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COMPARISON OF EMBRYO QUALITY AND EUPLOIDY RATE USING TWO DIFFERENT TIMELAPSE SYSTEMS AND A BENCHTOP INCUBATOR IN THE SAME IVF LABORATORY.

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OBJECTIVE: Our aim was to analyze embryo quality and euploidy rate using different incubation conditions: two time-lapse systems (TS) with different features and a conventional benchtop incubator (CI), all systems co-existing in the same IVF laboratory.

DESIGN: Retrospective Cohort Study.

MATERIALS AND METHODS: We examined 4010 cycles with deferred embryo transfer. Patient's embryos were cultured either in the Embryoscope (ESD) (n¼1448), GERI (n¼119) or in an ASTEC benchtop incubator (CI) (n¼2443). For CI cycles, embryos were removed from the incubator only on day 1 for fertilization check, on day 3 for media change and on day 5 for blastocyst formation/quality check. Embryos on ESD and Geri were never removed, although culture conditions were different: for ESD all patients shared the same incubator whereas in GERI each patient was cultured in an individual chamber. Good quality blastocysts were defined as those presenting A or B inner cell mass (ICM) and/or trophoectoderm (TE) according to Gardner's classification. In addition, the percentage of euploid embryos was analyzed using next generation sequencing (NGS).

RESULTS: No significant differences were observed for patient's demographics between the three groups (including age, BMI and sperm concentration). Table 1 shows the proportion of viable, good quality and euploid blastocysts according to the type of incubator.

CONCLUSIONS: The distribution of good quality and euploid blastocysts differs significantly according to the incubation conditions. There are more good quality embryos in both time-lapse systems, ESD and GERI, than in CI. There are more euploid embryos in GERI than in ESD and CI. Although clinical outcome was not analyzed due to the limited sample size we could speculate that a higher amount of good quality euploid embryos could be obtained when undisturbed culture conditions are used. ESD GERI CI P-value
Viable Blastocysts 43,8% (6171/14022) 42,1% (553/1313) 41,4% (8562/20678) < 0,001
Good Quality Blastocysts 25,8% (3614/14022) 27,9% (366/1313) 22,1% (4573/20678) < 0,001
Euploid Blastocysts 42,4% (776/1832) 47,2% (77/163) 41,3% (1366/3307) < 0,001