Obstetrical Outcome among Pregnancies Conceived after Preimplantation Genetic Diagnosis (PGD)

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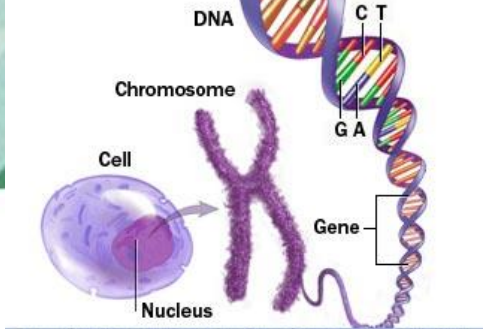
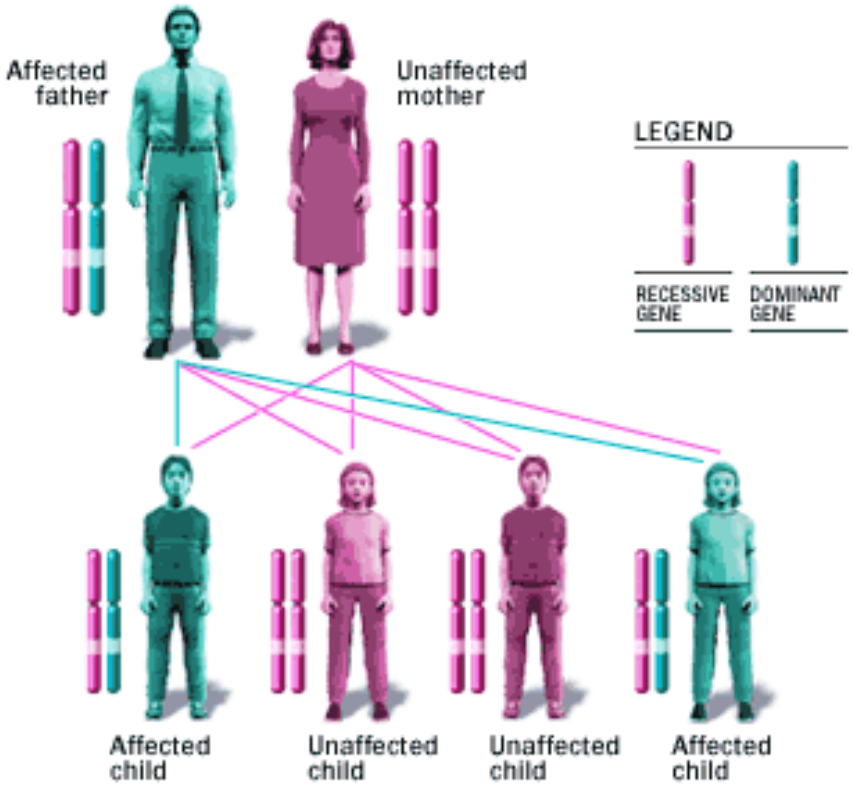
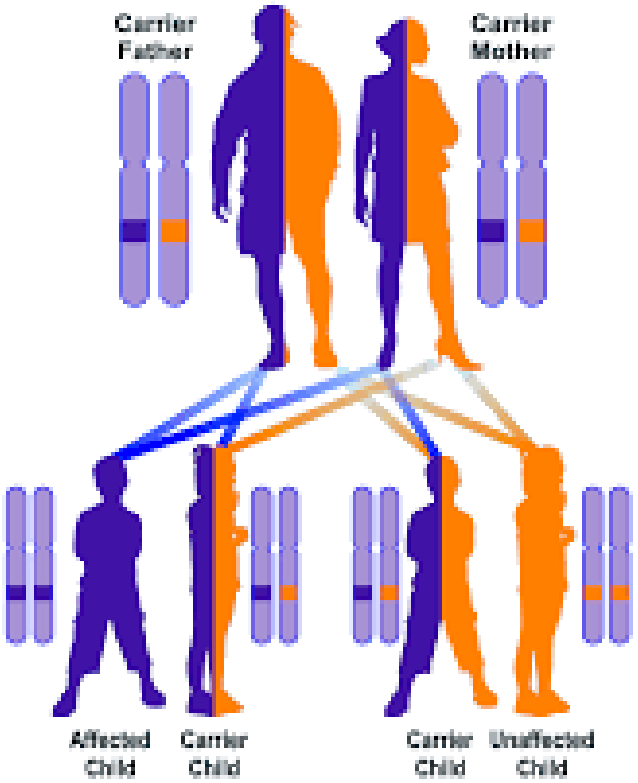


Genetic disorders

Autosomal dominant inheritance pattern



Autosomal Recessive



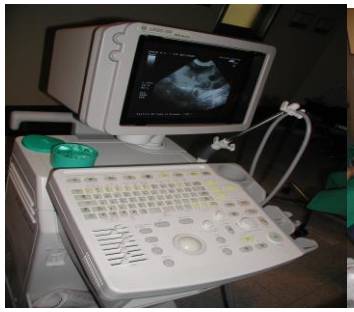
Pre-implantation genetic diagnosis (PGD)

PGD allows patients who are carriers of single-gene disorders or carriers of structural chromosome abnormalities (balanced translocations) to select unaffected embryos for transfer, and reduce the transmission of genetic disorders to the offspring.

Pre-implantation genetic diagnosis

- **PGD is considered in a similar fashion to prenatal diagnosis.**
- **PGD refers to the genetic profiling of embryos prior to implantation.**
- **PGD is an adjunct to assisted reproductive technology, and requires in vitro fertilization (IVF) to obtain oocytes or embryos for evaluation.**

IVF cycle

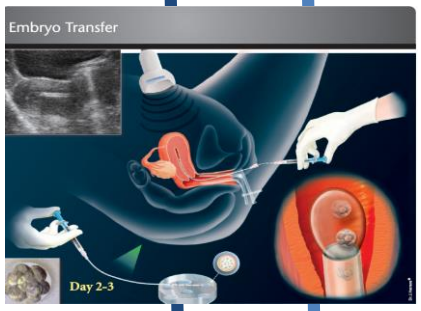


OPU

G

ET

gonadotropin administration



gonadotropin administration

administration

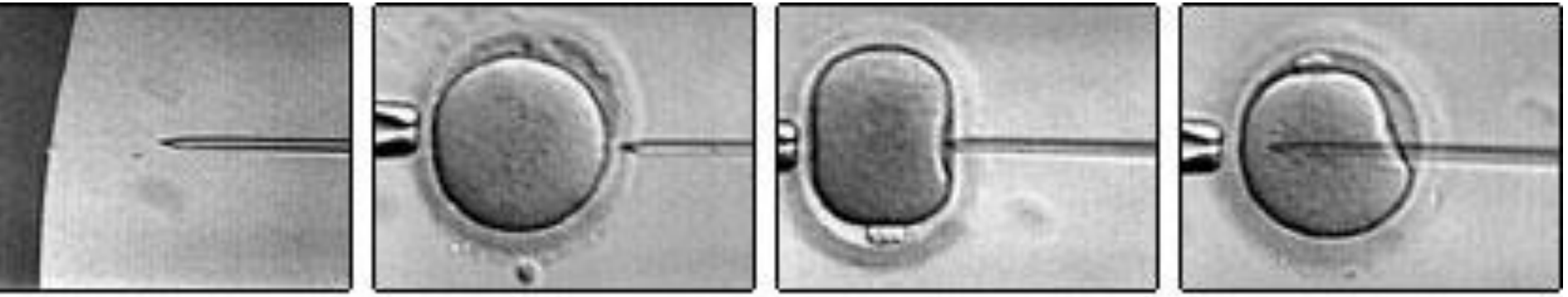
pre-

treatment cycle

Fertilization

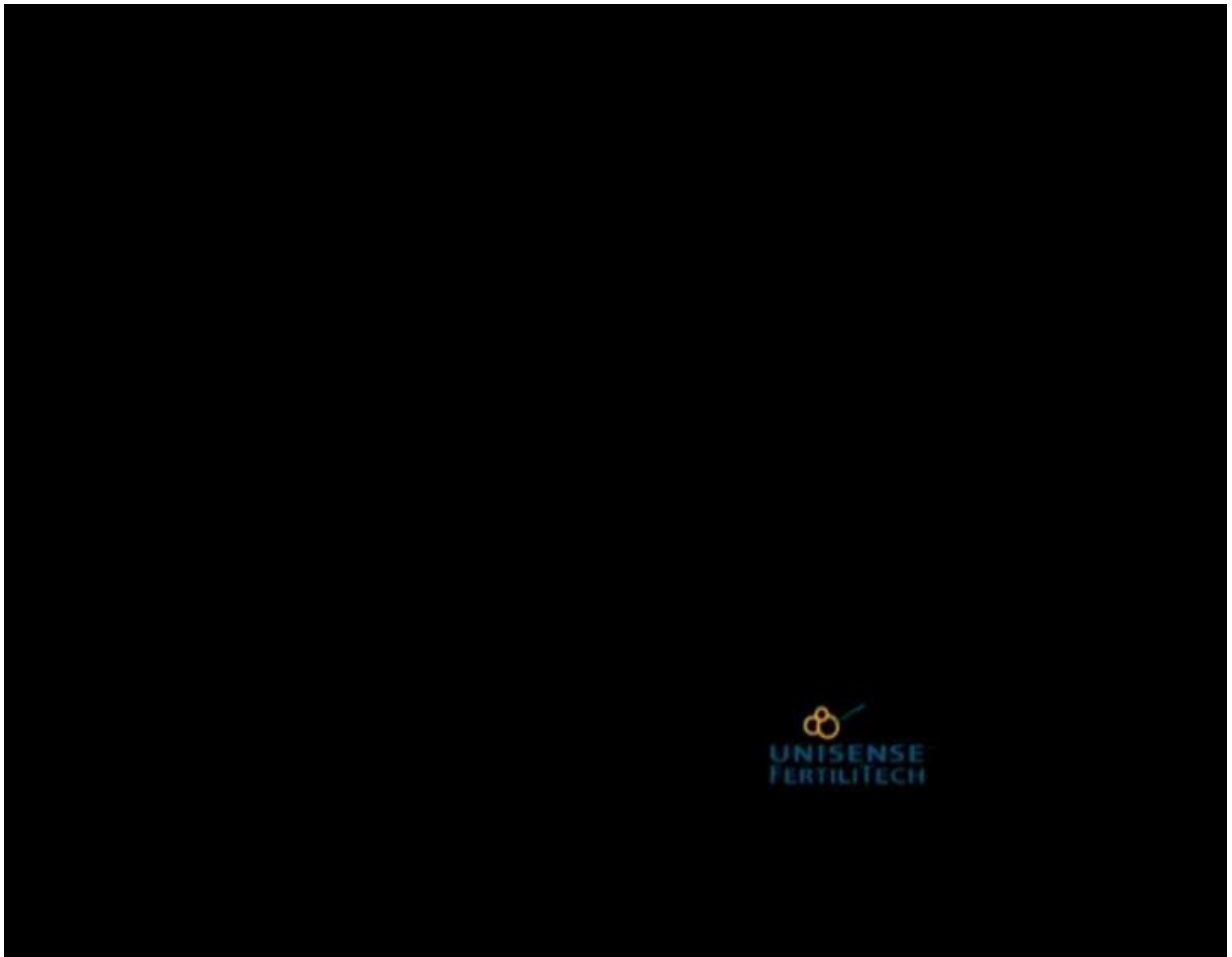
IVF

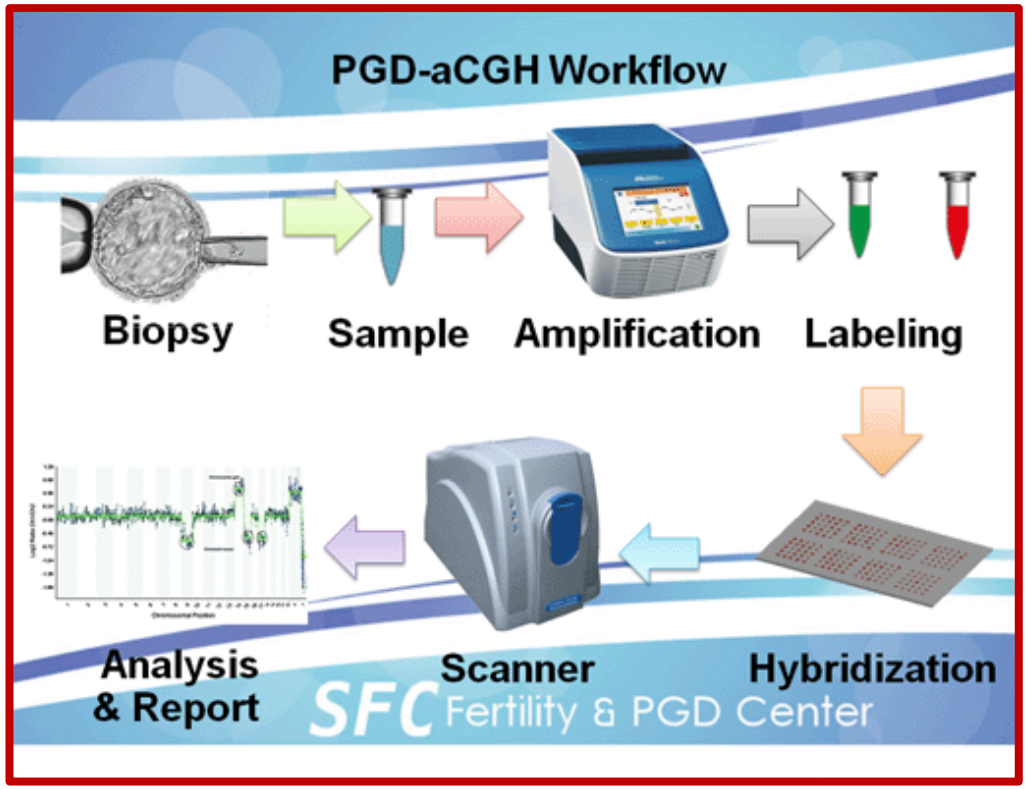
ICSI



A single sperm being picked up and injected into a mature egg.

IVF




PGD-aCGH Workflow
Biopsy
Sample
Amplification
Labeling
Analysis
& Report
Scanner
Hybridization
SFC
Fertility & PGD Center

Pregnancy outcome

O□56 Obstetrical outcome after preimplantation genetics

Ginsberg N, Tur-Kaspa I, Cieslak-Janzen J, Rechitsky S, Pauling D, Horwitz A, Kuliev A, Verlinsky Y
Reproductive Genetic Institute, Chicago, IL, USA

Abstracts - 6th International Symposium on Preimplantation Genetics 2005

Conclusions: The obstetrical outcome after PGD is similar to that of other IVF pregnancies. PGD significantly reduced the incidence of multiple gestations.

Neonatal follow-up of 995 consecutively born children after embryo biopsy for PGD 2012

S. Desmyttere[1,*], M. De Rycke[1], C. Staessen[1], I. Liebaers[1], F. De Schrijver[1], W. Verpoest[2], P. Haentjens[3], and Maryse Bonduelle[1]

995 children

No differences regarding mean term, prematurity (term <32 w and <37 w), mean birthweight, very low birthweight (<1500 g), perinatal death, major malformations and neonatal hospitalizations in singletons and multiples born following PGD versus ICSI were observed.

Neonatal outcome after preimplantation genetic diagnosis

Fertil Steril® 2014

Talia Eldar-Geva, M.D., Ph.D.,[a,b] Naama Srebnik, M.D.,[a,b] Gheona Altarescu, M.D.,[b,c] Irit Varshaver, M.Sc.,[a] Baruch Brooks, Ph.D.,[a] Ephrat Levy-Lahad, M.D.,[b,c] Ruben Bromiker, M.D.,[b,d] and Michael S. Schimmel, M.D.[b,d]

242 children born after PGD, 242 after ICSI and 733 after a spontaneous conception (SC).

Birth weight, pregnancy duration, and intrauterine growth for singletons.

	PGD	ICSI	SC	*P* value[a]
Birth weight (g)	3,238 ± 514	3,062 ± 573	3,204 ± 504	.005
<2,500 (%)	7 (4.4)	19 (12)	27 (5.5)	.01
<1,500 (%)	1 (0.6)	2 (1.3)	7 (1.4)	.7
Pregnancy duration (wk)	38.8 ± 1.8	38.4 ± 2.1	39.2 ± 1.9	.005
<37 (%)	11 (7)	18 (11.4)	28 (5.7)	.05
<34 (%)	2 (1.3)	5 (3.2)	10 (2.0)	.5
<32 (%)	1 (0.6)	2 (1.3)	8 (1.6)	.6
<28 (%)	1 (0.6)	0	1 (0.2)	.5
Intrauterine growth				.001
IUGR (<10th percentile)	8 (5.1)	15 (9.5)	27 (5.5)	
Normal weight (10–90th percentiles)	124 (78.4)	125 (79.1)	421 (85.7)	
LGA (>90th percentile)	18 (16.5)	26 (11.4)	43 (8.8)	

Pre-term birth and low birth weight following preimplantation genetic diagnosis: analysis of 88 010 singleton live births following PGD and IVF cycles

2017

Sesh Kamal Sunkara[1,*], Belavendra Antonisamy[2], Hepsy Y. Selliah[2], and Mohan S. Kamath[2]

Table II PTB and LBW outcomes following PGD versus autologous IVF.

Outcome	*n* (%)		OR (95% CI)	aOR[†] (95% CI)
	PGD *n* = 439	Autologous IVF *n* = 87 571		
PTB (<37 weeks)	28 (6.4)	7968 (9.1)	*0.68 (0.46–0.99)	*0.66 (0.45–0.98)
Early PTB (<32 weeks)	4 (0.9)	1512 (1.7)	0.52 (0.20–1.40)	0.48 (0.18–1.31)
LBW (<2500 g)	24 (5.5)	8138 (9.3)	*0.56 (0.37–0.85)	*0.58 (0.38–0.88)
Very LBW (<1500 g)	4 (0.9)	1580 (1.8)	0.50 (0.19–1.34)	0.50 (0.18–1.35)

Preimplantation genetic diagnosis: a national multicenter obstetric and

2016

Obstetrical and neonatal outcomes following preimplantation genetic diagnosis (PGD), in vitro fertilization/intracytoplasmic sperm injection (IVF/ICSI), and spontaneous conception (SC) with or without existing monogenetic disorders in the parents, Denmark 1999-2013.

Outcome	PGD[a] vs. IVF/ICSI[b]	PGD monogenic[c] vs. ICSI[d]	PGD monogenic[c] vs. SC[e]	PGD aberration[f] Vs. IVF[g]	PGD aberration[f] vs SC[e]	PGD monogenic[c] vs. SC monogenic[h]
Obstetrical						
Preeclampsia, odds ratio (95% CI)	1.2 (0.6; 2.4)	1.3 (0.5; 3.2)	1.2 (0.5; 3.2)	1.1 (0.4; 3.2)	1.2 (0.4; 3.3)	0.9 (0.4; 2.3)
Preterm primary rupture of membranes, odds ratio (95% CI)	1.3 (0.7; 2.4)	2.0 (0.9; 4.2)	2.1 (1.0; 4.4)[i]	0.6 (0.2; 2.0)	0.6 (0.2; 2.1)	1.4 (0.7; 3.1)
Placenta previa , odds ratio (95% CI)	2.1 (0.8; 5.8)	2.4 (0.6; 9.8)	9.4 (2.3; 38.7)[i]	1.8 (0.4; 7.4)	8.4 (2.0; 34.6)[i]	4.2 (1.1; 15.8)[i]
Abruption of placenta, odds ratio (95% CI)	1.2 (0.2; 8.3)	2.4 (0.3; 17.8)	3.6 (0.5; 26.4)	na	na	2.2 (0.2; 21.9)
Cesarean section, odds ratio (95% CI)	1.7 (1.1; 2.5)[i]	1.9 (1.1; 3.4)[i]	2.1 (1.1; 3.7)[i]	1.6 (0.9; 2.7)	2.0 (1.1; 3.5)[i]	1.4 (0.9; 2.2)
Induction of labor, odds ratio (95% CI)	0.9 (0.6; 1.5)	1.0 (0.5; 2.0)	1.2 (0.6; 2.2)	0.8 (0.4; 1.7)	1.0 (0.5; 2.0)	1.1 (0.7; 1.9)
Neonatal						
Gestational age (d), mean difference (95% CI)	−1.2 (−4.2; 1.8)	−5.1 (−9.1; −1.1)[i]	−6.3 (−9.5; −3.2)[i]	3.2 (−1.25; 7.7)	0.0 (−3.3; 3.3)	0.2 (−3.4; 3.8)
Preterm birth (<37 wk), odds ratio (95% CI)	1.3 (0.8; 2.1)	1.7 (0.9; 3.2)	1.8 (0.9; 3.5)	0.9 (0.4; 1.9)	1.2 (0.5; 2.8)	1.2 (0.6; 2.4)
Birth weight (g), mean difference (95% CI)	−10 (−115; 96)	−149 (−293; 5.4)	−178 (−311; −45)[i]	155 (1; 310)[i]	50 (−88; 189)	20 (−111; 151)
Low birth weight (<2500 g), odds ratio (95% CI)	1.2 (0.7; 2.0)	2.0 (1.1; 3.9)[i]	2.3 (1.1; 4.5)[i]	0.4 (0.2; 1.2)	0.5 (0.2; 1.5)	0.8 (0.4; 1.8)
Length at birth (cm), mean difference (95% CI)	−0.2 (−0.8; 0.4)	−0.9 (−1.8; −0.1)	−1.1 (−1.7; −0.4)[i]	0.6 (−0.2; 1.5)	0.3 (−0.4; 0.9)	0.6 (−0.2; 1.5)
Apgar score: *below 7 (%)*, odds ratio (95% CI)	1.1 (0.3; 4.3)	1.9 (0.5; 8.0)	1.8 (0.5; 8.0)	na	na	0.5 (0.1; 3.3)
Neonatal admission, odds ratio (95% CI)	0.9 (0.5; 1.5)	1.4 (0.8; 2.6)	1.4 (0.8; 2.7)	0.4 (0.2; 1.1)	0.5 (0.2; 1.3)	1.2 (0.2; 2.4)
Length of neonatal admission (d), mean difference (95% CI)	20 (13; 27)[i]	30 (22; 39)[i]	31 (24; 38)[i]	−9 (−24; 5)	−7 (−19; 5)	13 (−11; 38)
Malformations, odds ratio (95% CI)	1.5 (0.9; 2.5)	1.3 (0.6; 2.8)	1.3 (0.6; 2.8)	1.7 (0.8; 3.6)	1.8 (0.8; 3.8)	1.2 (0.6; 2.2)
Stillbirth, odds ratio (95% CI)	na	na	na	na	na	na
Perinatal death, odds ratio (95% CI)	na	na	na	na	na	na
Infant death, odds ratio (95% CI)	na	na	na	na	na	na
Placenta weight (g), mean difference (95% CI)	13 (−21; 49)	−37 (−86; 12)	−17 (−54; 19)	68 (19; 119)	71 (33; 109)[i]	60 (25; 97)[i]

700 PGD pregnancies

Oocyte- IVF/ICSI-Day3/4/5Bx-FISH/PCR/CMA
Oocyte/embryo quality

Pregnancy (maternal and neonatal) outcomes- ……Incomplete

14