Optimal endometrial thickness in fresh and frozen-thaw in vitro fertilization cycles: an analysis of live birth rates from 96,000 autologous embryo transfers

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Objective: To study the effect of increasing endometrial thickness on live birth rates in fresh and frozen-thaw embryo transfer (FET) cycles.
Design: Retrospective cohort study.
Setting: National data from Autologous in vitro fertilization (IVF) embryo transfer and FET cycles in Canada from the Canadian Assisted Reproductive Technology Registry Plus (CARTR Plus) database for records between January 2013 and December 2019.
Patients: Thirty-three Canadians clinics participated in voluntary reporting of IVF and pregnancy outcomes to the Canadian Assisted Reproductive Technology Registry Plus database, and a total of 43,383 fresh and 53,377 frozen transfers were included.
Intervention(s): None.
Main Outcome Measure(s): Clinical pregnancy, pregnancy loss, and live birth rates.
Results: In fresh IVF-embryo transfer cycles, increasing endometrial thickness is associated with significant increases in the mean number of oocytes retrieved, peak estradiol levels, number of usable embryos, clinical pregnancy rates, live birth rates, and mean term singleton birth weights, and a decrease in pregnancy loss rates. However, live birth rates plateau after 10–12 mm. In contrast, in FET cycles live birth rates plateau after the endometrium measures 7–10 mm. The improvement in live birth rates with increasing endometrial thickness was independent of patient age, timing of embryo transfer (e.g., cleavage stage vs. blastocyst stage), or the number of oocytes at retrieval.
Conclusions: In cycles with a fresh embryo transfer, live birth rates increase significantly until an endometrial thickness of 10–12 mm, while in FET cycles live birth rates plateau after 7–10 mm. However, an endometrial thickness <6 mm was associated clearly with a dramatic reduction in live birth rates in fresh and frozen embryo transfer cycles. (Fertil Steril® 2022;117:792-800. ©2021 by American Society for Reproductive Medicine.)
El resumen está disponible en Español al final del artículo.

Key words: ART, IVF, endometrial thickness, pregnancy outcomes, live birth

Endometrial thickness is measured routinely in in vitro fertilization (IVF) cycles. Our recent study showed that each millimeter decrease in endometrial thickness <8 mm at the time of human chorionic gonadotropin (HCG) trigger in fresh IVF-embryo transfer (IVF-ET) cycles and <7 mm at the time of initiating progesterone in frozen-thaw embryo transfer (FET) cycles was associated with a significant reduction in live birth rates (1). A thin endometrial lining also has been associated with an increased risk of spontaneous abortion (2, 3), ectopic pregnancy (4, 5), placenta previa (6), low birthweight (7–10), and other obstetric complications (11).

In contrast, an endometrial thickness beyond 7–8 mm generally has been associated with an improvement

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in IVF outcomes (12–16). One retrospective study of 6,331 fresh IVF-ET cycles reported a higher likelihood of live birth when the endometrial thickness was $\geq$11 mm compared to a lining of 7–11 mm (17). Another study of 10,787 fresh cycles found that an endometrial thickness >15 mm was associated with significantly higher clinical pregnancy rates than a lining of 8–11 or 11.1–14.9 mm (2). A third study involving 9,952 fresh cycles reported significantly higher live birth rates with an endometrial thickness $\geq$15mm compared to 9–14 mm (18).

Data on FET cycles are less consistent. A recent study involving 1,512 FETs with at least 1 morphologically good-quality blastocyst reported that endometrial thickness did not predict live birth rates (19). In contrast, another study involving 768 FETs reported that an endometrial thickness <7 or >14 mm was associated with the lowest chance of pregnancy, while a thickness of 9–14 mm maximized the chance of live birth and was significantly better than a thickness of 7–8 mm (20). A study of 2,997 FETs found that an endometrial thickness <9 mm was associated with lower live birth rates compared to those $\geq$9 mm, but that there was no significant difference between outcomes at 9–13 mm compared to those $\geq$14 mm (21). Thus, it remains unclear if pregnancy and live birth rates plateau at a certain point or if they continue to rise with increasing endometrial thickness. Moreover, it remains to be revealed if the optimal endometrial thickness is the same in fresh cycles compared to FETs.

The main objective of the present study was to determine in fresh IVF-ET and FET cycles if there is an endometrial thickness at which live birth rates peak and if there is an endometrial thickness beyond which live birth rates decline. We also sought to investigate if patient age, the timing of embryo transfer (cleavage stage vs. blastocyst), or the number of retrieved oocytes affect the relationship between endometrial thickness and live birth rates. Finally, we sought to evaluate the relationship between endometrial thickness and term singleton birthweight.

MATERIALS AND METHODS

In the last 20 years, the Canadian Assisted Reproductive Technology Registry (CARTR) has been collecting national outcomes for all IVF cycles. Clinics submit anonymized data for all patients undergoing assisted reproductive technology (ART) treatment and although participation is voluntary, nearly all Canadian clinics comply. In 2013, CARTR partnered with the Better Outcomes Registry & Network, Ontario's birth and perinatal registry to create CARTR Plus (22). In the province of Ontario, birth outcomes from the Better Outcomes Registry & Network are linked automatically to treatment cycle records, while throughout the rest of Canada, birth outcome data are entered by individual clinics. Recent data validation studies have found very high-quality correlation between data entered into the CARTR Plus registry and individual patient records (23, 24).

In this retrospective cohort study, we analyzed all autologous cycles from the CARTR Plus database that resulted in an embryo transfer from 2013 to 2019. During this period, data were available from 33 Canadian ART clinics. The endometrial thickness in fresh IVF-ET cycles was recorded on the day of trigger, while for FETs it was recorded before the initiation of progesterone or documentation of luteinizing hormone surge or HCG administration. Cleavage stage and blastocyst transfers were included, and blastocyst transfers on days 5 and 6 were analyzed together.

For fresh IVF-ETs and FETS, clinical outcomes were recorded. Outcome data included the number of transfers resulting in a positive HCG, number of clinical pregnancies, number of live births, and for all singleton births, gestational age at delivery and birth weight. In addition, for fresh IVF-ETs, peak estradiol levels, number of oocytes retrieved, number of fertilized eggs, number of usable embryos (defined as the sum of the number transferred and frozen), and number of embryos frozen were extracted.

In fresh IVF-ET cycles, data were analyzed for each 2-mm increase in endometrial thickness between 4 and 18+ mm. In contrast, for FET cycles, data were analyzed for each 2 mm increase in endometrial thickness between 8 and 18+ mm. In FET cycles, we separated those with a lining <8 mm into 3 groups: 4–5.9 mm, 6–6.9 mm, and 7–7.9 mm. The difference in approach was because our previous analysis of patients with a thin endometrium had shown that live birth rates in FET cycles were not different at 7–7.9 mm compared to all cycles aggregated together with a lining of $\geq$8 mm (1).

In addition, because the number of eggs at retrieval is an important determinant of live birth rates in fresh IVF-ET cycles (25, 26), we performed subgroup analyses for cycles with <4, 4–8, 9–12, and $\geq$13 eggs at retrieval. For this analysis, we divided the endometrial thickness into 4 groupings (<8, 8–11.9, 12–15.9, and $\geq$16 mm).

Clinical pregnancy was defined as the presence of a gestational sac on first trimester ultrasound and included intrauterine, ectopic, and heterotopic pregnancies. Clinical pregnancy and live birth rates all were calculated per embryo transfer. Pregnancy loss was defined as the number of pregnancies (positive HCG) minus the number of live births divided by the total number of pregnancies. This includes biochemical pregnancies, spontaneous abortions, and stillbirths.

In accordance with CARTR Plus policies, data in which total cell counts for the aggregate data were <6 were suppressed and, therefore, not independently reportable. Data were summarized using SAS 9.4 (SAS Institute, Cary, NC), and statistical analyses were performed using R version 3.6.2 (R Core Team, 2019). Analysis of variance and χ^2 tests were used on continuous and categorical variables, respectively. The false discovery rate method was used to correct for multiple χ^2 comparisons. Ethics approval was obtained from the Mount Sinai Hospital research ethics board (REB #18-0306C)

RESULTS

From January 1, 2013 to December 31, 2019, CARTR Plus recorded 96,760 autologous cycles that resulted in an embryo transfer. This included 43,383 fresh IVF-ET cycles and 53,377 FETs. Mean $\pm$ standard deviation endometrial thickness was 10.2 $\pm$ 2.3 mm in fresh IVF-ET and 9.6 $\pm$ 1.9 mm in the FET cycles.

During this 7-year period the annual percentage of fresh IVF-ET to total transfer cycles declined from 57%–31%, and the annual percentage of blastocyst-stage transfers rose from 51%–75% for fresh IVF-ETs and from 68%–96% for FETs. As a percentage of FET cycles, only 1% involved preimplantation genetic testing in 2013, while 15% involved such testing in 2019.

Baseline characteristics for fresh IVF-ET cycles are shown in Supplemental Table 1 (available online). In fresh IVF-ET cycles, increasing endometrial thickness was associated with younger patient age and higher parity, but not associated with the mean number of prior embryo transfers. Increasing endometrial thickness also was associated with higher peak estradiol levels and higher numbers of oocytes at retrieval and embryos available for transfer or cryopreservation. For fresh IVF-ET cycles the antagonist protocol was the most common (67%) followed by the long agonist protocol (17%) and the microdose flare (9%). Among patients with only 1 indicated reason for undergoing IVF, the 5 most common single diagnoses were male factor (35%), unexplained infertility (23%), diminished ovarian reserve (13%), tubal factor (10%), and endometriosis (5%).

Outcome data for fresh IVF-ET cycles are shown in Table 1. Increasing endometrial thickness was associated with significantly higher clinical pregnancy rates, lower pregnancy loss rates, higher live birth rates, and increasing mean singleton term birth weights. With each 2-mm increment in endometrial thickness, there was a statistically significant improvement in live birth rates up to an endometrial thickness of 12 mm, beyond which any of the differences in live birth rates ceased to reach statistical significance. When comparing live birth rates for an endometrial thickness <6 mm (15.8%) to one of 6–7.9 mm (22.1%) or 6–7.9 to 8–9.9 mm (28.1%) or 8–9.9 to 10–11.9 mm (31.8%) the *P* values were <.00001. However, when comparing live birth rates for an endometrial thickness of 10–11.9 mm to one of 12–13.9 mm (33.4%) the *P* value was.03, and when comparing 12–13.9 to 14–15.9 mm (33.7%) the *P* value was.88. The *P* values for 14–15.9 vs. 16–17.9 mm (37.7%) and 16–17.9 vs. ≥18 mm (33.8%) also were nonsignificant.

To control for the potential impact of age, we then stratified live birth outcomes into 3 age categories (age <35, 35–39 and 40+; Fig. 1). In each age category, there was a significant increase in live birth rates in fresh IVF-ET cycles as the endometrium thickened ($P < .001$). However, within each age category, the incremental improvements in live birth rates ceased to be statistically significant beyond 10 mm ($P = .12$ for 10–11.9 vs. 12–13.9 mm for women age <35, $P = .65$ for women age 35–39, and $P = .29$ for women 40+).

The increase in live birth rates with increasing endometrial thickness in fresh IVF-ET cycles also remained after accounting for the timing of endometrial transfer (Supplemental Fig. 1, available online). Cleavage stage and blastocyst-stage live birth rates increased significantly as the endometrium thickened ($P < .001$). However, in blastocyst-stage transfers the incremental improvement in live birth rates stopped reaching statistical significance after 12 mm ($P = .89$ for 12–13.9 vs. 14–15.9 mm), while for cleavage stage transfers, it stopped after 10 mm ($P = .52$ for 10–11.9 vs. 12–13.9 mm).

Because increasing endometrial thickness was associated with increased numbers of eggs at retrieval, we then analyzed fresh IVF-ET live birth rates for cycles with <4 eggs, 4–8 eggs, 9–12 eggs and 13 or more eggs (Fig. 2). Even after stratifying for the number of eggs at retrieval, the increase in live birth rates as the endometrium thickened remained statistically significant. Within each group, the difference was highly significant when comparing <8 to 8–11.9 mm ($P < .001$). However, for cycles in which <9 eggs were retrieved, live birth rates plateaued once the endometrial lining reached 8 mm ($P = .34$ for 8–11.9 vs. 12–15.9 mm when 4–8 eggs retrieved). In contrast, when ≥9 eggs were retrieved, live birth rates continued to rise up to an endometrial lining of 12 mm ($P < .001$ for 8–11.9 vs. 12–15.9 mm; $P > .2$ for 12–15.9 vs. ≥16 mm).

Finally, in fresh IVF-ET cycles, the statistically significant increase in live birth rates with increasing endometrial thickness was found for antagonist ($P < .001$), long ($P < .001$), and microdose flare ($P < .001$) protocols. It also was found for patients with male factor infertility ($P < .001$), unexplained infertility ($P < .001$), diminished ovarian reserve ($P < .001$),

TABLE 1

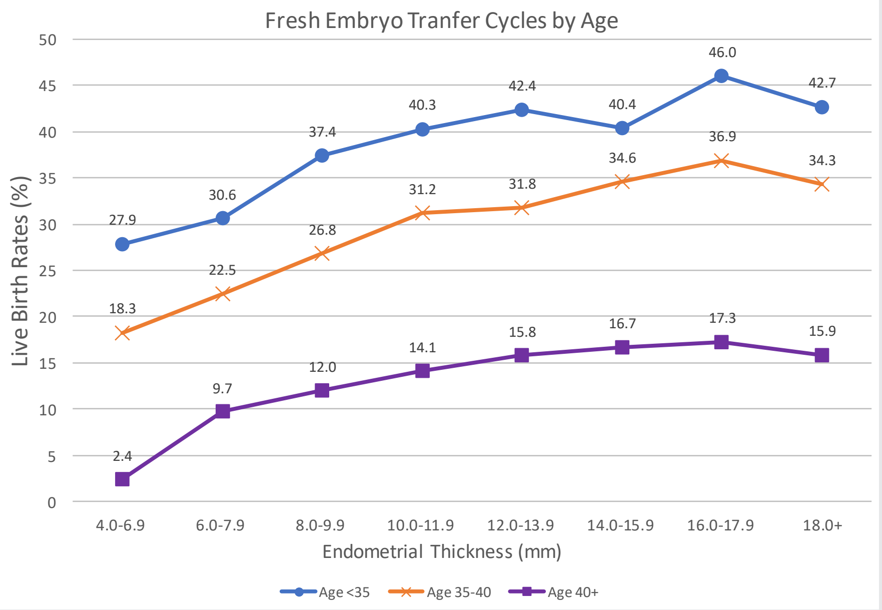
Clinical outcomes in fresh IVF-ET cycles by endometrial thickness

Endometrial thickness (mm)	Clinical pregnancy rate	Live birth rate	Pregnancy loss rate	Mean term singleton birth weight in grams (SD)
≥18	44.9% (105/234)	33.8% (79/234)	34.7% (42/121)	3,400 (427)
16–17.9	47.6% (288/605)	37.7% (228/605)	31.7% (106/334)	3,310 (395)
14–15.9	43.8% (966/2,207)	33.7% (743/2,207)	34.3% (388/1,131)	3,399 (420)
12–13.9	43.0% (2,899/6,739)	33.4% (2,250/6,739)	34.0% (1,159/3,409)	3,351 (434)
10–11.9	41.1% (5,620/13,672)	31.8% (4,345/13,672)	34.0% (2,239/6,584)	3,337 (430)
8–9.9	37.5% (5,415/14,444)	28.1% (4,059/14,444)	37.5% (2,432/6,491)	3,317 (427)
6–7.9	31.0% (1,574/5,084)	22.1% (1,126/5,084)	42.2% (822/1,948)	3,262 (438)
4–5.9	24.4% (97/398)	15.8% (63/398)	54.3% (75/138)	3,215 (547)
*P**	<.001	<.001	<.001	<.001

SD = Standard deviation.
* *P* values for differences in pregnancy outcome rates across endometrial thickness strata.

Mahutte. Optimal endometrial thickness in IVF. Fertil Steril 2021.

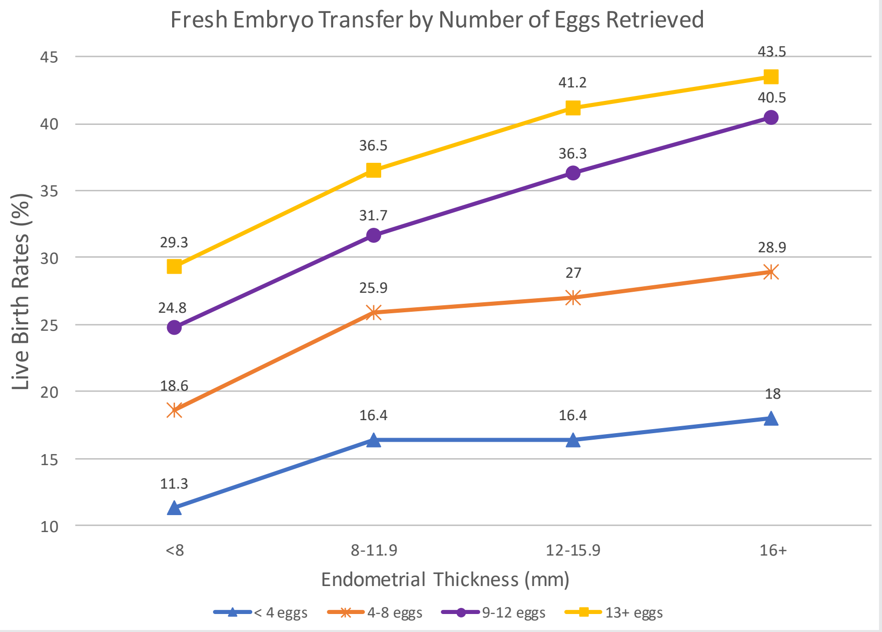
FIGURE 1



Endometrial thickness and fresh IVF-ET live birth rates by age.

Mahutte. Optimal endometrial thickness in IVF. Fertil Steril 2021.

FIGURE 2



Endometrial thickness and fresh IVF-ET live birth rates by number of eggs retrieved.

Mahutte. Optimal endometrial thickness in IVF. Fertil Steril 2021.

tubal factor infertility ($P < .001$), and endometriosis ($P < .001$), as well as for patients with >1 indicated fertility diagnosis ($P < .001$).

Baseline characteristics for FET cycles are shown in Supplemental Table 2 (available online). Significant differences were identified in patient age at cycle start, mean parity, and the mean number of prior embryo transfers as the endometrial thickness increased. In contrast, as the endometrial thickness changed no difference was noted in the number of thawed embryos transferred.

FET cycle outcomes are shown in Table 2. As with fresh cycles, there was a significant difference in clinical pregnancy rates, live birth rates, and mean term singleton birth weights as the endometrium thickened. Live birth rates rose significantly from an endometrial lining <6 mm (15.1%) to 6–6.9 mm (22.6%) to 7–7.9 mm (28.2%; $P \leq .005$). However, after 7 mm the improvement in FET live birth rates with increasing endometrial thickness begins to taper off (29.4% for 8–9.9 mm, $P = .23$ compared to 7–7.9 mm) and plateaus at 10 mm (30.8%, $P < .01$ compared to 8–9.9 mm; $P = 1$ for 10–11.9 vs. 12–13.9 mm).

In FET cycles, live birth rates increased significantly with increasing endometrial thickness for women aged <35 ($P < .001$), 35–39 ($P < .001$), and ≥40 ($P = .049$). However, within the 2 younger age categories, there was no significant improvement in live birth rates in FET cycles once the endometrium reached 7 mm. When FET cycles were analyzed by the timing of embryo transfer, the difference in live birth rates with increasing endometrial thickness was significant for blastocyst-stage transfers ($P < .001$), but not for cleavage stage transfers ($P = .12$, Supplemental Fig. 2, available online). For frozen-thaw blastocyst transfers the incremental improvement in live birth rates stopped reaching statistical significance once the endometrium reached 7 mm.

DISCUSSION

To the best of our knowledge, this is the largest study to date examining the impact of endometrial thickness on live birth rates in fresh and frozen-thaw IVF cycles. An endometrial thickness <6 mm is associated clearly with a dramatic reduction in the chance of live birth. With fresh embryo transfers, we found that the live birth rates increased significantly as the endometrium thickened until an endometrial thickness of 10–12 mm. In contrast, with FET cycles, live birth rates increased significantly as the endometrium thickened until an endometrial thickness of 7–10 mm. However, after these thresholds, live birth rates plateaued and we were unable to find an endometrial thickness beyond which live birth rates significantly declined.

In fresh cycles, increasing endometrial thickness was associated with significantly higher mean numbers of oocytes retrieved, mean peak estradiol levels, and mean numbers of usable embryos. This raises the possibility that the improvement in outcomes with thicker endometrial linings could simply reflect confounding by patients with better ovarian reserve and, therefore, a better prognosis for pregnancy. One also might expect the impact of these confounding factors to be reduced in FET cycles, since the embryos already exist, and thus, this could contribute to a difference in “optimal” thickness between fresh and frozen-thaw cycles.

To mitigate this potential confounder, we divided fresh transfers into subgroups based on the number of eggs at retrieval (<4, 4–8, 9–12, and >12). However, to our surprise, we continued to find a significant positive relationship between thicker endometrial linings and live birth rates in each subgroup. This suggests that there may be significant physiologic differences between the endometrium in fresh and frozen-thaw cycles that contribute to each type of cycle having a different optimal thickness.

It is possible that the difference in endometrial thickness thresholds between fresh and frozen-thaw cycles reflects the impact of controlled ovarian hyperstimulation (COH) on the endometrium. COH has been associated with premature endometrial luteinization and a premature appearance of the implantation window (27). Premature luteinization is common in COH cycles (28) and can induce significant alterations in the gene expression profiles of the endometrium (29, 30). Elevated progesterone levels on the day of trigger (31, 32) and the duration of progesterone elevation before trigger have been associated with reduced pregnancy rates in fresh IVF-ET cycles (33).

TABLE 2

Clinical outcomes in FET cycles by endometrial thickness

Endometrial thickness (mm)	Clinical pregnancy rate	Live birth rate	Pregnancy loss rate	Mean term singleton birth weight in grams (SD)
≥18	44.1% (60/136)	30.9 (42/136)	41.7% (30/72)	3,496 (432)
16–17.9	45.0% (159/353)	32% (113/353)	38.9% (72/185)	3,529 (563)
14–15.9	42.1% (604/1,434)	29.2% (419/1,434)	41.6% (299/718)	3,474 (450)
12–13.9	41.9% (2,134/5,094)	30.7% (1,566/5,094)	38.9% (998/2,564)	3,486 (441)
10–11.9	42.3% (5,728/13,539)	30.8% (4,169/13,539)	40.8% (2,875/7,044)	3,452 (442)
8–9.9	40.7% (10,218/25,089)	29.4% (7,375/25,089)	41.3% (5,197/12,572)	3,451 (445)
7–7.9	39.3% (2,476/6,302)	28.4% (1,791/6,302)	41.9% (1,293/3,084)	3,407 (424)
6–6.9	31.5% (334/1,059)	22.6% (239/1,059)	46.0% (204/443)	3,378 (440)
<6	29.1% (108/371)	15.1% (56/371)	62.2% (92/148)	3,412 (394)
*P**	<.001	<.001	<.001	<.001

SD = Standard deviation.
* *P* values for differences in pregnancy outcome rates across endometrial thickness strata.

Mahutte. Optimal endometrial thickness in IVF. Fertil Steril 2021.

The increase in live birth rates with increasing endometrial thickness in fresh IVF-ET cycles may be related to premature luteinization manifesting itself as early endometrial compaction/suppression of endometrial growth. In contrast, once embryos have been created and progesterone is well controlled, as typically occurs in FET cycles, premature luteinization would be a less likely cause for a thinner endometrial lining. Unfortunately, very few centers participating in CARTR Plus during the years studied routinely entered progesterone levels on the day of trigger or the day of initiation of progesterone. Thus, we cannot evaluate if fresh IVF-ET cycles with a thinner endometrial lining were more likely to be associated with premature luteinization than cycles with a thicker endometrial lining.

A recent publication involving 274 FETs suggested that the degree of endometrial compaction (a decline in endometrial thickness between the date of introduction of progesterone and the date of embryo transfer) is an important positive predictor of ongoing pregnancy rates (34). However, another recent study involving 3,091 FETs arrived at the opposite conclusion, that is an increase in endometrial thickness on the day of transfer compared to the day of progesterone administration was associated with the highest chance of clinical pregnancy (35). Unfortunately, our database cannot evaluate this question since the endometrial thickness at the time of FET is not recorded in CARTR Plus.

Our findings are in accordance with a study of 25,767 fresh IVF-ETs in the UK reporting that endometrial thickness is associated strongly with live births and pregnancy losses, and that the optimal endometrial thickness was $\geq$10 mm (15). They reported that this association was independent of confounding factors, such as age, oocyte number, number of transferred embryos and embryo quality. Our findings also are in accordance with a study from China involving 10,406 fresh IVF-ETs that divided patients into poor ($\leq$5 oocytes), medium (6–14 oocytes), and high ($\geq$15 oocytes) responders before analyzing outcomes based on endometrial thickness ($\leq$7, 8–13, or $\geq$14 mm) (13). In each category of responders, they reported improved ongoing pregnancy rates with increasing levels of endometrial thickness. Our findings regarding birthweight also are in accordance with the recent study from China reporting that an endometrial thickness $<$8 mm in FET cycles was associated with lower birthweights than an endometrial thickness of $\geq$10 mm (10). In fact, our data suggest that this observation is true for fresh and frozen-thaw cycles.

We find no evidence to support the idea that a lining that is “too thick” is detrimental to live birth rates. An earlier publication from a Canadian group had proposed that an endometrial thickness $>$14 mm was associated with lower implantation rates, lower pregnancy rates, and higher pregnancy loss rates (36). However, this suggestion was subsequently refuted by several studies (37–39), and in our data we find no evidence to support this hypothesis.

There are several limitations in our study. An important consideration is that ultrasound equipment and measurement techniques may vary across clinics. Although this accurately reflects what is encountered in clinical practice, it leaves open the possibility for measurement errors. However, such errors (if any) are likely to be nondifferential to clinical outcomes as they would tend to deflate the chance of differences between ET strata. We also could not control for the possibility of the same patient being included in the cohort more than once, for example, with $>$1 fresh IVF-ET and/or FET cycle at $>$1 IVF center. In addition, we did not have detailed information on demographic characteristics or embryo quality. In FET cycles it is possible that certain protocols, for example, estrogen/progestin vs. natural cycle, may impact the relationship between endometrial thickness and live birth rates (40, 41). Indeed, it is possible that the thickness and appearance of the endometrium may vary depending on the type of FET preparation protocol used. Unfortunately, our analysis did not allow us to investigate the impact of specific FET treatment protocols on endometrial thickness and pregnancy outcomes as this information is not included in the database.

We could not comment on the appearance, for example trilaminar vs. hyperechoic, of the endometrium or the timing of transfer with respect to peak endometrial receptivity since neither of these parameters was recorded in the database. It has been suggested that a trilaminar appearance may be as important if not more important than thickness itself (42). However, endometrial appearance may be subjective and depend on ultrasound equipment and technique, and we know of no data showing that endometrial appearance varies in a systematic fashion as the endometrial thickness increases (43, 44). Nevertheless, standardization of measurement technique and detailed recording of the endometrial appearance are critical for further research in this area, and efforts should be made to better train and audit those who provide ultrasound assessment of the endometrium so that these recordings can become more uniform.

CONCLUSION

In cycles with a fresh embryo transfer, live birth rates increase with increasing endometrial thickness until 10–12 mm, and in FET cycles live birth rates plateau after 7–10 mm. There does not appear to be a thickness above which pregnancy outcomes worsen.

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Grosor endometrial óptimo en ciclos de fecundación in vitro con transferencia embrionaria en fresco o de congelados; análisis de las tasas de nacidos vivos en 96,000 transferencias de embriones autólogos.

Objetivo: Estudiar el efecto del incremento del grosor endometrial en las tasas de nacidos vivos en ciclos de transferencia embrionaria en fresco y en transferencias de congelados (FET).

Diseño: Estudio retrospectivo de cohortes.

Entorno: Datos nacionales de Canadá de ciclos de fecundación in vitro (IVF) y de FET con embriones propios, extraídos de la base de datos del Canadian Assisted Reproductive Technology Registry Plus (CARTR Plus) entre enero de 2013 y diciembre de 2019.

Paciente(s): Se incluyeron los datos aportados por treinta y tres clínicas de Canadá que aportaron datos al registro voluntario de IVF y resultados de embarazo del Canadian Assisted Reproductive Technology Registry Plus database de un total de 43,383 transferencias en fresco y 53,337 transferencias de congelados.

Intervención(es): Ninguna.

Medida del resultado principal: Tasas de embarazo clínico, aborto y nacidos vivos.

Resultado(s): en los ciclos de IVF con transferencia en fresco, el aumento del grosor endometrial está asociado a incrementos significativos en la media de ovocitos obtenidos, pico de estradiol, número de embriones transferibles, tasas de embarazo clínico, tasa de nacidos vivos y peso medio de los nacidos de embarazos únicos y a un descenso en las tasas de aborto. Sin embargo, la tasa de nacidos vivos se mantuvo estable más allá de los 10-12 mm. Por el contrario, en los ciclos de FET las tasas de nacidos vivos no se incrementaron cuando el grosor endometrial aumentó más allá de los 7-10 mm. El incremento en las tasas de nacidos vivos con el aumento del grosor endometrial fue independiente de la edad de las pacientes, el momento de la transferencia embrionaria (ej, en células vs blastocisto) o el número de ovocitos obtenidos en la punción.

Conclusión(es): En ciclos con transferencia embrionaria en fresco, las tasas de nacidos vivos aumenta significativamente hasta un grosor endometrial de 10-12 mm mientras que en ciclos de FET las tasas de nacidos vivos se mantienen estables a partir de 7-10 mm. Sin embargo, un grosor endometrial < 6 mm se asoció claramente con una marcada reducción en las tasas de embarazo, tanto en ciclos en fresco como en los de embriones congelados.