Commercialization, Altruism, Clinical Practice: What Explains Similarities and Differences in Californian and Canadian Gestational Surrogacy Outcomes?

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ABSTRACT

*Background***:** Surrogacy is growing world-wide. While recently some countries have sought to ban it, between 2010 and 2014 the number of babies born to gestational surrogates having IVF treatment in California doubled and in Canada, it grew by 35%. This paper seeks to fill identified knowledge gaps about the similarities and differences in the practices and outcomes of gestational surrogacy which in California operates on a commercial basis though in Canada, it is illegal to pay a surrogate. The paper focusses on the period 2010 to 2014 for which comparable American and Canadian national assisted reproduction technology information exist.

Study Design: A retrospective data analysis was performed using information on gestational surrogate multiple births obtained from Centres for Disease Control and Prevention National Assisted Reproductive Technology Surveillance System (NASS) and Canada's Assisted Reproduction Registry-Better Outcomes Registry and Network (CARTR-BORN). Multiple birth rates and transfers of multiple embryos were compared using relative risk analysis. Adherence to voluntary ASRM-SART and CFAS embryo transfer guidelines was modelled.

Findings: Among gestational surrogates, when donor ova embryos obtained from women aged less than 35 were used, embryo transfer guideline adherence was 42% in California and 48% in Canada.

*Conclusions***:** Regardless of where on the commercial/non-commercial boundary North American surrogates reside, they are more likely to receive more donor ova embryos per IVF transfer than other IVF patients. Altruistic desire to assist childless couples and individuals create families along with clinic practices appear to play major roles in treatment decisions privileging the transfer two or more embryos.

Lessons for Practice and Policy: Third-party reproductive decision-making is complex and nuanced. If recent trends hold, surrogacy in both California and Canada will experience sustained growth. Given this dynamic situation, it is extremely important that IVF practices and guidelines build in provisions for surrogate patients.

Introduction

Surrogacy is growing world-wide. While recently some countries have sought to ban it (*The Economist*, May 2017), between 2010 and 2014 the number of babies born to gestational surrogates having IVF treatment in California doubled (Figure 1) and in Canada the reported number grew by 35%. (Figure 2) In both jurisdictions, assisted reproductive fertility treatment occurs in non-government regulated, fee-for-service IVF clinics where surrogacy is available to intended parents regardless of their usual place of residence, marital status, or sexual orientation.

In California, commercial surrogacy is legal (*California Family Law Code* 2016, Part 7) and pre-birth contracts are enforceable (*Johnson v Calvert*, 1993). Surrogacy in Canada, on the other hand, "ambivalently straddle[s] the commercial/non-commercial divide" (Millbank, 2015, p.480). Canadian law prohibits payment to surrogates, though they are entitled to receive reimbursement for expenses directly related to their surrogate pregnancy (*Assisted Human Reproduction Act* 2004, s.6 and s.12). Payment for the services provided by physicians, lawyers, counsellors, and surrogacy brokering agencies is permitted, however. Surrogacy arrangements are not legally binding, yet there is little evidence of Canadian surrogates refusing to relinquish the child to intended parents (Busby & Vun, 2010, p.32). Unlike California, where the 'doctrine of intent' establishes pre-birth parental rights in favour of intended parents, *w*hen Canadian surrogacy arrangements unravel it is often the surrogate who ends up parenting the child regardless of her genetic relationship to it (Archambault, 2012).

In light of the growth in surrogacy in Canada and California and the differing legal regimes governing its practice, the paper seeks to fill identified knowledge gaps (Söderström-Anttila et al., 2016). It focusses on the period 2010 to 2014, for which comparable American and

Canadian national assisted reproduction technology (ART) information exist. During this time, 4,677 gestational surrogate (GS) IVF cycles occurred in California IVF clinics compared to 1,864 in Canada. In both locations, cross-border surrogacy is emerging as an important factor influencing its growth: 44% of 2015 California GS IVF cycles were undertaken for non-US resident intended parents. While Canadian figures are more difficult to obtain as its national ART registry does not collect this data, BC vital statistics figures for 2015 indicate that 33% of surrogate-born off-spring were registered as the children of international intended parents (White, 2017a).

There is a degree of commonality in how ART is practiced in both locations. For example, voluntary treatment guidelines developed by national fertility associations recommend that one embryo be transferred when the recipient is age less than 35 years. (Table 1) When donor eggs are used, one embryo should be transferred when the genetic donor of the egg was under age 35 at the time of the ova donation. (ASRM-SART, 2013; Min & Sylvestre, 2013). The province of Quebec is an exception to this rule, however. In 2010, when it regulated and funded fertility treatment, single embryo transfer for all women aged 38 or younger was mandated, a practice which resulted in a significant decline in number of multiple births experienced by Quebec IVF patients (Bissonnette et al., 2011).

Guidance regarding the use of third-party reproduction (surrogates, gamete donors) have been issued by American and Canadian medical associations (ACOG, 2015; Reilly, 2007) and assisted reproductive societies (Havelock et al., 2016; ASRM-SART, 2015). American and Canadian national medical associations advise surrogates to have their own attending physician. Clinicians are reminded of their legal requirement to consider the surrogate as a patient who must provide informed consent prior to treatment.

It has long been recognised that IVF results in high levels of multiple births (Kissin et al., 2015; Stern et al., 2007; Jain et al., 2004; Jones & Schnorr, 2001). This worrisome finding has known health consequences for pregnant women and their babies (Sazanovia et al., 2013; McKay et al., 2006; Pharoah, 2006; Schieve et al., 2002). It also leads to an increased burden on neonatal intensive care (Merritt et al, 2014; Expert Panel, 2009) and may have life-long health and financial implications (Collins, 2007).

Research shows that gestational surrogates (GS) have higher levels of multiple births and are more likely to receive a multiple embryo transfer than other IVF patients (non-GS) (Perkins et al., 2016; White, 2016). A systematic review of surrogate pregnancy outcomes concludes that surrogates, while often younger than other IVF patients, experience similar levels of hypertensive disorders and placental complications (Söderström-Anttila et al., 2016). Researchers interviewing surrogates and analysing their online support forum discussions report incidents of pregnancy, delivery, and postpartum complications ranging from life-threating to those of a less serious nature (Jacobson, 2016, p.133; Berend, 2010, p.258). Evidence emerging from Canada suggests that as the surrogate population ages and parity increases, they experience gynaecological difficulties concomitant with repeat pregnancies, multi-foetal deliveries, and caesarean sections (Blackwell, 2015).

The paper argues that multiple births can be viewed as a proxy indicator for issues such as GS reproductive choice and decision-making, clinical practice, and adherence to professional guidelines. Examining multiple embryo transfers in two different countries sharing similar treatment guidelines but exhibiting differing legal permissions regarding the payment of GS

compensation affords the opportunity to investigate surrogacy practices and outcomes and to explore a range of possible explanations for the observed similarities and differences.

This paper will examine the importance of clinical practices and investigate their relationship to outcomes (Söderström-Anttila et al. 2016). It will also shed light on the parameters of surrogate altruism and gift-giving, factors that many researchers argue transcend payment (Jacobson, 2016; Berend, 2012; Teman, 2010; Ciccarelli & Beckman, 2005; Ragoné, 1999). In so doing, the paper will add to knowledge about the permeability of the commercial/ non-commercial boundary shaping the practice of gestational surrogacy in California and Canada.

Study scope and objectives

In gestational surrogacy, the woman who agrees to conceive and bear a child for a couple or an individual is not genetically related to the intended off-spring. Between 2010 and 2014, 5.2% of the IVF cycles performed in California clinics involved GS patients compared with 2% in Canada. Nearly 30% of all US GS births occurred to women receiving fertility treatment in California IVF clinics (Perkins et al., 2017). Within Canada, it is estimated that approximately two-thirds of all GS IVF cycles take place in the provinces of Ontario (Dar et al., 2015) and British Columbia (Vital Statistics, 2016). It also occurs in other provincial jurisdictions. For example, Nova Scotia and Alberta have favourable parentage laws (Nelson, 2013). The practice is much less likely to occur in Quebec as the province's Civil Code, Article 541, affirms the absolute nullity of surrogacy agreements. Even so, Quebec courts have developed case law to grant parentage (Tremblay, 2015).

Two Canadian provinces have paid or continue to pay for surrogacy IVF treatment costs. In Quebec, same-sex male couples like opposite-sex couples have obtained government funding

for surrogate IVF treatments (CBC, 2014). However due to escalating health care costs, in 2015 Quebec delisted IVF treatment from its schedule of paid health services with the result that Quebec residents no longer obtain free IVF fertility treatments. The province continues to fund assisted insemination (AI) for all Quebec residents, including surrogates. In 2016, Ontario began funding IVF and AI and surrogates are considered to be eligible patients.

In California and in the majority of Canadian provinces, IVF is a privately-funded medical expense. In the US, surrogates seek to obtain health insurance coverage for a surrogate birth (May & Tenzek, 2016, p.444; RESOLVE). In Canada, a surrogate's prenatal check-ups and birthing costs are paid by her provincial medical care plan. If she also holds private medical insurance that includes drug costs, these expenses would be covered though likely on a fixed percentage basis. If she is employed prior to and during her surrogate pregnancy, she will be eligible for a 15-week paid maternity-leave benefit.

The amount intended parents (IPs) pay for a surrogate birth differs between the two study locations. In California, costs range from $US 150-200,000, with the surrogate receiving between $20-40,000 in compensation for her time and effort. A premium of $10-15,000 for the delivery of twins or triplets is not unknown. The total amount noted above includes clinic treatments, payment for donor ova if needed, and expenses incurred by the surrogate during her pregnancy such as medical and life insurance, legal fees, travel, and living costs. In some US states, notably Illinois and Delaware, medical care costs incurred in the 8 weeks following a surrogate birth are to be covered (Storrow, 2015, p.203). Research shows that about 95% of US surrogates have access to medical insurance during pregnancy and delivery though fewer than three-quarters appear to receive psycho-social counselling (Fuchs & Berenson, 2016).

Canadian surrogacy is less costly: $CAN 80-120,000. Unlike California, Canada's *Assisted Human Reproduction Act* 2004 (AHR Act) criminalises the payment to a surrogate though her surrogate pregnancy expenses can be reimbursed. Information available from UK and Canadian court documents indicate that Canadian surrogates' expenses are about one-half of that received by their US counterparts: $CAN15-20,000 (Vasanti, 2016; Jackson, 2016; J.R. v C.R. 2015 BCPC 0054 at 34 & 35). There is no indication that Canadian surrogates necessarily receive a premium for carrying twins. Legislative initiatives begun in October 2016, some twelve years after the passing of the AHR Act, suggest that Canada is likely to now formalise a list of allowable reimbursable surrogacy expenses (Canada Gazette, 2016).

The study uses fertility treatment information obtained from US and Canadian national assisted reproduction technology (ART) registries to examine the incidence of multiple births and multiple embryo transfers occurring to women who received fertility treatment in Californian and Canadian IVF clinics. It examines a number of factors that may have a bearing on embryo transfer practices, including embryo transfer guideline compliance. It considers commercial compensation, an element that may have some explanatory value in California but that which is less likely to be relevant in Canada. The paper also looks at the work of Jacobson (2016, 172) who suggests that non-monetary factors play a decisive role in surrogate decision-making. Her research argues that factors such as twin preference; GS strong desire for a successful surrogate journey, including one that develops into a post-birth relationship or possibly a subsequent surrogate-birth; and the value surrogates place on gift-giving may privilege multiple embryo transfers. Research also shows that fertility patients in their desire to have a child may underestimate the health risks associated with twin births (Klitzman, 2016). These factors along with costly IVF treatments, lack of ART funding, and past unsuccessful transfer cycles may tip the balance towards the transfer of two or more embryos when the patient is a

surrogate (Berend, 2010, 2012, 2016; Smietsma, 2017; Millbank, 2015; Jackson et al., 2017). In both countries, IVF clinics strive for high IVF pregnancy success rates, a motivation that also encourages multiple embryo transfers for all patients.

Materials and Methods

Ethics approval for the study was obtained from the Kent Law School Ethics Review Board, University of Kent, Canterbury, United Kingdom. No identifiable information was made available to the author by either the Centers for Disease Control and Prevention (CDC) or Canada's Better Outcomes Registry and Network (BORN).

Author-designed custom tabulations were obtained on request from the CDC National ART Surveillance System (NASS) for 2010-2014 (CDC, 2016, 2017) showing the prevalence of one, two and three+, fresh and frozen, donor and intended mother's (IM) ova used in embryos transferred per GS and non-GS IVF cycle undertaken in California IVF clinics. The data used in the paper include frozen IM and donor ova as the practice is no longer viewed as experimental (Crawford et al., 2016).

An identical set of custom tabulations covering the same time period were obtained from Canada's national ART registry, CARTR-Plus (BORN, 2016). It should be noted that CARTR-Plus is a voluntary ART registry governed by IVF clinic directors. Unlike the US, which in 1992 mandated the collection by CDC of IVF clinic treatment statistics (*Fertility Clinic Success Rate and Certification Act of 1992)*, no Canadian law requires a public health organisation to collect and disseminate ART data.

The descriptive analysis presented in the paper shows the level of multiple births to California and Canadian GS over the period 2003 to 2014, as this reveals longer term trends. Relative risk analysis and modelling of the adherence to the ASRM-SART and CFAS embryo transfer guidelines covers the most recent five-year period (2010-2014) for which comparative California and Canadian GS data exist. Given the tabular structure of the data obtained from NASS and CARTR-Plus, relative risk analysis (Schmidt & Kohlmann, 2008) was performed using Medcalc. A p-value of <0.05 was considered statistically significant. Adherence to professional embryo transfer guidelines were modelled for one-embryo transfers. ASRM-SART (2013) and CFAS (2013) voluntary embryo transfer guidelines recommend that when the genetic ova donor (third-party or IM) is age < 35 years, a characteristic typical of over 90% of all embryos containing fresh donor ova and approximately 40% of those containing IM fresh ova, only one embryo should be transferred per IVF cycle.

For the years covered by the study period, NASS received annual fertility treatment data from 97% of US IVF clinics (Perkins et al., 2017). Canadian IVF clinics reporting frequency averaged between 98 to 100% (CARTR-Plus, 2016).

Data deficiencies, including a lack of data on age of surrogate and provision of national data only for Canada, and missing statistics in the NASS data for age of surrogate (36%) and age of third-party fresh ova donor (33%), attenuate findings. The lack of separate provincial-level data means that it was not possible to model Quebec embryo transfers separately from the rest of Canada. As a result, the inclusion of the Quebec data, which reflects a higher age threshold for single embryo transfer (age < 39), likely increases compliance to guidelines for non-GS patients. Given Quebec's legal position on the nullity of surrogate arrangements, it is likely that Quebec IPs arrange to have GS treatments and births occur outside of Quebec. Unlike the US

(Kirin et al., 2017), the lack of IPs usual residence data collection by CARTR-Plus means that little is known about Canada's inter-provincial surrogacy trends though case law indicates that it occurs (*Family Law Act (Re*) 2016 BCSC 22).

NASS and CARTR-Plus do not collect IP and GS socioeconomic information and hold limited demographic data on GS patients. NASS does not collect information on the sexual orientation of IPs, though this information is available from CARTR-Plus. By 2014, same-sex male couples and single male IPs were associated with 40% of all Canadian third-party donor GS cycles. Neither NASS nor CARTR-Plus record details about the commercial/non-commercial nature of the GS arrangement with IPs. The ART registry results used in the study are supplemented by qualitative research study findings based on interviews with surrogates and intended parents and analysis of online support forum information (Berend, 2010, 2012, 2016; Smietsma, 2017; Millbank, 2015; Jackson et al., 2017).

Results

GS multiple births decline in Canada and California

Over the extended time period, 2003 to 2014, the multiple births experienced by California and Canadian IVF patients gradually declined. Even so, GSs continue to have more multiple births than other IVF patients (non-GS). During the five years, 2010 and 2014, the level of multiple births for California GSs dropped from 34% to 25% and fell from 26% to 21% among non-GS California IVF clinic patients. A similar trend occurred in Canada as GS multiple birth deliveries dropped from 32% to 15%, while the non-GS level fell from 23% to 13%. (Figure 3)

California GS embryo transfers

The transfer of two or more embryos per IVF cycle contributes to a higher rate of pregnancy and increases the occurrence of multiple births (Templeton & Morris, 1998; Jones & Schnoor, 2001). During the study period, California GSs saw higher order embryo transfers of three or more decline dramatically from 47% in 2010 to 15% by 2014, while non-GSs experienced a decline from 38% to 14%. Even so, by 2014, just under 60% of all transfers involved two or more IM ova embryos. (Figure 4A, 4B) Over the five-year period, GS and NGS experienced no statistical difference in relative risk of receiving two or more embryos per IVF transfer. (Table 2)

However, when embryos contained third-party donor ova, GSs were more likely to receive multiple embryo transfers compared to non-GSs. (Figure 4C, 4D) Over the 2010-2014 period, Californian GSs had a 6% higher relative risk of receiving two or more donor ova embryos per IVF embryo transfer compared to non-GSs. This result suggests that GS and non-GS decision making about the numbers of embryos to transfer may differ when donor ova embryos are used. Embryos containing donor ova comprise nearly three-quarters of all GS IVF transfer cycles, compared to just under one-sixth of non-GS embryo transfers. (Table 2)

Canadian GS embryo transfers

Canadian IVF embryo transfer patterns are more complex and reveal differing trends. By 2014, as Figures 5A and 5B demonstrate, 42% of non-GSs experienced a multiple IM ova embryo transfer, compared to over half of GSs. When donor ova were used, 44% of Canadian non-GSs had two or more embryos transferred, compared to 57% of GSs (Figures 5C, 5D).

Regardless of the origin of the ova, Canadian GSs were nearly 24% more likely to receive 2 or more embryos per IVF transfer cycle than non-GSs. Canadian GSs had 15% higher relative risk

of a multiple embryo transfer when IM ova were used. When embryos containing third-party donor ova were used, they had a 27% greater relative risk of a multiple embryo transfer compared to non-GSs. Approximately 51% of all embryo transfers experienced by GSs involved third-party donor ova, compared to 6% experienced by non-GS patients. (Table 2)

California and Canadian GS embryo transfers

This next section compares California and Canadian GS embryo transfer patterns. Overall, between 2010 and 2014, California GSs had a 7% higher relative risk than Canadian GSs of receiving a multiple embryo transfer. When IM ova embryos were used, California surrogates were 16% more likely than their Canadian counterparts to have a multiple embryo transfer. However, when embryos containing third-party donor ova were transferred, there was no statistically significant difference in relative risk between California and Canadian GSs in having a multiple embryo transfer. (Table 2).

Adherence to embryo transfer guidelines

Both ASRM-SART (2013) and CFAS (Min & Sylvestre, 2013) guidelines recommend that one embryo be transferred per IVF cycle when it contains ova obtained from a woman age <35 years. When this criterion is applied, findings reveal that guidelines were less likely to be followed when GSs receive third-party donor ova embryos. By 2014, in California 42% of GS embryo transfers containing fresh donor ova complied with the ASRM-SART guidelines. In Canada, guideline compliance was 48%. (Figure 6)

Discussion

Findings reveal a complex pattern of outcomes for California and Canadian GSs. Overall, the level of multiple births to GSs continues to drop. This is a positive outcome. Yet as Figures 1

and 2 demonstrate, there exists a widening gap between the number of GS pregnancies and births. Factors such as poor detection of pregnancies displaying multi-foetal heart beats, stillbirths, miscarriages, and terminations as well as an under-reporting of births may be some of the factors contributing to the increasing difference between the number of GS pregnancies and births (Kissim et al., 2016).

Moreover, the means by which the decline in multiple birth was achieved differs somewhat between the two jurisdictions. Beginning in 1998 when it became apparent that IVF techniques contributed to higher order multiple births, the US reproductive fertility associations ASRM and SART approved and published voluntary embryo transfer guidelines. The Canadian fertility association, CFAS, followed suit and issued guidelines similar to the ones approved by ASRM-SART. In 2010, when the province of Quebec mandated single embryo transfer for women aged 38 or less, CFAS responded by issuing elective single embryo transfer (eSet) guidelines for the rest of Canada. It also established a multiple birth best practice national objective of 15%.

However, it should be noted that in 2015 Quebec delisted IVF treatment expenses from its provincially funded medical plan. Even so, the single-embryo transfer regulation for patients age <39 remains in force. In response to a lack of funding, the number of IVF treatments appears to have dropped in favour of AI, which continues to be funded. This change suggests that multiple birth levels could rise: a result that recently has been confirmed (La Press, 2017; Hendry, 2017). Quebec's policy change occurred outside of this study's time frame. Also, outside of the study parameters is the situation of Ontario, which in early 2016 began to cover the costs of IVF and AI. Surrogates are eligible to receive funded IVF and AI fertility treatments but because Ontario does not statistically track surrogates' treatments separately

from other patients in the program, it will be difficult to determine the direct effect of funding on gestational and traditional surrogacy outcomes, including the incidence of multiple births (FOI, 2017).

Returning to study findings, by 2014 just 42% of Canadian non-GSs using their own ova embryos had a multiple embryo transfer, compared to 60% of California non-GSs and GSs and 53% of Canadian GSs when IM ova embryos are used. One could advance the argument that embryo transfer decisions made by Californian non-GSs and GSs and Canadian GSs reflect a strong desire for a biologically-related child on the part of intended parents, especially for those for whom surrogacy may be their last option (Tymstra, 2007; Twisk et al., 2007; Leese & Denton, 2010; Kovacs, 2015). Poorer quality IM ova embryos (Jain, Missmer & Hornstein, 2004), twin preference (Klock, 2004), and the high cost of IVF may also influence treatment decisions (Martin, 2011; Buckles, 2013). Also, fertility patients may minimise health risks and after-birth costs associated with twin births (Klitzman, 2016).

In Canada, the spill-over effect from embryo transfer regulations imposed by Quebec and IVF directors' objective of attaining a 15% overall multiple birth rate appears to have reduced the transfer of two or more embryos per IVF cycle, especially among non-GSs. It should also be noted, however, that Canadians are the most likely group of non-US resident patients to engage in US cross-border fertility treatment shopping (Levine et al., 2017). Canadian patients seeking higher order embryo transfers not permitted in their own province of residence do not need to travel very far to access US clinics, and when they do so, their fertility treatment and outcome data will be recorded in the NASS registry and not CARTR-Plus.

If we consider the transfer of embryos containing donor ova, California and Canadian GSs are equally as likely to receive multiple embryo transfers. One could argue that California and Canadian GSs are agreeing to a level of multiple embryo transfer that their non-GS counterparts appear unwilling to accept.

Clinic practices may also play important role. Not all physicians view twin births to be a risky business (Gleicher, 2013). Given that GSs are much more likely than non-GSs to receive a donor ova embryo, an IVF clinic practice using the surrogate age or IM age rather than the egg donor's age at the time of the donation would drive up the number of embryos transferred per cycle. Research suggests that in the US the average number of embryos transferred to GS patients tends to rise with the age of the surrogate, a finding suggesting that contrary to ASRM-SART embryo transfer guidelines, the age of the GS or IM rather than the age of the ova donor may be influencing the number of embryos transferred (White, 2017b). However, it is not possible to assess whether a similar pattern occurs in Canada, as surrogate age is not made available from Canada's ART registry, CARTR-Plus.

Canada and the California are not level playing fields when it comes to the provision of health coverage for surrogates. Perhaps in the case of Canadian surrogates, access to publicly available medical care and paid maternity leave serves to offset concerns about unexpected pregnancy complications. In California, surrogates must rely on health insurance providing coverage for a surrogate pregnancy. As well, the contract with IPs will need to address payment of health care costs. It should be noted that surrogates are a group of women for whom previous pregnancies posed few health concerns. Many surrogates do not expect to encounter difficulties in getting or staying pregnant. Nor do they typically expect to experience complications (Jacobson, 2016).

In 2014, the rate of twin births in the US reached its highest level ever recorded. Demographers conclude that the twin rate is unlikely to diminish given that it is fuelled by the practice of IVF and delayed childbirth (Hamilton et al., 2015). Twins offer same-sex and heterosexual IPs who desire more than one child the option of achieving a larger family with fewer pregnancies. Given the high costs of surrogacy, a twin birth is a financially attractive option. While the health risks of multiple foetal pregnancies and births have been well documented, there nonetheless exists clinical debate within ART circles as to whether one twin birth produces more of a health risk than two singleton births (Sazanova et al., 2013, Stillman et al. 2013; Gleicher, 2013). Yet, medical discussions about risk may not be top of mind for those whose motivation to be a surrogate is founded on a strong altruistic desire to help childless couples create a family and for whom past pregnancies were trouble-free.

Research suggests that first-time surrogates may be more enthusiastic about a multiple-birth pregnancy and may underestimate possible risks (Berend, 2010, p247). Moreover, surrogates often consider babies to be precious gifts to IPs and "more babies are even more of a gift." Multiple-birth pregnancy demonstrates the surrogate's altruistic motivations, enhances the journey, and "generates more of a story": one that creates interest and elicits support and praise from fellow surrogates and IPs (Berend, 2010, p.247). It is also an outcome that dovetails nicely with IVF clinics' desire to attain high pregnancy success rates.

The overwhelming desire on the part of surrogates to assist childless couples and individuals achieve a family plays an important role in treatment decision-making. Agreeing to carry twins influences surrogates' relationships with IPs while at the same time affecting their own home life, health, and family, often in ways they had not anticipated (Jacobson, 2016, Berend, 2012,

2016). Altruism infuses surrogacy practice and outcomes regardless of where the surrogate is positioned on the commercial/non-commercial legal boundary (Jacobson, 2016; van den Akker, 2007; Ciccarelli &Beckman, 2005; Jadva et al, 2003).

Berend (2016) observes that surrogates 'sacrilize' and revere reproductive technology as it enables them to assist childless couples and individuals create families. The results of this study show that in California and Canada, the transfer of 2 or more donor ova embryos per GS cycle is the norm and that Canadian GSs are just as likely to receive a multiple donor ova embryo transfer as their California counterparts. California GSs are as likely to receive a multiple IM ova embryo transfer as other Californian IVF patients. Based on these results it is difficult to sustain a harm-based argument advancing the position that financial incentives induce Californian GSs to opt for multiple embryo transfers. Factors such as clinic practices, surrogate motivation to accept multiple embryo transfer to ward off the possibility of cycle failure, desire to demonstrate their altruism, willingness to help IPs achieve their family completion goals, and a motivation to "earn one's wings" comprise some of the complex reasons for surrogate acceptance of a multiple embryo transfer (Jacobson, 2016; Berend, 2016).

Implications for Policy and Practice

The medicalization of reproduction holds the power to create dreams as well as to dash them. Unregulated practices reliant on adoption of voluntary practice guidelines while contributing to a reduction in higher order births has been helpful, but progress is slow. Moreover, fertility practice guidelines even the most recent set of embryo transfer recommendations (ASRM, 2017) do not specify explicit conditions for gestational surrogate patients: a rapidly growing clinic clientele.

North American fertility associations should look to the drafting of embryo transfer guidelines for gestational surrogate patients. For example, the European Society of Human Reproduction and Embryology (ESHRE) recommends the transfer of one embryo only per GS IVF cycle with two embryos being transferred in exceptional cases only (Shenfield et al., 2004; 2011). Given that donor ova are used in nearly three-quarters of California and over 50% Canadian GS cycles and that donor ova embryos overwhelmingly come from women age <35, GS should be receiving a considerably higher level of single embryo transfer than non-NGs. We should be seeing GS single embryo transfer levels in the order of 60 – 80% depending on the mix of IM to donor ova embryos used. As well, attention at the clinic level needs to be taken to ensure that age of the genetic ova donor at the time the ova were donated (IM and third-party) is recorded and used to determine the number of embryos to transfer and not the current age of the surrogate or intended mother. The continued higher levels of multiple embryo transfer experienced by GS argues strongly for the development and implementation of surrogate specific embryo transfer and fertility treatment guidelines.

Informed population health policy decision-making requires accurate and comprehensive ART data. The Canadian situation is especially problematic as key data elements are not being collected thereby rendering it impossible to fully assess professional guideline compliance and fertility treatment outcomes. Reluctance on the part of Canadian IVF directors to authorize release of sub-national ART information further confounds interpretation of analytical results. In both jurisdictions, greater efforts need to be made to obtain socio-economic and demographic information about surrogates as this would assist in the analysis of practice outcomes.

Research conducted with surrogates reveals a level of altruism leaning towards supererogatory acts of selflessness, the consequences of which have potential for interference with the surrogate's home, family and personal health-life balance. Given what GS have said about their unmet needs for counselling on matters such as bonding with IPs, expectations about post-birth relationships and unexpected implications for their own home and family relations more study appears to be required so to better address their psycho-social needs (Fuchs & Berenson, 2016; Jacobson, 2016; Berend, 2016). There is also a serious lack of research focusing on third-party reproduction decision-making. notably the impacts of the intersecting roles played by clinicians, surrogates and IPs. The Klitzman (2016) study of non-GS embryo transfer decision-making reveals an intricate dance occurring between patients and clinicians over issues such as risk perception, autonomy, medical paternalism, embryological practices, and counselling. A similarly structured study examining embryo transfer decision-making involving GS, IPs, and clinicians is needed.

Conclusion

This study using ART registry data reveals a complex and evolving North American fertility landscape. Findings show that regardless of where the surrogate sits on the commercial/non-commercial continuum, there is a commonality between California and Canada regarding multiple embryo transfer practices and outcomes when donor ova embryos are used. Multiple embryo transfers are declining, but progress towards achieving single embryo transfers among all GS patients using embryos from IM and donors age < 35 is slow. Clinical practice may be contributing to this outcome, especially if information on age of the ova donor is not used to determine the number of embryos to transfer. Findings from several qualitative studies also suggest that surrogates' strong desire to assist infertile couples create a family and their willingness to provide a gift of more babies in face of high IVF costs and IP desire for family

completion may be factors contributing to the observed higher level of multiple embryo transfers, though more needs to be known about how treatment decisions are made.

If recent trends hold, surrogacy in both California and Canada will experience sustained growth. Given this dynamic situation, it is extremely important that IVF practices and embryo transfer guidelines include specific provisions for surrogate patients. It is also important that further research be undertaken to better understand the health care, legal, and policy implications of surrogate altruism. For clinicians and counsellors, focused research on gestational surrogacy practices and outcomes will assist them to fulfill their duty of care responsibilities to surrogates and intended parents, act in the best interests of the child, and contribute to the delivery of appropriate counselling measures.

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