# LOW OXYGEN CONCENTRATION FOR CULTURE OF HUMAN EMBRYOS IN ASSISTED REPRODUCTIVE TECHNOLOGIES.

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**Abstract Body**

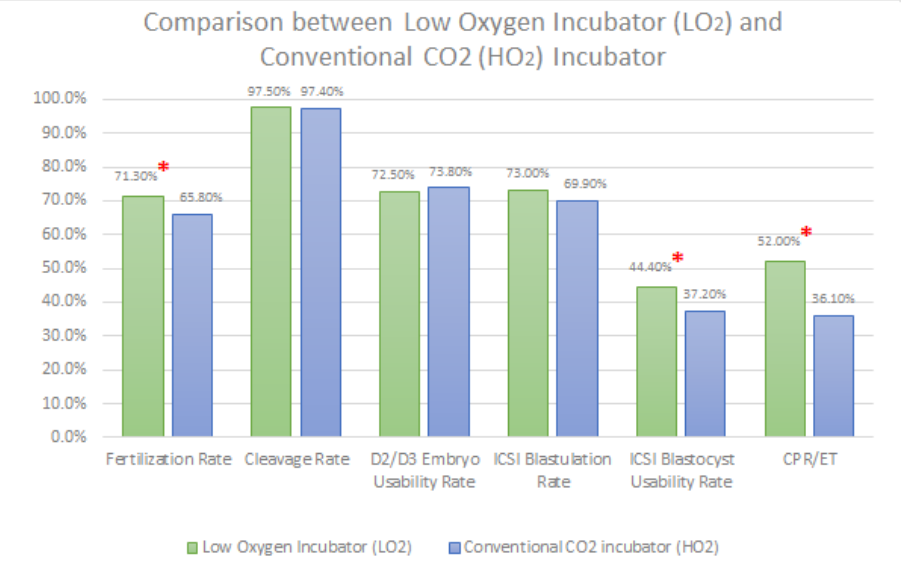
**Introduction:**
Numerous research and development have been carried out over the years in order to improve the quality of the culture environment for human embryos. Historically, embryos were cultured with atmospheric oxygen concentration (20%) ($HO_2$). Over the years, there has been a shift in practice to use lower oxygen concentration (5%) ($LO_2$) to simulate closely to the oviduct and uterus. In this study, comparison between cultures in $LO_2$ versus $HO_2$ incubators was performed and clinical outcome recorded.

**Methodology:**
Retrospective study (January 2016 to December 2016) was conducted in KKIVF centre to compare the embryo development and clinical outcomes using $LO_2$ and $HO_2$ ($LO_2$; n=232, and $HO_2$; n=297). All embryos were cultured in Global Total® medium layered with oil. Data was subjected to chi-square test for significance at p-value<0.05.

**Results:**
There was significant difference observed in fertilization rate between $LO_2$ and $HO_2$ (71.3%, 65.8%; p= 0.0001); Intracytoplasmic Sperm Injection (ICSI) blastocyst usability rate (44.4%, 37.2%; p=0.006) and clinical pregnancy rate (52.0%, 36.1%; p=0.04). However, no significant difference seen in cleavage rate (97.5%, 97.4%; p=0.862), day two and three embryo usability (72.5%, 73.8%; p=0.468) and ICSI blastulation rate (73.0%, 69.9%; p=0.202).

**Conclusion:**
Constant optimisation of the culture environment remains the most important for the IVF laboratory as embryos spend most of their time in the incubators. Culturing in $LO_2$ environment is more conducive for optimal embryo culture and clinical outcomes. However, a follow up study with larger cohort will be conducted to confirm our findings

**Abstract image**




| | Low Oxygen Incubator ($LO_2$) | Conventional CO2 incubator ($HO_2$) | P- value (*) |
|---|---|---|---|
| **Fertilization Rate** | 71.30% [1324/1856] | 65.80% [1608/2442] | 0.0001* |
| **Cleavage Rate** | 97.50% [1282/1315] | 97.40% [1566/1608] | 0.8620 |
| **D2/D3 Embryo Usability Rate** | 72.50% [930/1282] | 73.80% [1155/1566] | 0.4680 |
| **ICSI Blastulation Rate** | 73.00% [498/682] | 69.90% [481/688] | 0.2020 |
| **ICSI Blastocyst Usability Rate** | 44.40% [303/682] | 37.20% [256/688] | 0.0060* |
| **CPR/ET** | 52.00% [39/75] | 36.10% [30/83] | 0.0447* |