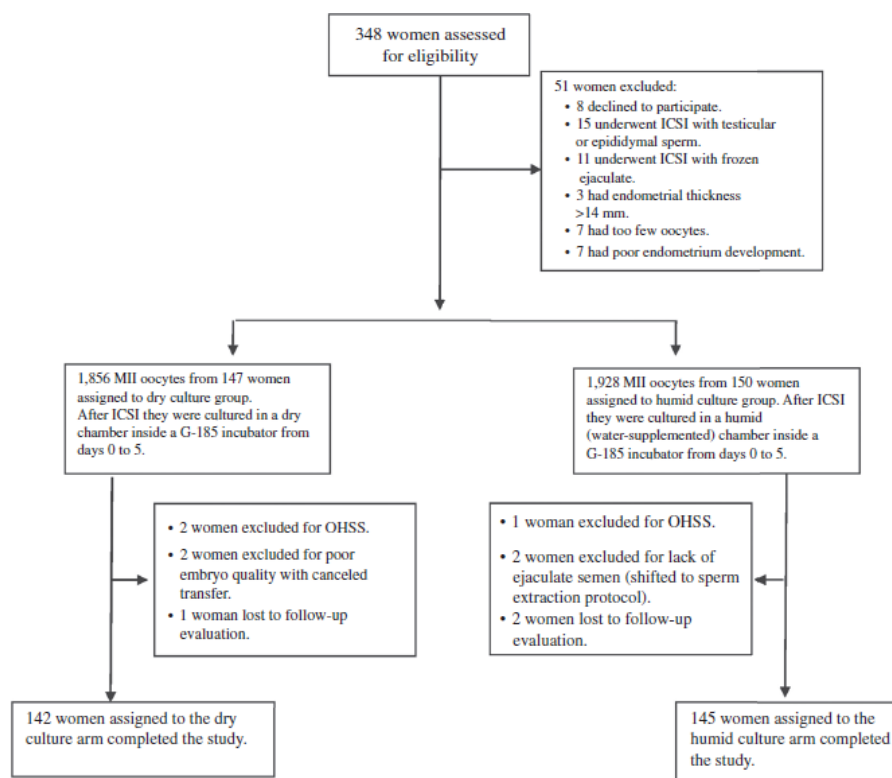


濕式與乾式培養對於胚胎成長及懷孕率的差異：一項前瞻性且隨機的試驗

目前市面上普遍使用乾式培養箱進行胚胎培養，優點在於較不易有微生物污染的問題，然而本文作者認為在母體內的環境其實是潮濕的，因此探討若是將乾式培養改成濕式培養是否能改變胚胎品質甚至是增加懷孕率？

FIGURE 1



Flowchart of eligible participants and allocation: dry culture versus humid culture. OHSS = ovarian hyperstimulation syndrome.

Fawzi. Humidity influences embryo development. *Fertil Steril* 2017.

本文利用前瞻性、雙盲且隨機的研究方式將 297 位不孕症婦女的胚胎隨機分配成濕式（在乾式培養箱內放含有水的培養盤）與乾式培養兩組（圖 1），並觀察胚胎從第 0 天（取卵當日）到第 5 或 6 天囊胚的生長情況，並在植入後追蹤其臨床懷孕率與繼續懷孕率等，結果發現在乾式環境培養的胚胎在植入後其臨床懷孕率與繼續懷孕率皆顯著比濕式培養的胚胎低（OR 0.57; 95% CI, 0.36-0.91; 與 OR 0.54; 95% CI, 0.34-0.85，表 3）。在胚胎培養的第三天也可以發現乾式培養的胚胎品質與緻密化程度顯著比濕式培養的胚胎低（OR 0.38; 95% CI, 0.32-0.45; 與 OR 0.23; 95% CI, 0.19-0.27），且在培養到第五天囊胚時也發現乾式培養的囊胚形成率（OR 0.39; 95% CI, 0.33-0.46）、囊胚品質（OR 0.34; 95% CI, 0.29-0.40）與冷凍保存率（OR 0.41; 95% CI, 0.35-0.48）皆顯著比濕式培養低（表 2），而納入條件的兩組婦女其基本條件並無太大差異（表 1）。

TABLE 1

Baseline characteristics by trial group: dry versus humid culture.

Characteristics	Dry culture (n = 147)	Humid culture (n = 150)	P value
Age (y)	28.48 ± 0.39	28.77 ± 0.61	.42
BMI (kg/m ²)	26.9 ± 0.55	27.1 ± 0.47	.51
Duration of infertility (y)	5.5 ± 0.51	5.4 ± 0.62	.80
Basal FSH (IU/L)	6.5 ± 0.74	5.9 ± 0.68	.26
Antral follicle count	12 ± 0.76	11.3 ± 0.44	.10
Total FSH/hMG	2066 ± 87.8	2050 ± 64.5	.75
Infertility cause: proportions			
PCOS	35 (24)	45 (30)	.59
Male factor	55 (37)	62 (41)	.49
Tubal	57 (39)	43 (29)	.07
No. of oocytes collected	16.50 ± 0.97	16.7 ± 0.95	.72
No. of matured oocytes	12.60 ± 0.74	12.85 ± 0.81	.68
No. of embryo transferred	1.74 ± 0.07	1.72 ± 0.07	.58

Note: Data presented as mean ± SD or n (%), unless specified otherwise. Comparison of differences between the two groups was by t-test for unequal sample variances, and chi-square test or Fisher's exact test where appropriate. Data presentations are mean (for unequal variance) and proportions whenever appropriate. The baseline characteristics were similar in both groups. Male factor infertility is based on fresh semen samples only (does not include globozoospermia and pinhead samples or surgically retrieved sperm). BMI = body mass index; FSH = follicle-stimulating hormone; hMG = human menopausal gonadotropin; PCOS = polycystic ovary syndrome.

Fawzy. Humidity influences embryo development. Fertil Steril 2017.

TABLE 2

Embryologic outcomes in the dry versus humid culture groups.

Outcome	Dry culture (n = 147)	Humid culture (n = 150)	Odds ratio (95% CI)	P value
Maturation rate/collected oocytes	1,856/2,425 (77)	1,928/2,510 (77)	0.98 (0.86–1.12)	.82
Fertilization rate/injected MII oocytes	1,399/1,856 (75)	1,407/1,928 (73)	1.13 (0.98–1.31)	.091
Per fertilized oocytes				
Cleavage rate	1,387/1,399 (99)	1,392/1,407 (99)	1.24 (0.58–2.67)	.57
Top-quality day-3 embryos	909/1,399 (65)	1,168/1,407 (83)	0.38 (0.32–0.45)	<.0001
Compaction rate on day 3	308/1,399 (22)	774/1,407 (55)	0.23 (0.19–0.27)	<.0001
Blastocyst formation rate	714/1,399 (51)	1,022/1,407 (73)	0.39 (0.33–0.46)	<.0001
High-quality blastocyst	490/1,399 (35)	858/1,407 (61)	0.34 (0.29–0.40)	<.0001
Cryopreserved blastocyst rate	464/1,399 (33)	769/1,407 (55)	0.41 (0.35–0.48)	<.0001

Note: Data are presented as proportions, n (%), unless specified otherwise.

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TABLE 3

Clinical outcomes in the dry versus humid culture groups by intention-to-treat analysis.

Outcome rates	Dry culture (n = 147)	Humid culture (n = 150)	Odds ratio (95% CI)	P value
Biochemical pregnancy	72/147 (49)	91/150 (61)	0.62 (0.39–0.99)	.043
Clinical pregnancy	63/147 (43)	85/150 (57)	0.57 (0.36–0.91)	.017
Chemical pregnancy	9/147 (6)	6/150 (4)	1.56 (0.43–5.62)	.54
Ongoing pregnancy	54/147 (37)	78/150 (52)	0.54 (0.34–0.85)	.008
Miscarriage	18/147 (12)	13/150 (9)	1.47 (0.69–3.12)	.31
Twin pregnancy	6/147 (4)	15/150 (10)	0.38 (0.14–1.02)	.047
Implantation	69/257 (27)	93/258 (36)	0.65 (0.45–0.95)	.025

Note: Data presented as proportions, n (%), unless specified otherwise. Logistic regression analysis was used for between-group data comparisons. Data presentations are proportions (rate difference) and 95% confidence interval (CI). Chemical pregnancy indicates a positive pregnancy test with no gestational sac identified 15 days after the test.

Fawzy. Humidity influences embryo development. Fertil Steril 2017.

本篇研究的結論：在體外培養的胚胎若是利用乾式培養的方式會顯著降低其著床率、臨床懷孕率與繼續懷孕率等。然而作者認為此結果仍須更多中心與更多隨機試驗的研究來支持本篇論點。

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