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human reproduction LETTER TO THE EDITOR

Which blastocysts should be considered for genetic screening?

Given the exciting rapid evolution of genetic technology we, along with many others, are contemplating the idea of preimplantation genetic screening of all blastocysts. In this context we were interested in the recent paper by Fiorentino *et al.* (2014). They reported on the application of both array-comparative genomic hybridization (CGH) and next generation sequencing (NGS) using instrumentation from Illumina, Inc. They showed 99.5% concordance between the two technologies and 38.5% of embryos having trophectoderm biopsy proved euploid. Following the transfer of 50 screened embryos in 47 women, they had 32 clinical implantations (64.0%) with all those cases proceeding to live births.

Before expending the rather large financial outlay in setting up similar technology in our own facility, we would like to initiate a debate by presenting data showing that morphological assessment of blastocysts can provide similar high implantation rates. Our data, which is supplemental to a larger study (Yovich *et al.*, 2015), question the relevance of applying the advanced genetics in facilities that already have high implantation rates.

Table I shows the implantation rates from 529 single embryo transfers in a hormone controlled cycle where vitrified embryos were warmed utilizing the Cryotop method (Kuwayama *et al.*, 2005). It can be seen that those embryos graded 4AA or 5AA on morphological criteria according to Gardner and Schoolcraft (1999) implant at 63–65% level; i.e. equivalent to the genetically screened embryos reported by Fiorentino *et al.* Figure 1 shows the regression line for blastocysts of all gradings, indicating that there is a reliable predictive value in these gradings ($R^2 = 0.9715$).

Table I Clinical pregnancies and live births according to blastocyst grading categorized from lowest to highest pregnancy rate following single embryo transfer.

Blastocyst scores	6BB	6BA	6AB	4BB	5BB	3BB	6AA	5BA	3BA	3AA	5AB	4AB	4BA	3AB	5AA	4AA	Total
Blastocyst groups	Low group <30%			Modest group 30–39%			Medium group 40–49%					High group 50–59%			Top group 60–69%		
# CP	0	0	0	13	4	8	2	10	6	13	12	46	24	41	37	55	271
# Transfers	2	2	2	41	12	22	5	23	13	28	25	89	45	76	59	85	529
PR	0%	0%	0%	32%	33%	36%	40%	43%	46%	46%	48%	52%	53%	54%	63%	65%	51%
# LB	0	0	0	10	1	5	1	8	2	6	7	36	19	32	31	47	205
LB rate	0%	0%	0%	24.4%	8.3%	22.7%	20.0%	34.8%	15.4%	21.4%	28.0%	40.4%	42.2%	42.1%	52.5%	55.3%	39%

The blastocyst groups are categorized according to implantation rates. Data derived from Yovich *et al.* (2015).
CP, clinical pregnancy; PR, pregnancy rate; LB, live birth.

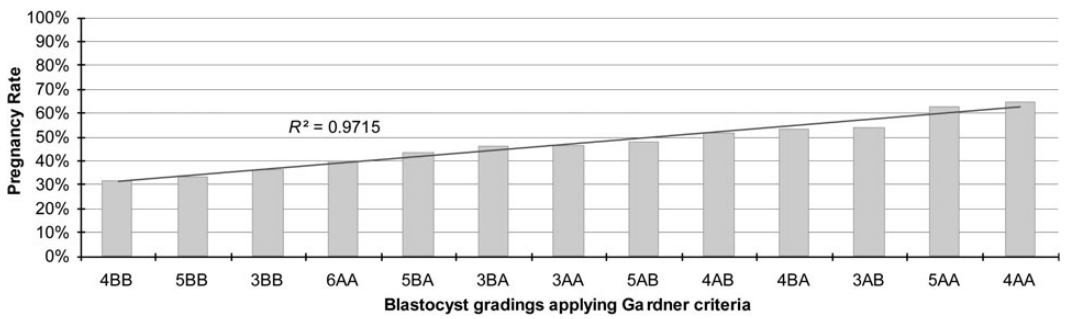

Figure 1 Pregnancy rate from single vitrified blastocyst transfer according to post-warm blastocyst grading at time of transfer, categorized from lowest to highest implantation ratings. Three groups excluded with no pregnancies from six transfers—hatched blastocysts 6BB, 6BA and 6AB. Data derived from Yovich *et al.* (2015).

Perhaps only those embryos graded in the Modest to Medium groupings should be considered for genetic screening. Blastocysts categorized in the High group and Top groups will not benefit from screening as the chance of a healthy live birth is not improved.

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