Perspectives of Preimplantation Genetic Diagnosis (PGD) Patients: Comparing Attitudes of Carriers with a Previously Affected Pregnancy to Patients Identified as Carriers through Expanded Carrier Screening

Samantha Melnick, MS[1], Jill Fischer, MS, CGC[1] , and Amy Jordan, MS, CGC[2]
[1]Long Island University – Post, Brookville, NY [2]Reprogenetics, LLC, Livingston, NJ

BACKGROUND

- Preimplantation genetic diagnosis (PGD) is available to couples at risk for transmitting inherited genetic disorders to offspring. Utilized with *in-vitro* fertilization (IVF), PGD affords couples in which both partners are carriers for the same autosomal recessive condition the chance to have embryos tested in the preimplantation stage. Subsequently, unaffected embryos are selected for transfer with the intent of establishing a healthy pregnancy.
- Couples in which both partners are carriers for the same autosomal recessive disorder have a 25% chance to have an affected child. Prior to the advent of PGD, the only option available to carriers of a single gene disorder who wished to have their own biological children was to perform diagnostic testing during pregnancy, with the choice of termination of an affected pregnancy. PGD testing has enabled carrier couples to make decisions in the preconception stage.
- As carriers are typically asymptomatic, PGD for autosomal recessive conditions presents some unique considerations, namely in identification of carrier status of both partners. Some couples learn that both partners are carriers for a genetic disorder after having an affected pregnancy or child. Other patients, particularly in recent years, seek IVF with PGD only after the administration of carrier screening, a test for both partners that will indicate carrier status for a various genetic syndromes.
- In recent years, as genetic testing capabilities and affordability have improved, expanded carrier screening (ECS) has become more widely available to preconception and prenatal patients. Many commercial companies now offer expanded panel tests for general population carrier screening, designed to detect carrier status for hundreds of autosomal recessive and X-linked recessive conditions.
- This study examines the perspectives of patients seeking PGD for autosomal recessive conditions, with the aim of defining factors that may differ between patients with a previously affected pregnancy or child and patients identified as carriers through ECS

OBJECTIVES

- Compare and contrast the attitudes, opinions, and beliefs of two groups of PGD patients: patients who learned of carrier status after a previously affected pregnancy or child versus patients who learned of carrier status after administration of ECS
- Explore perceived benefits and limitations of PGD
- Assess how patients experienced genetic counseling for PGD

METHODS

- Patients were recruited from Reprogenetics, a PGD reference laboratory in Livingston, New Jersey. Patients who had undergone PGD for an autosomal recessive condition within the previous 15 months were invited to participate in a 15-minute phone interview about their respective PGD experiences.
- The phone survey consisted of open-ended questions about carrier status, prior experience with the genetic condition, perceived benefits and limitations of PGD, and experience with genetic counseling
- Interviews were recorded and transcribed. Thematic coding was used to identify significant topics, followed by a comparison of theme distribution across subject groups. Subcategories were created within each code to explore similarities and differences between patient groups.

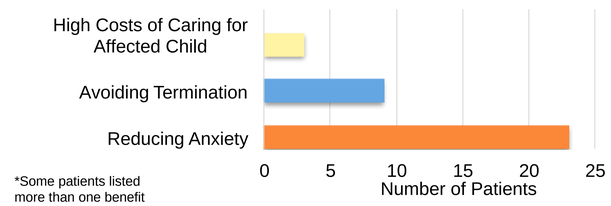
RESULTS

Demographics & Pregnancy History

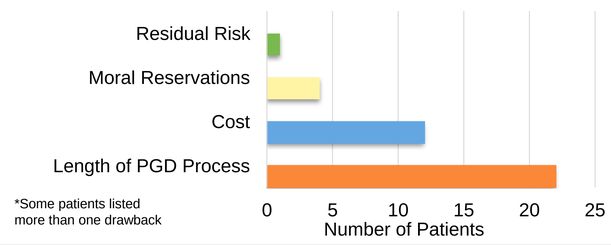
	Group 1: Carrier Screening (n=14) n (%)	Group 2: Prior Affected (n=14) n (%)
Demographics		
Sex of subjects	Female (100%)	Female (100%)
Mean age of subjects	34.6 years	33.2 years
Pregnancy history*		
Nulligravida	10 (72%)	0 (0%)
Spontaneous abortion	2 (14%)	3 (21%)
Stillbirth	0 (0%)	0 (0%)
Termination of pregnancy	0 (0%)	4 (29%)
Child(ren)	2 (14%)	9 (64%)
Status of child(ren)*		
Affected, living	0 (0%)	8 (57%)
Affected, deceased	0 (0%)	2 (14%)
Unaffected, living	2 (14%)	2 (14%)
Unaffected, deceased	0 (0%)	0 (0%)

*multiple responses from one individual

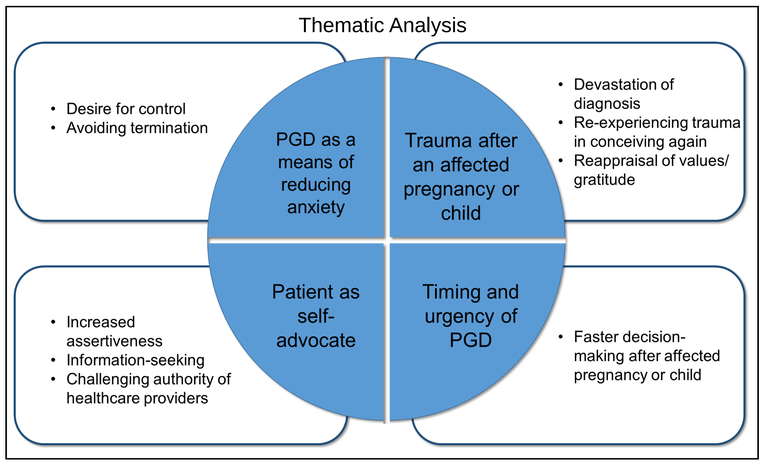
Perspectives on Benefits of PGD



Perspectives on Drawbacks of PGD



Thematic Analysis



DISCUSSION

This study of 28 individuals who had undergone PGD provides insight into the perceived benefits and challenges of the PGD process. Four recurrent themes were identified: drive to reduce anxiety, trauma, the urgency of the PGD process, and patients acting as self-advocates. With the exception of trauma, all themes came up in conversation with subjects in both groups. The results suggest that while PGD patients with previous pregnancy or child affected by a genetic disorder must deal with an additional emotional component during treatment, patients in both groups have similar concerns and reactions during the PGD process.

Patients with affected pregnancies or children often discussed the traumatizing nature of their previous experiences. For these individuals, the choice to pursue PGD was viewed as a protective mechanism, essential to avoiding future psychological harm. In addition, patients with affected pregnancies sought PGD over a shorter time frame than do patients identified as carriers on ECS, which is likely a reaction to the substantial emotional burden of prior events.

Previous studies have focused on cost as a deterrent to seeking PGD. While the financial cost of PGD was considered an obstacle to treatment by subjects, length of time for completing the PGD testing process was cited by more subjects as a drawback.

Twenty-five (89%) patients were satisfied with genetic counseling, while three patients desired additional post-test follow-up.

LIMITATIONS

- This study had a small sample size (n=28) due to a low response rate (25.2%), a common limitation of telephone-based surveys
- The diversity of genetic conditions and specific subject experiences limit the ability to draw generalized conclusions for all PGD patients
- No evaluation was performed to examine PGD treatment success in association with perceived benefits or satisfaction with genetic counseling

CONCLUSIONS

- The subjects in this study had a range of personal and reproductive histories. While individual experiences shaped some patient attitudes about the PGD process, overall, subjects in both groups expressed common themes surrounding their experience with PGD
- Having an affected pregnancy or child is a traumatic event for parents, who view PGD as a means to prevent additional suffering and pain
- The length of time required for the PGD process can be perceived as a drawback by patients. In this study, the length of the process was perceived as more disadvantageous than the cost of PGD.
- Genetic counseling that provides opportunities for patients to reflect on their experiences and ask questions, as well as post-test follow-up, is viewed as beneficial by PGD patients

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