NEWSLETTER

This newsletter centers on reproductive topics with a genetics focus. If there is an organization or upcoming webinar you'd like me to include in a future newsletter, please feel free to reach out at genetics@modernreproduction.org.

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Webinars

FIVE STEPS OF CHOOSING YOUR DONOR

Lisa Shuman ,LCSW and Mark Leondires, MD

Sept 13, 2023 | 2 pm ET / 11 am PT

Register

PATIENT CLINICAL INFORMATION: THINGS TO CONSIDER WHEN SUBMITTING A PATIENT PHENOTYPE WITH YOUR SAMPLE

Bryce Mendelsohn, PhD and Jennifer Schleit, PhD

Aired in June 2022

Register

ISSUE 11

NEWSLETTER

The little lit review

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A systematic review of noninvasive preimplantation genetic testing for aneuploidy

Cengiz Cinnioglu, Ph.D., Heather Glessner, M.S., Amy Jordan, M.S., Sydney Bunshaft, M.S.

I learned something: blastocoel fluid biopsy as an attempted alternative to trophectoderm biopsy for preimplantation genetic testing. There have been few studies to investigate this as a potential : study 1 and study 2. Very simply, there is fluid that collects in the blastocoel cavity which can be collected by using needle, entering through cell junctions of the trophectoderm. The paper calls it "minimally invasive PGT-A".

The paper also brings up non-invasive PGT-A of utilizing the DNA from spent culture media for chromosomal analysis which has been under investigation for a few years now. Concordance rates to current PGT-A varies significantly; therefore, niPGT-A may provide limited utility in clinical care at this time until more studies are available. Variables to consider when deciding on standardized protocol for niPGT start with length of time the embryo is in the media, single versus co-culturing, amount of media, and the physical collection process.

Both miPGT and niPGT are compared to the results of current PGT-A, which the paper calls "invasive PGT-A". The article does not discuss nomenclature and marketing tactics, but it seems too obvious to leave out in this little lit review. The spectrum of invasiveness used will likely introduce a bias towards the least invasive technique. The same approach has been used in the prenatal space with the advent of the noninvasive prenatal test (NIPT) compared to invasive diagnostic procedures. People, reasonably, are more hesitant to proceed with an amniocentesis when the NIPT is presented as an option albeit with its own limitations. I'll make my prediction now - in 5 years this conundrum will be in our daily patient conversations.

From the article, a great summary of studies investigating concordance of PGT-A and niPGT

TABLE 1

Studies providing result concordance rates between trophectoderm biopsy and noninvasive sampling.

Manipulation before collection	Study	Culture time	Manipulation details	General concordance (%)
None				
	Galluzzi et al.[15] (2015)	D0–D3 (3 d)	-	1/2 (50)
		D3–D5/6 (2–3 d)	-	2/2 (100)
		D3–D5/6 (2–3 d)	-	5/5 (100)
	Liu et al.[16] 2017	D0–D5 (5 d)	-	26/31 (83.9)
	Capalbo et al.[17] (2018)	D1–D5 or D3–D5 (2–4 d)	-	27/72 (37.5)
	Rubio et al.[6] (2019)	D4–D5 (1 day)	-	17/27 (63)
		D4–D6/7 (2–3 d)		68/81 (84)
	Rubio et al.[6] (2019)	D4–D6/7 (2–3 d)	-	866/1108 (78.2)
	Chen et al.[18] (2021)	D3–5/6 (2–3 d)	-	190/256 (74.2)
	Xie et al.[19] (2022)	D4–D5/6	-	111/147 (75)
	Ho et al.[20] (2018)	D1–D5 (4 d)	-	10/12 (83.3)
Assisted hatching				
	Shamonki et al.[21] (2016)	D3–D5/6 (2–3 d)	Assisted Hatching	2/2 (100)
	Feichtinger et al.[22] (2017)	D0–D5 (5 d)	Assisted Hatching	13/18 (72.2)
	Vera-Rodriguez et al.[23] (2018)	D3–D5 (2 d)	Assisted Hatching	17/56 (30.4)
	Yeung et al.[24] (2019)	D3–D5 (2 d)	Assisted Hatching on day 3	38/50 (76)
		D3–D6 (3 d)	Assisted Hatching on day 3	47/66 (71.2)
	Lledo et al.[25](2020)	D3–D5/6 (2–3 d)	Assisted Hatching on day 3	62/83 (74.6)
				60/83 (72.3)
	Hanson et al.[11] (2021)	D5/6/7 (1–2 d)	Assisted Hatching on day 3	62/104 (59.6)
	Lei et al.[26] (2022)	D3–D5/6 (2–3 d)	Assisted Hatching on day 3	76/111 (68.5)
	Ho et al.[20] (2018)	D1–D5 (4 d)	Assisted Hatching on day 3	16/28 (57.1)
	Kuznyetsov et al.[4] (2020)	D4–D5/6 (1–2 d)	Assisted Hatching on day 4	88/90 (97.8)
Assisted hatching plus vitrification				
	Huang et al.[2] (2019)	D5–D6 (1 day) D6–D7 (1 day)	Assisted Hatching on day 3 plus day 5/6 Vitrification	41/46 (89.1)
Vitrification				
	Xu et al.[27] (2016)	D3–D5 (2 d)	Vitrification	36/42 (85.7)
Blastocoel collapse				
	Kuznyetsov et al.[28] (2018)	D5–D6 (1 day)	Double Blastocoel Collapse	27/28 (96.4)

Abbreviation: D = day.

Cinnioglu. A systematic review of noninvasive PGT-A. Fertil Steril 2023.

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NEWSLETTER

The little lit review

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Public views on polygenic screening of embryos

Michelle N. Meyer, Tammy Tan, Daniel J. Benjamin, David Laibson, and Patrick Turley

I'm halfway through the Tyranny of the Gene by James Tabery. It primarily focuses on the contention between funding for genetic versus environmental research of the American public. At the early stages of genetic research, genome wide association studies were used for the purposes to better understand more common disease such as hypertension, high cholesterol, yet as I am gathering, the book's position is that environmental contribution is more salient.

This conversation continues on the PGT stage for polygenic conditions. Few labs offer this option clinically despite discussions on its utility. While utility is an important area of study for this test, public attitudes is another noteworthy investigation as the public will eventually be faced with the downstream impact of this technology.

The article surveyed a national population representative of the US. 6823 individuals responded to the survey which focused not only on PGT-P but also gene editing and courses to prepare for the SAT. Questions included moral position of the service and willingness to use the service.

The authors posed the questions with qualifiers such as for PGT-P, the respondent was asked to answer as if they were already utilizing IVF and the technology, particularly gene editing, was deemed safe. What I found most intriguing is that the respondents were given the qualifier of either 1 in 10 people or 9 in 10 chose the option to assess how the response changes from more or less social acceptance from others.

Words matter but so do the numbers. I've been wondering how the number 1 in 6 (relating to couples that are infertile) impact decision making of pursuing IVF. Could the thought, well many people also experience infertility, thus also pursue IVF, make the decision to elect the option more readily? The idea of what others are doing to impact our decisions is a tremendously important point. I remember a patient once asking me, "do most people chose to terminate a pregnancy with a prenatal diagnosis". We want to know what others do in a similar situation.

The article discovered age and educational attainment drive differences in the responses. For those with an undergraduate degree, they were more likely to find PGT-P morally acceptable and willing to use it than those without an undergraduate degree. In academia, intelligence is an idealized trait. Could those with undergraduate degrees just be conditioned to value intelligence over other factors more than those not in the academic world? So many questions linger not only by me but the authors including:

Which traits do people want to select for or against?

How does relaxing the assumptions of free access and safety affect the rates, and distribution across groups, of moral acceptability and willingness to use?

How can we ensure that those with traits that others select against remain fully welcomed members of our society?

Should PGT-P be limited to certain traits, and if so, who would draw that line, and how?

Could choices about PGT-P be regulated without further threatening other reproductive choices?

Does widespread use of PGT-P pose acceptable population risks?

How can the complexities of PGT-P—e.g., pleiotropy, relative risk reduction—be conveyed to achieve appropriate consumer literacy?

NEWSLETTER

Community Content:

While we are in the world of reproduction, it is important to know that some individuals remain childless. There are organizations working to provide support. Click on the pictures to go to each link.

GATEWAY women
gateway-women.com

The Full Stop

World Childless Week

Modern Reproduction Content:

Instagram has its bright points but also the pain points. I can't tell you how many times I've been sucked into the rabbit hole of reels. With that being said, Instagram can be a great place to discover new content. Modern Reproduction is on the platform, and I've posted my very own reel :D