

Comprehensive chromosome screening (CCS) improves IVF outcome in recipients suffering from repeated implantation failure (RIF) and recurrent pregnancy loss (RPL).

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INTRODUCTION

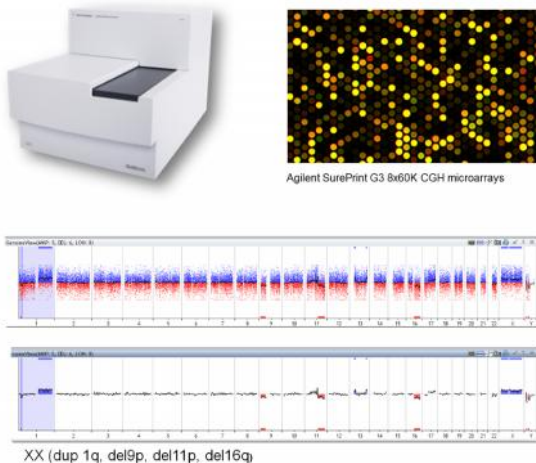
Embryo chromosomal aneuploidy is the most common cause of unsuccessful pregnancy after IVF in RPL and RIF patients. The development of CCS has offered valuable insight into the chromosomal status of human gametes and preimplantation embryos. Applied as a therapeutic tool, it could improve implantation and live birth rates of in-vitro fertilization treatments and provide a means of attenuating pregnancy loss in recurrent pregnancy loss patients and increase implantation rate in recurrent implantation failure patients.

RESULTS

Results from D5-CCS were obtained in the 99.5% of the biopsied embryos (310/312). To summarize, the average of biopsied embryo per egg donation cycle was 3.4. The positive beta-HCG was 58.5% and the implantation rate was 43.5%. The miscarriage rate was 10%. The aneuploidy rate in Day 5 embryos from recipients was 30.1% and the majority (70%) showed aneuploidy only in one chromosome. An increase in the implantation rate in RIF and RPL patients to be equal to control patients was reported (41.3% vs 47.1%, $p=0.578$). Previous results in egg donation RIF and RPL recipients in 50 cycles performed before without CCS showed an implantation rate of 25% ($p<0.05$).

METHODS

A retrospective study was performed. We included the array-CGH results of 312 embryos (211 RIF and RPL and 101 controls) from 60 RIF and RPL patients and 31 controls performing CCS cycles in 2013 and 2014 at Instituto Bernabeu (Alicante, Spain). After discarding known causes, we define RIF if a total of four cleaved good quality embryos transferred failed to implant. RPL was two or more miscarriages. ArrayCGH analysis of the biopsied trophoectoderm on day5, was performed using Agilent-SurePrintG3-8x60K. The main outcome measures were biochemical pregnancy, implantation rate and ongoing pregnancy.



| | CONTROL | RIF AND RPL |
|--------------------------------|-------------|-------------|
| CYCLES | 31 | 60 |
| TRANSFERRED CYCLES | 31 | 55 |
| BIOPSED EMBRYOS | 101 | 211 |
| FEMALE AGE (y) | 25.9 | 25.3 |
| MALE AGE (y) | 42.0 | 43.1 |
| Average of biopsied embryos | 3.3 | 3.5 |
| % Aneuploidy rate | 30.5 | 29.4 |
| Non result | 0.5 | 0.5 |
| Average of transferred embryos | 1.1 | 1.4 |
| % B-HCG + | 61.3 | 54.6 |
| Clinical pregnancy rate | 41.9 | 43.6 |
| Miscarriage rate | 0 | 16.7 |
| Implantation rate (%) | 47.1 | 41.3 |

CONCLUSIONS

This investigation reveals a high aneuploidy rate in a population of recipients suffering from RIF and RPL. Application of CCS in these patients is a promising tool. CCS in embryos from an egg donor program could be beneficial as the euploid selection and allowing single-embryo-transfer without decreasing the baby-take-home rate. CCS applied as a therapeutic tool could improve implantation and live birth rates of in-vitro fertilization treatments mainly in RPL and RIF patients.