Examining the effects of a large-scale merger on in vitro fertilization outcomes and patient satisfaction in fertility practices

OBJECTIVE

Within the healthcare sector, there has been a significant increase in the number of mergers over the last three decades (1, 2). However, the effect of consolidation on patient care has been debated (3–5). Furthermore, there are minimal data looking at a merger's effects on community-based clinics such as those within the field of Reproductive Endocrinology and Infertility, a sector impacted in recent years by the establishment of multiple large-scale physician practices created through consolidation. Therefore, the objective of this study was to examine the effect of a large-scale merger on reproductive outcomes and patient satisfaction at two large outpatient fertility centers within the United States.

STUDY DESIGN

This retrospective cohort study was conducted at an academically affiliated fertility center, Boston IVF, in the northeastern United States, which recently merged with a comparable practice. Patient demographics, cycle characteristics, and cycle outcomes were extracted from the electronic medical records of patients undergoing a single, autologous, fresh or frozen-thawed blastocyst transfer cycle at two outpatient fertility centers (Clinics A and B) from April 1, 2013, to March 31, 2017. Allowing for a one-year transition period after the official merger date (April 1, 2017), additional data were obtained from the merged institution (Clinic M) from April 1, 2018, to March 31, 2022. Moreover, available results from questions asked in patient satisfaction surveys distributed at each institution were obtained during the same time periods (Supplemental Table 1, available online). The primary outcomes included the rate of live birth, which was defined as any pregnancy $\geq$20 weeks gestational age resulting in the delivery of a live infant, and patients' overall satisfaction, which was assessed in the surveys using a Likert scale from 1 (low satisfaction) to 5 (high satisfaction). Along with the initial analysis, a sensitivity analysis was conducted to exclude data obtained between March 1, 2020, and December 31, 2021, and limit any effect of the acute coronavirus disease 2019 pandemic on study outcomes. Further methodology details are available in the Supplemental Methods section (available online).

RESULTS

There were 4,021, 5,932, and 16,196 single, autologous, fresh and frozen-thawed blastocyst transfer cycles completed at Clinics A, B, and M, respectively, during the specified time periods. Details regarding patient demographics and cycle characteristics are illustrated in Table 1.

Postmerger, 46.5% of embryo transfer cycles completed at Clinic M resulted in a live birth compared with 46.6% (P=.89) and 41.2% (P<.001) at Clinics A and B, respectively (Table 2). Using the premerged clinics as reference groups, and after adjusting for the age at oocyte retrieval, body mass index, cycle type (fresh vs. frozen), use of preimplantation genetic testing for aneuploidy, and history of prior embryo transfers, there was no significant difference in live birth rates between Clinic M and Clinic A (risk ratio, 0.97; 95% confidence interval, 0.93–1.01). However, Clinic M had a higher likelihood of live birth when compared with Clinic B

TABLE 1

Patient demographics and cycle characteristics premerger (clinics A and B) and postmerger (clinic M).

Characteristic	Clinic A N = 4,021	Clinic B N = 5,932	Clinic M N = 16,196
Age at cycle start (y)	34.8 ± 3.9	35.4 ± 4.1	35.6 ± 3.9
Age at egg retrieval (y)	34.3 ± 3.9	34.9 ± 4.1	34.8 ± 3.9
Antimüllerian hormone (ng/mL)	3.2 ± 3.1	3.4 ± 3.7	3.4 ± 3.4
Body mass index (kg/m^2)	26.5 ± 6.0	26.4 ± 6.3	26.9 ± 6.3
PGT-A among frozen cycles	538 (21.0)	826 (24.6)	5,563 (45.9)
Prior embryo transfer(s)	1,903 (47.3)	3,628 (61.2)	9,498 (58.6)
Cycle type			
Fresh	1,457 (36.2)	2,570 (43.3)	4,070 (25.1)
Frozen	2,564 (63.8)	3,362 (56.7)	12,126 (74.9)
Frozen cycle type			
Programmed/medicated	2,573 (64.0)	3,169 (53.4)	7,766 (48.0)
Natural/modified natural	1,448 (36.0)	2,763 (46.6)	8,429 (52.0)

Note: Data are shown as mean ± SD or as n (%). PGT-A = preimplantation genetic testing for aneuploidy.

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TABLE 2

Univariable and multivariable generalized estimating equation analyses comparing reproductive outcomes premerger and postmerger.

	Clinic A			Clinic B		
Outcome	**N (%)**	**Unadjusted**	**Adjusted[a]**	**N (%)**	**Unadjusted**	**Adjusted[a]**
Positive β-hCG						
Pre	2,756 (68.5)	Ref	Ref	3,874 (65.3)	Ref	Ref
Post	10,858 (67.0)	0.98 (0.95–1.002)	0.96 (0.94–0.99)	10,858 (67.0)	1.03 (1.004–1.05)	0.99 (0.97–1.02)
		P=.07	*P*=.01		*P*=.02	*P*=.51
Clinical pregnancy						
Pre	2,244 (55.8)	Ref	Ref	2,954 (49.8)	Ref	Ref
Post	8,938 (55.2)	0.99 (0.96–1.02)	0.97 (0.94–1.002)	8,938 (55.2)	1.11 (1.07–1.14)	1.05 (1.02–1.08)
		P=.49	*P*=.06		*P*<.001	*P*=.003
Miscarriage						
Pre	330 (8.2)	Ref	Ref	455 (7.7)	Ref	Ref
Post	1,286 (7.9)	0.97 (0.86–1.09)	0.99 (0.88–1.11)	1,286 (7.9)	1.04 (0.93–1.15)	1.12 (1.01–1.25)
		P=.58	*P*=.84		*P*=.51	*P*=.03
Live birth						
Pre	1,873 (46.6)	Ref	Ref	2,443 (41.2)	Ref	Ref
Post	7,524 (46.5)	1.00 (0.96–1.04)	0.97 (0.93–1.01)	7,524 (46.5)	1.13 (1.09–1.17)	1.04 (1.004–1.08)
		P=.89	*P*=.17		*P*<.001	*P*=.03

Note: β-hCG = β-human chorionic gonadotropin; BMI = body mass index; PGT-A = preimplantation genetic testing for aneuploidy; Ref = Reference.
[a] Adjusted for the age at egg retrieval, BMI, cycle type (fresh, frozen without PGT-A, and frozen with PGT-A), and history of prior embryo transfer.

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(risk ratio, 1.04; 95% confidence interval, 1.004–1.08). The sensitivity analysis, which excluded the acute phase of the coronavirus disease 2019 pandemic, showed similar findings (Supplemental Table 3, available online).

Additionally, 427, 6,273, and 8,181 patient satisfaction surveys at Clinics A, B, and M, respectively, were assessed over the same time periods. It should be noted that Clinic A had significantly less surveys available for analysis than clinics B and M given that, during a large majority of the premerger timeframe, responses at Clinic A were managed by a third-party vendor and are not currently available.

As shown in Supplemental Table 4 (available online), the mean overall satisfaction score of Clinic M was lower than that of Clinic A (4.4 vs. 4.6, $P<.001$), but higher than that of Clinic B (4.4 vs. 4.3, $P<.001$). These findings were also consistent in the sensitivity analysis (Supplemental Table 5, available online).

CONCLUSION

The increase in the consolidation of community-based clinics should cause clinicians and other stakeholders to contemplate the implications of a merger on both clinical outcomes and patient satisfaction. This study provides evidence that reproductive outcomes after a merger of fertility practices can be maintained or improved given that live birth rates were not negatively impacted despite the substantial increase in in vitro fertilization cycle volume postmerger. However, this study should also caution providers to examine how the provision of in vitro fertilization care is measured from a patient's perspective through live feedback, serial surveys, or an alternative method.

CRediT Authorship Contribution Statement

Quetrell D. Heyward: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Data curation, Conceptualization. **Denis A. Vaughan:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Laura E. Dodge:** Writing – review & editing, Methodology, Formal analysis. **Nick Hillis:** Methodology, Data curation. **Daniel Duvall:** Methodology, Data curation. **Denny Sakkas:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Riwa Sabbagh:** Writing – review & editing, Conceptualization. **Ann Korkidakis:** Writing – review & editing, Conceptualization. **Alan S. Penzias:** Writing – review & editing, Supervision, Methodology, Conceptualization.

Declaration of Interests

Q.D.H. has nothing to disclose. D.A.V. has nothing to disclose. N.H. has nothing to disclose. D.D. Jr. has nothing to disclose. D.S. has previously spoken on panels sponsored by EMD Serono, has stock options in ALIFE and Rita Health, and is on the advisory board of LEGACY. R.S. has nothing to disclose. A.K. has nothing to disclose. A.S.P. has nothing to disclose.

Quetrell D. Heyward, M.D., M.B.A.[a,b,c]
Denis A. Vaughan, M.D.[a,b,c]
Laura E. Dodge, Sc.D., M.P.H.[b,c,d]
Nick Hillis, B.A.[a]
Daniel DuvallJr.B.A.[a]
Denny Sakkas, Ph.D.[a]
Riwa Sabbagh, M.D.[a,b,c]
Ann Korkidakis, M.D., M.P.H.[a,b,c]
Alan S. Penzias, M.D.[a,b,c]

[a] Boston IVF, Waltham, Massachusetts; [b] Department of Obstetrics and Gynecology, Beth Israel Deaconess Medical Center, Boston, Massachusetts; [c] Department of Obstetrics, Gynecology and Reproductive Biology, Harvard Medical School, Boston, Massachusetts; [d] Department of Epidemiology, Harvard T.H. Chan School of Public Health, Boston, Massachusetts
Correspondence: Quetrell D. Heyward, M.D., M.B.A., Boston IVF, 130 2nd Ave, Waltham, Massachusetts 02451.
E-mail address: qheyward@bostonivf.com

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