Are Muslims into stem cell research?
Review of current available literature

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No Disclosure
What are the types of human stem cells?

• **Totipotent cells**

  These are the cells that can generate a complex organism, be it animal or human, but they cannot self regenerate. These are the embryonic cells beginning with the zygote until the 8-cell morula stage.
What are the types of human stem cells?

- **Pluripotent cells**

These cells retain the capacity to transform into all three primary germ layers i.e., the endoderm, mesoderm, and ectoderm and, therefore, can still form a complex organism. They can — in contrast to the totipotent cells — self renew, for example in tissues culture. These are the cells of the inner cell mass of the blastocyst and constitute what are usually called embryonic stem cells (ESCs).
What are the types of human stem cells?

- **Multi-potent and progenitor cells**

These cells in the developing embryo are the descendants of the inner cell mass. They are already differentiated and develop in specific types of cells e.g. blood cells, liver cell, cardiomyocytes, neurons, etc., and eventually make the different body organs.
Six Principles of Use of Human Stem Cells in Research

**Option 1**
No human embryo research is permitted, and no explicit permission is given to perform research on existing human embryonic stem cells.

**Option 2**
Research is permitted only on existing human embryonic stem cell lines, not on human embryos.

**Option 3**
Research is permitted only on remaining embryos no longer needed for reproduction.

**Option 4**
Research is permitted both on remaining embryos (see Option 3) and on embryos created specifically for research purposes through *in vitro* fertilization (IVF).

**Option 5**
Research is permitted both on remaining embryos (see Option 3) and on embryos created specifically for research purposes through somatic cell nuclear transfer into human eggs or zygotes (therapeutic cloning); and

**Option 6**
Research is permitted both on remaining embryos (see Option 3) and on embryos created specifically for research purposes through the transfer of human somatic cell nuclei into nonhuman animal eggs, for example, rabbit eggs.
Purpose of the study…

1; To explore the available medical literature relating to views of Muslims on the use of stem cells in research.

2; To investigate the status of national legislations/laws in Muslim countries, as listed in pub med.
Method

A Pub med search…..

Muslims
- Stem cell research ethics
- Stem cell research controversies
- Embryonic stem cells research ethics
- Stem cell research ethical

Islam
- Stem cell research ethics
- Stem cell research controversies
- Embryonic stem cells research ethics
- Stem cell research ethical

Arabs
- Stem cell research ethics
- Stem cell research controversies
- Embryonic stem cells research ethics
- Stem cell research ethical
General Features of the Articles
Results/ Journals

• A total of 16 articles were obtained.
• First article is on March 2004 was and last one on March 2012.
• On average 2 articles/yr.
• Thirteen articles (81.25%) were published in international journals and 3 (18.75%) in regional journals
  • Saudi Medical Journal; n=2,
  • Eastern Mediterranean Health Journal; n=1
• Nine journals with impact factor, ranging from 3.986-0.51
  • American Journal of bioethics; 3.986
  • Most of which is in intermediate range impact factor (1.046-1.256).
Results/ Article

Type of articles:

Ten (62.5%) review articles.

Three (18.25) original articles

Two (12.5%) commentaries.

One (6.25%) editorial.

Reviews 2-36 pages

Original articles 5-11 pages

Commentaries 1-4 pages

Editorial 3 pages

Pages ranged from 1-36 pages.
Results/ Authors

**Ten**
from institutions within Muslim countries

- Iran—4
- Turkey---3
- Saudi Arabia---2
- Sudan---1

**Six**
from institutions in other countries

- USA---2
- Italy—1
- Brazil---1
- Lithuania—1
- Germany--1

Six from institutions in other countries
Contents of Articles
Perspective of discussion

• Three articles (18.75%) addressed the issue of Islamic perspective as part of international reviews, in comparison with other regions like Christianity, Judaism, Hindu and others.
• Seven articles measured the Islamic perspective in general
• Five articles measured the views in relation to a specific country
  • Iranian; n=3.
  • Turkish; n=2.
Results

• There is a general agreement by Muslim scholars on the acceptance of the use of stem cells in research.

• There is a general agreement on the source of stem cells, whether from embryonic, fetal, children or adult sources.

• General agreement on the acceptance of embryo as a “non-human being”.

• Reproductive cloning is prohibited.
Conditions on use of stem cells in research …

- Adult stem cells can be used without causing harm to patients and with their consent.
- Children stem cells can be used without causing harm to patients and with parents permission.
- Fetal stem cells can be used in spontaneous abortion, with permission of the parents but prohibited in research-induced abortion.
- Research on remaining (supernumerary) embryos resulting from IVF no longer needed for reproduction provided
  - Embryos were not produced specifically for research.
  - AND parents consent to their use in research.
- Placenta and blood cord stem cells.
Conditions on use of stem cells in research

- Therapeutic cloning (Somatic cell nuclear transfer)
  - When the intent is to create tissue/organ from the individual who needs it.
  - The procedure is feasible.
  - The result is expected to be good.
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Sources of references used in most articles

- Holy Quran
- Hadith
- Ijtihad (independent judgment) to reach an opinion or (Fatwa):
  - Ijma (consensus)
  - Qiyas (analogy)
  - Istihsan (juristic preference)
  - Maslaha (public interest)
Points of controversies…

Moral status of the embryo
Points of controversies…

“Moral status of embryos”

- There is no specific definition of the beginning of life either in the Quran or the ḥadīṯ collections.

- It is generally agreed that ensoulment, the breathing of Allah’s rūḥ (spirit) into the fetus, differentiates biological life, which starts at the time of fertilization, from human life.
Points of controversies

“Moral status of embryos”.

What is the day of ensoulment in embryo?
• 40 days
• 42 days
• 48-50 days
• 80 days
• 120 days

What is the ethical relevance of ensoulment?
• Categorical versus gradual change.
• Biological versus human life.

What is the relation to “Primitive streak”?
• Head from tail and right from left
• Organs start to develop

What is the relation to implantation?
• Pre-embryo “≤ 14 days after fertilization” versus
• Personhood “≥ 14 days after fertilization”
Clear national guidelines and regulations on the use of stem cells in research are available only in two Muslim countries; Iran and Turkey.
In Iran

- One of the first countries that has produced hESCs in 2003.
- National and Regional Committees for Medical Research Ethics, and the production of National Codes of ethics in Biomedical Research in 1990.
- The introduction of a comprehensive strategic plan for medical ethics at national level in 2002,
- The production of the specific National Ethical Guidelines for Biomedical Research in 2005.
  - (Larinjani B et al, Dev World Bioeth 2008, Dec)
In Turkey

- 1960; Medical Deontology Regulations by Turkish Ministry of Health
- 1998; Patients’ Right Regulations by Turkish Ministry of Health
- 2005; Ministry of Health stopped the “Embryonic Stem cell research”
- 2006; “Regulations for Clinical Research”
  - “Guidelines for Clinical Research on Non-Embryonic stem Cells”, which was a general regulation that allowed "Adult Stem cell Research“.
  - (Arda B et al. Stem Cell Rev, 2009)
However….

• None of the articles explored scientists or public opinion, perception or understanding of the use of stem cells in research!!!
Conclusion

- There is general agreement by the majority of Muslim scholars on the use of stem cell in research.

- International literature is still poor when it comes to measuring scientists and public views.

- National regulations/legislations are urgently needed in most Muslim and in particular Arab countries.
References

• Hug K. Therapeutic perspectives of human embryonic stem cell research versus the moral status of a human embryo--does one have to be compromised for the other? Medicina (Kaunas). 2006;42(2):107-14.
Thank you