Explaining the shortcomings of PGS/PGT-A

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The hypothesis of preimplantation genetic diagnosis (PGS) was first proposed 20 years ago, suggesting that elimination of aneuploid embryos prior to transfer will improve implantation rates of remaining embryos during in vitro fertilization (IVF), increase pregnancy and live birth rates and reduce miscarriages. Recently, the utilization of trophectoderm biopsy combined with comprehensive chromosome screening (CCS) tests for embryonic aneuploidy was suggested to further improve IVF outcome, however, not without criticisms. Various reports over the last 2 years have raised significant questions not only about the basic clinical utility of PGS but also about the technical ability of a single trophectoderm (TE) biopsy to accurately assess an embryo's ploidy, and suggested that PGS actually negatively affects IVF outcomes while not affecting miscarriage rates. Moreover, due to high rates of false positive diagnoses as a consequence of high mosaicism rates in TE, PGS leads to the discarding or large numbers of normal embryos with potential for normal euploid pregnancies if transferred rather than disposed of. Moreover, the ongoing discussion on the unrestricted clinical adoption of preimplantation genetic screening (PGS) has called for a proper randomized controlled trial (RCT), aiming to further evaluate the cumulative live birth rates (LBRs) following a single oocyte retrieval, utilizing all fresh and frozen embryos. Since this

study seems not to appear for various reasons, we present herewith, the hypothetical required RCT based on the hitherto published literature. After implementing data from the hitherto published literature on blastulation and aneuploidy rates, the rate of mosaicism and technical errors and implantation rates/LBRs of non-PGS day-3 and blastocyst and PGS blastocyst, we could clearly demonstrate the superiority of non-PGS embryo (day-3 and blastocyst) transfer over PGS blastocyst transfer, in terms of cumulative LBR (18.2–50 % vs 7.6–12.6 %, respectively). We therefore believe that until the proper, non-hypothetical RCT on the efficacy of this procedure will appear, PGS should be offered only under study conditions, and with appropriate informed consents.