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A retrospective study on time lapse culture under low oxygen concentrations VS variable oxygen concentrations

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Introduction:

The objective of this study is to check if we find differences between human embryos cultured under 7% oxygen and variable oxygen atmospheres (7% and 20%) by observing the embryo quality and the b-HCG results.

According to many studies, uninterrupted culture is superior compared to the interrupted incubation culture system. The impact of variable oxygen concentrations (7% = optimal and 7%-20% = stressed) during embryo culture was already assessed. However, there is still some uncertainty on the development of the subsequent pregnancy.

Materials and methods:

Human embryos obtained after ICSI procedure were used for this study. To evaluate impact of oxygen concentration on embryos, we chose only embryos with quality A or B (according to ASEBIR criteria) and we have considered the b-HCG results of each cycle. The uninterrupted culture was assessed using the time lapse incubator (Geri, Genea Biomedx, 7%), while the variable oxygen concentrations culture using the time lapse incubator (Embryoscope, Embryo Monitoring System, 7%) and a standard incubator (20%).

Results:

During the entire procedure, the first group (178 cycles) was cultured only at 7% (low oxygen concentration) and the second group (209 cycles) at two different oxygen concentrations (20% during pre-fertilization and pre-transfer; 7% during embryo culture). Moreover, we divided each group in 2 subgroups: homologous and heterologous embryos (own and donated oocytes, respectively). These subgroups were also subdivided in two age ranges (19-36 and 37-50 years). The only difference we found was in the group of heterologous embryos, in particular in the range of 19-36 years. In this subgroup, we observed best results in term of positive b-HCG (63% vs 30%) when we had variable oxygen concentrations.

Conclusions:

These findings don´t demonstrate significant differences except in the heterologous group (19 to 36 years). It would be necessary to increase the sample size (number of cycles) to check if the differences found are significant. It would also be advised to confirm if this procedure also has an effect on the pregnancy development or in further neonatal parameters.