Table 1. Baseline characteristics

BMI	<18.5 (n=80)	18.5-25 (n=602)	25-30 (n=112)	≥30 (n=27)	P-value
Female age (y)	30.59 ± 4.30	30.87 ± 3.81	31.53 ± 3.89	29.89 ± 4.42	0.154
Infertility duration (y)	2.52 ± 1.91	2.14 ± 2.18	2.79 ± 2.47	2.89 ± 1.90	0.058
EM thickness in FET	9.66 ± 1.35	10.06 ± 1.69	10.49 ± 1.90	10.76 ± 1.54	0.001
No. of oocyte retrieved	15.91 ± 9.53	13.44 ± 6.31	12.65 ± 6.39	12.11 ± 6.62	0.081
Infertility type					<0.001
Primary infertility	40 (50.63%)	189 (31.87%)	38 (34.55%)	17 (62.96%)	
Secondary infertility	39 (49.37%)	404 (68.13%)	72 (65.45%)	10 (37.04%)	
Protocol in fresh cycle					0.008
Agonist	52 (65.00%)	274 (45.51%)	53 (47.32%)	17 (62.96%)	
Antagonist	23 (28.75%)	291 (48.34%)	48 (42.86%)	10 (37.04%)	
Other	5 (6.25%)	37 (6.15%)	11 (9.82%)	0 (0.00%)	
EM protocol					0.177
Natural cycle	6 (7.59%)	97 (16.28%)	15 (13.39%)	1 (3.70%)	
HRT	54 (68.35%)	393 (65.94%)	72 (64.29%)	21 (77.78%)	
GnRHa+HRT	19 (24.05%)	106 (17.79%)	25 (22.32%)	5 (18.52%)	
Live birth	32 (40.00%)	247 (41.03%)	44 (39.29%)	14 (51.85%)	0.686
Birth weight (g)	2657.36 ± 1540.01	2951.65 ± 1174.35	3070.47 ± 1270.92	2697.60 ± 1230.58	0.390
Miscarriage	3 (3.75%)	61 (10.13%)	12 (10.71%)	6 (22.22%)	0.051
Preterm birth	3 (3.75%)	13 (2.16%)	9 (8.04%)	1 (3.70%)	0.063
Clinical pregnancy	43 (56.58%)	395 (67.99%)	80 (73.39%)	23 (85.19%)	0.021
Pregnancy complication					0.291
No	75 (93.75%)	574 (95.35%)	105 (93.75%)	24 (88.89%)	
Placenta previa	0 (0.00%)	2 (0.33%)	0 (0.00%)	0 (0.00%)	
PIH	2 (2.50%)	9 (1.50%)	5 (4.46%)	1 (3.70%)	
Gestational diabetes	1 (1.25%)	14 (2.33%)	2 (1.79%)	2 (7.41%)	
Premature rupture of membranes	2 (2.50%)	1 (0.17%)	0 (0.00%)	0 (0.00%)	
Placental abruption	0 (0.00%)	1 (0.17%)	0 (0.00%)	0 (0.00%)	
Heart disease	0 (0.00%)	1 (0.17%)	0 (0.00%)	0 (0.00%)	
Type of delivery					0.497
Vaginal	5 (6.94%)	62 (11.42%)	6 (6.12%)	3 (12.50%)	
Cesarean section	27 (37.50%)	185 (34.07%)	38 (38.78%)	11 (45.83%)	
Fetal gender					0.855
Female	18 (56.25%)	129 (52.23%)	22 (50.00%)	6 (42.86%)	
Male	14 (43.75%)	118 (47.77%)	22 (50.00%)	8 (57.14%)	

BMI, body mass index; HRT, hormone replacement treatment; GnRHa, gonadotropin-releasing hormone agonist; PIH, pregnancy-induced hypertension; EM, endometrium; FET, frozen-thawed embryo transfer.

Table 2. Univariate analysis for live birth rate

Covariate	Statistics	OR (95%CI)	P-value
Female age (y)	30.90 ± 3.90	0.95 (0.92, 0.99)	0.015
Infertility duration (y)	2.29 ± 2.20	1.04 (0.97, 1.10)	0.921
EM thickness in FET	10.10 ± 1.70	1.04 (0.96, 1.13)	0.359
No. of oocyte retrieved	13.54 ± 6.76	1.01 (0.99, 1.03)	0.399
Infertility type			
Primary infertility	284 (35.11%)	Reference	
Secondary infertility	525 (64.89%)	0.76 (0.57, 1.01)	0.063
Protocol in fresh cycle			
Agonist	396 (48.23%)	Reference	
Antagonist	372 (45.31%)	0.60 (0.45, 0.80)	0.002
Other	53 (6.46%)	0.35 (0.18, 0.67)	0.002
EM protocol			
Natural cycle	119 (14.62%)	Reference	
HRT	540 (66.34%)	2.32 (1.48, 3.63)	0.002
GnRHa+HRT	155 (19.04%)	2.32 (1.38, 3.91)	0.002

OR, odds ratio; CI, confidence interval; BMI, body mass index; HRT, hormone replacement treatment; GnRHa, gonadotropin-releasing hormone agonist; EM, endometrium; FET, frozen-thawed embryo transfer.

Table 3. Relationship between BMI and live birth in different models

Outcome	Crude Model [a]		Adjusted Model ** Expression is faulty ** [b]		Adjusted Model ** Expression is faulty ** [c]	
	OR (95%CI)	P-value	OR (95%CI)	P-value	OR (95%CI)	P-value
BMI						
18.5-24.9	Reference		Reference		Reference	
<18.5	0.96 (0.60, 1.54)	0.860	0.77 (0.47, 1.26)	0.291	0.80 (0.47, 1.35)	0.402
25-30	0.93 (0.62, 1.40)	0.730	0.93 (0.61, 1.41)	0.721	0.85 (0.54, 1.35)	0.491
≥30	1.55 (0.72, 3.35)	0.268	1.21 (0.55, 2.67)	0.632	1.07 (0.48, 2.38)	0.864

OR, odds ratio; CI, confidence interval.

[a] We did not adjust other covariates.

[b] Adjusted for female age, protocol in fresh cycle and EM protocol.

[c] Adjusted for female age, infertility duration, EM thickness in FET, no. of oocyte retrieved, infertility type, protocol in fresh cycle (agonist, antagonist, other); EM protocol (natural cycle, HRT, GnRHa+HRT).

Figure 1 Multivariate adjusted smoothing curve of live birth rate by BMI.

Adjusted for female age, infertility duration, EM thickness in FET, no. of oocyte retrieved, infertility type, protocol in fresh cycle (agonist, antagonist, other); EM protocol (natural cycle, HRT, GnRHa+HRT).

In the figure, the solid line indicates the estimated risk of MZT, and the dotted lines represent pointwise 95% confidence interval.

Figure S1 NGS PGT cycle outcomes from 2012 to 2020.

Figure S2 Survival rates from 2012 to 2020.

Table S1. Effect size of BMI on live birth rate in prespecified and exploratory subgroups in each subgroup

Characteristic	No. of participants	OR (95%CI)[a]	P-value	P for interaction
Female age (y)				
Tertile 1 (<29)	221	1.07 (1.00, 1.15)	0.051	0.323
Tertile 2 (29-31)	272	0.99 (0.92, 1.07)	0.783	
Tertile 3 (>31)	328	0.96 (0.90, 1.03)	0.290	
Infertility duration (y)				
Tertile 1 (<1)	228	1.05 (0.95, 1.15)	0.917	0.239
Tertile 2 (1-2.5)	287	1.00 (0.93, 1.07)	0.070	
Tertile 3 (>2.5)	293	0.99 (0.94, 1.05)	0.053	
EM thickness				
Tertile 1 (<9.4)	242	1.00 (0.92, 1.08)	0.917	0.136
Tertile 2 (9.4-10.6)	264	0.93 (0.87, 1.01)	0.070	
Tertile 3 (>10.6)	256	1.08 (1.01, 1.15)	0.058	
No. of oocyte retrieved				
Tertile 1 (<10)	223	0.99 (0.93, 1.06)	0.841	0.128
Tertile 2 (10-14)	267	0.98 (0.90, 1.07)	0.609	
Tertile 3 (>14)	300	1.04 (0.98, 1.11)	0.218	
Infertility type				
Primary infertility	284	1.02 (0.96, 1.08)	0.477	0.173
Secondary infertility	525	0.99 (0.94, 1.05)	0.827	
Protocol in fresh cycle				
Agonist	396	1.01 (0.96, 1.06)	0.745	0.323
Antagonist	372	1.01 (0.94, 1.08)	0.839	
Other	53	0.99 (0.80, 1.23)	0.882	
EM protocol				
Natural cycle	119	1.10 (0.96, 1.26)	0.156	0.537
HRT	540	1.00 (0.95, 1.05)	0.928	
GnRHa+HRT	155	0.98 (0.90, 1.07)	0.673	

OR, odds ratio; CI, confidence interval; BMI, body mass index; HRT, hormone replacement treatment; GnRHa, gonadotropin-releasing hormone agonist; EM, endometrium.

[a] Adjusted for the subgroup variable.