couple to aneuploidy.

The clinical data of the patients were collected, as well as the follow-up of those who had a confirmed pregnancy and we evaluated gestational parameters such as: Implantation rate, chemical pregnancy rate ( $\beta$ -hCG  $> 40$ mIU/ml); Clinical pregnancy rate (confirmation of gestational sac on ultrasound); live birth rate ( $\geq 22$  weeks); chemical miscarriage rate ( $\beta$ -hCG  $> 40$ mIU/ml without visualization of gestational sac); Clinical miscarriage rate (pregnancy loss after visualization of gestational sac); and miscarriage rate per gestational sac.

**Results:** We identified that the Biopsy group has significantly lower values than the Control Group when comparing the chemical pregnancy rate (59% vs. 70%,  $p=0,0302$ ) and live birth rate (42% vs. 54%,  $p = 0,0405$ ). Implantation rate, clinical pregnancy, chemical and clinical miscarriage did not show statistical difference (not shown). Gestational parameters distinguished by patient age are shown in table 1.

Table 1. Pregnancy outcomes

	< 35 years			$\geq 35$ years		
	Biopsy(n=40)	Control(n=161)	p value	Biopsy(n=91)	Control(n=91)	p value
Implantation rate	53%	51%	0,8679	56%	38%**	<b>0,0064</b>
$\beta$ -hCG positive	23(58%)	124(77%)*	<b>0,0168</b>	54(59%)	53(58%)	1,0000
Chemical miscarriage	2(9%)	12(10%)	1,0000	3(6%)	1(2%)	0,6179
Clinical pregnancy	21(53%)	112(70%)	0,0607	51(56%)	52(57%)	1,0000
Clinical miscarriage	2(9%)	24(19%)	0,3706	15(28%)	5(9%)*	<b>0,0241</b>
Live birth rate	19(48%)	88(55%)	0,4802	36(40%)	47(52%)	0,1365

*\*P<0.05 was considered statistically significant*

When comparing abortions due to gestational sacs in the Biopsy group and the Control group with multiple pregnancies, no differences were found when evaluating all patients. Comparing miscarriages per gestational sacs in the Biopsy group versus the Control group with multiple pregnancies, no differences were found when evaluating all

patients (22% vs. 22%,  $p=1,000$ ), in patients <35 years (9% vs. 21%,  $p=0,3683$ ) and those aged  $\geq 35$  years (28% vs. 28%,  $p=1,0000$ )(not shown).

**Conclusion:** We observed that, when the objective is to have a baby at home, the transfer protocol of two good quality embryos still has an advantage in our clinical center in relation to the transfer of a single euploid embryo, resulting in higher rates of chemical pregnancy and live births. Although the transfer of two embryos provides a lower implantation rate in patients aged  $\geq 35$  years, this group has lower rates of clinical abortion, providing values of live births equivalent to the Biopsy group. High rates of multiple pregnancies are highlighted, however, the rates related to abortion do not seem to interfere when we transfer 2 embryos.

**Keywords:** frozen-thawed embryo transfer, preimplantation genetic testing, embryo morphology, miscarriage.