

# The science of Frozen Embryo Transfer, is modified natural cycle better?



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## INTRODUCTION

1207 frozen embryo transfer cycles performed in 2022 were retrospectively studied. Patients older than 40, with recurrent implantation failure, and recurrent pregnancy loss were excluded. Patients were divided according to their age, BMI, AMH, and type of embryo transfer protocol. Compared outcomes were endometrial thickness, pregnancy outcomes, miscarriage rate, number of clinic visits prior to transfer, and obstetrical outcomes.

## STUDY QUESTION

To compare pregnancy, obstetrical outcomes and number of visits between patient undergoing frozen embryo transfer in artificial cycle (AC) vs modified natural cycle (m-NC).

## METHODS

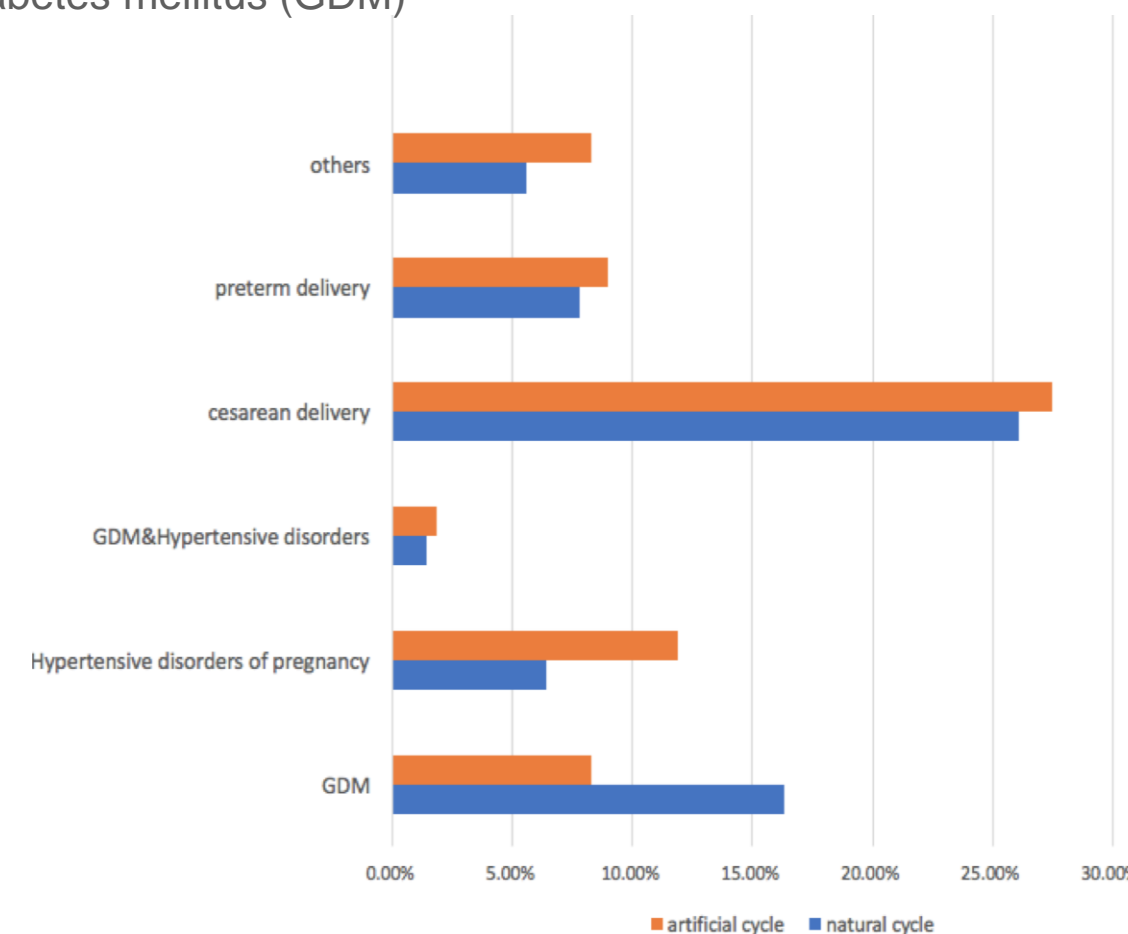
Patients in the modified natural cycle (m-NC) group were followed by ultrasound. When and when the endometrium reached a thickness  $\geq 7$ mm, and a dominant follicle  $\geq 15$ mm, HCG trigger was scheduled. Embryo (blastocyst) transfer occurred, and the embryo (blastocyst) transferred 7 days later. In the artificial cycle group (AC), patients received estrogen supplementation. When the endometrium reached a thickness  $\geq 7$  mm, embryo transfer was scheduled following 5 days of intramuscular progesterone administration for 5 days.

## RESULTS

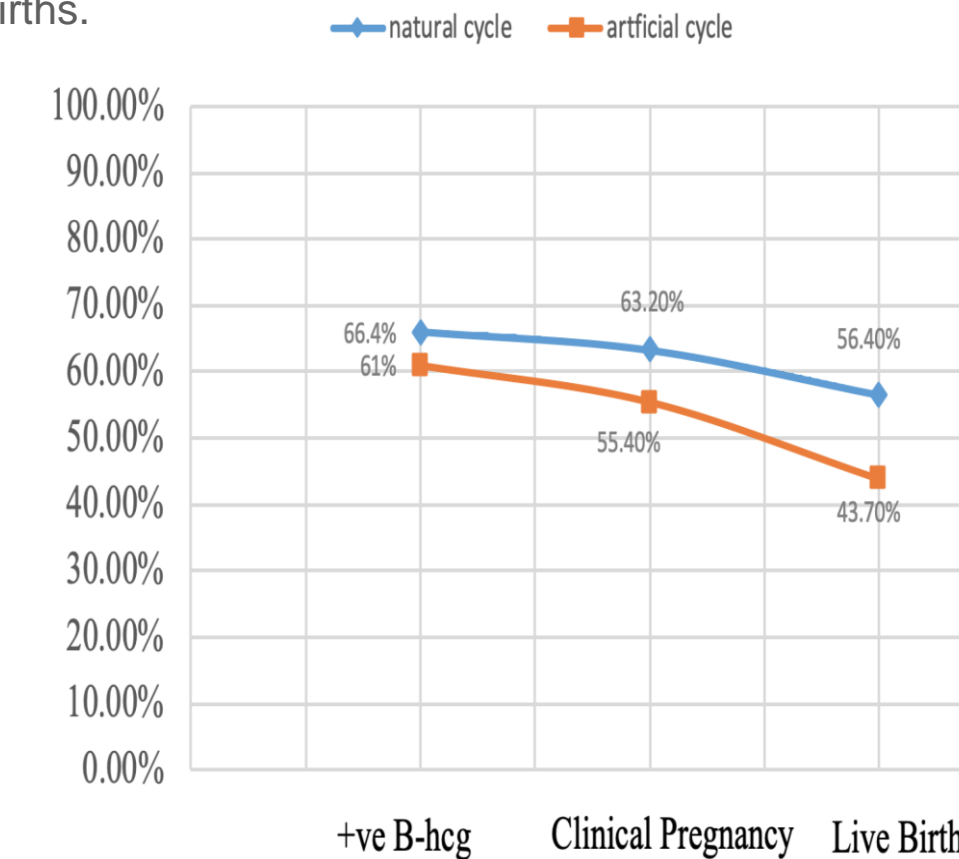
**Figure 1:** Baseline demographic and clinical characteristics according to the protocol used for endometrial preparation

Characteristics	m-NC (n=250)	AC (n=250)	p-value
Age (y), mean $\pm$ SD	33.99 $\pm$ 3.38	33.30 $\pm$ 3.56	0.029
Body-mass index (%)	25.12 $\pm$ 5.37	26.35 $\pm$ 5.82	0.067
AMH (ng/ml), mean $\pm$ SD	3.33 $\pm$ 2.13	4.39 $\pm$ 4.11	0.002
AFC, mean $\pm$ SD	22.6 $\pm$ 11.85	27.6 $\pm$ 18.20	0.000
Endometrial thickness (mm)	9.38 $\pm$ 1.99	9.58 $\pm$ 1.84	0.243
Timing of embryo transfer (%)			0.418
Day5	222 (88.8)	215 (86.0)	
Day6	28 (11.2)	35 (14.0)	
PGT-A n (%)			0.232
Yes	60 (24)	48 (19.2)	
No	190 (76)	202 (80.8)	
Number of visits, mean $\pm$ SD	1.57 $\pm$ 0.81	1.22 $\pm$ 0.54	0.000

**Figure 3.** Pregnancy complications and obstetrical outcomes according to type of endometrial preparation, gestational diabetes mellitus (GDM)



**Figure 2.** The effect of endometrial preparation protocol on percentage of positive B-hcg, Clinical Pregnancy, and Live Births.



**Figure 4.** The Odds of miscarriage in patients with bleeding and hematoma according to the type of endometrial preparation.

	Miscarriage N (%)	OR	CI (95%)	Sig.
Hematoma (N=27)	mNC (8) 3	0.9722	0.1762-5.3655	1.000
	AC (19) 7	reference		
Bleeding (N=30)	mNC (9) 1	1.882	0.1801-19.6774	1.000
	AC (21) 4	reference		

## DISCUSSION

250 patients were included in each group, patients in the m-NC group had insignificantly better pregnancy rate (p=0,264) and clinical pregnancy rate (= 0,084).

However, the live birth rate was, but significantly better live birth rate (p=0,006). The miscarriage rate was almost twice as high in the AC group. There was no difference in the mean endometrial thickness between the groups (9.38 in m-NC vs 9.59 in AC, p=0.243). The number of visits was higher in the m-NC group, but the difference was not clinically significant (1,57 days vs 1,2 days p=0,001). When comparing the obstetrical outcomes, patients with a m-NC transfer had a lower risk of hypertension (p= 0,176), but a significantly higher risk of gestational diabetes (p=0,038).

Regression analysis was performed and it was found that only the type of endometrial preparation was the sole player affecting live births (p= 0.0), with highest beta-coefficient for the m-NC group.

## CONCLUSION

Embryo transfer in m-NC yielded a higher live birth rate for the similar number of visits, less hypertension, but higher risks of gestational diabetes than the AC group.

