Assisted Reproduction in Homosexual Couples: Options and Limitations

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I. INTRODUCTION

Assisted Reproductive Technologies (ART) are an option to have children couples with fertility alterations. Moreover, homosexual couples see in ART a way to bring their children’s genetic parents. Nevertheless, we have to accept that with the existing technologies, only one of the parents in the homosexual couple can be the genetic mother or father. This project’s objectives are to explain those ART that can be applied to homosexual couples, explain the biological reason why two same sex people can not reproduce, and present the present techniques, describe the legislation regulating these ART, and contextualize with social concerns regarding homoparental families created through ART.

II. METHODS

Research in the bibliography and synthesis of information to elaborate an informative project.

More information in:
http://agusaless.wix.com/homoparental

III. OPTIONS

**MALE COUPLES**

- Artificial insemination (AI)
  - Traditional surrogacy
    - With the surrogate’s oocyte
    - AI with sperm from the couple
    - So...
    - Surrogate is disposed to donate her oocytes and no IVF is needed

- In vitro fertilization (IVF)
  - Oocyte donation
  - IVF with sperm from the couple
  - So...
  - Surrogate is disposed to gestate but without genetic linkage

If a few embryos are obtained from both parents’ sperm and transferred, half genetic siblings could born.

**FEMALE COUPLES**

- Artificial insemination (AI)
  - Introduction of sperm into the woman's genital tract
  - Using donor sperm
  - So...
  - Using in the second pregnancy the same sperm donor used in the first one, or inseminating both women at the same time with the same sperm donor, then in both situations children would be half genetic siblings.

- In vitro fertilization (IVF)
  - IVF with
    - Donor sperm
    - One partner oocytes
    - Embryo transfer to the other partner
  - ROPA (Reception of Oocytes from Partner)
  - So...
  - Both women can be mothers:
    - One genetic mother
    - One gestational mother
  - Shared motherhood

IV. LIMITATIONS

- Development inhibition caused by the lack of paternal genome
- Imprinting phenomenon
  - Caused by: Derivation
  - Mechanism: Expression of a set of genes only from one parental genome
  - Expression
  - DNA methylation
  - Histone modifications
  - Gene expression, expression and repression
  - Determines specific differentiation properties of individual cells
- No formation of extraembryonic and mesodermal tissues
- Parthenogenesis phenomenon
  - Human parthenotes:
    - Early development similar to fertilized oocytes and similar blastomere number
    - Unable to develop to term → Lack of paternal imprinting
  - Conditions:
    - Sperm from the same donor
    - Only for AI

V. FUTURE PERSPECTIVES

- Hypothetical situation
- Derivation
- Obtaining
- From: Embryo genetically related to two women
- To: Primordial germ cell-like cells
- IPSC
- MPSC
- Hypothetical situation
- In mice
- Imprinting marks erasing
- Paternal methylation
- Pattern reestablishment
- Embryo genetically related to two women

VI. CONCLUSIONS

- ART are applicable to homosexual couples regardless of each person’s ethical concerns.
- International regulation about ART would need in order to avoid uncomfortable situations to CBRC patients, as each country laws are different.
- With the existing techniques is not possible to obtain embryos genetically related to two same sex people. If technologies some day would permit it:
  - A laboratory work would be always needed
  - Male couples still would need surrogacy