

Stem Cell Research: An Afro-Cultural Evaluation

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Abstract

Stem cells are undifferentiated biological cells that can differentiate into specialized cells, divide to produce other cells and have been found useful in curative, preventive and regenerative medicine. While some have argued for sustained researches using stem cells because of their curative and regenerative abilities, many others have countered-argued primarily because they believe the embryo is a potential source of life that should not be destroyed because of seemingly medical usefulness. This has generated controversies on the moral status of the embryo, the propriety of using cells obtained from embryos for research, the use of stem cells for therapeutic cloning, the place of human experimentation in African culture and the African view towards modern medical technologies. Moreover, is it just to destroy an embryo cell if it has the potential to cure many more people? Are human embryos means to an end? This paper argues that adult stem cells should be induced with pluripotent capacity and should be used as means of obtaining stem cells for research instead of embryonic stem cells because the use of adult stem cells is less controversial. This paper concludes that Africans should stop living in the shadows of the past and adjust to the current trends in the new global medical advances.

Keywords: Stem Cells, Human Embryo, Embryonic Stem Cells, Adult Stem Cells, African Ontology, African Culture.

Introduction

The ability to detect and treat disease has achieved a new dimension in modern science. The increasing knowledge of the human genome has made possible a new era of medical knowledge and is the beginning of an epoch in general medicine. With ever-increasing incursion into hitherto 'mysterious' aspects of human genetics and some underlying composite of human anatomy and physiology, science has gained insight into some of the most deadly diseases that threaten us as humans. Regenerative medicine is the most recent and emerging branch of medical science that deals with functional restoration of tissues or organs for the patient suffering from severe injuries or chronic diseases. (Ranjeet Singh Mahla 2016)

One of such medical technologies that have given humans mastery over one of the impediments to a prolonged life is stem cells. Stem cells are cells that can divide to produce cells

like themselves or cells of one or several differentiated types (Hansen and Schotsmans 2004, 367). Stem cells have unique regenerative abilities and for this reason, offer new potentials for treating diseases such as diabetes, heart disease as well as the development of organs for transplant purpose among other uses with wide range medical benefits. (Sachin Kumar, N.P. Sigh 2016: 16) Additionally, it offers immense hope of curing Alzheimer's disease, repairing damaged spinal cord, treating kidney, liver and lungs diseases and making damaged hearts whole. (Jinbuichen, Libing Zhou, Su-yue Pan, 2014: 9) Though of great importance, there are numerous ethical issues fraught with this new technology, with particular reference to the status of the human embryo and the ethical propriety of using human embryonic stem cells for research purposes. But within the African context, the controversy over stem cell research assumes a different dimension principally because of the cultural and religious framework of the African mindset. The cultural paradigm of Africa is a determinant of the African worldview and conservative outlook about modern scientific advancements. This greatly impedes the 'medical' growth of its people and subjects them to the peril of curable diseases.

The African culture greatly influences the decisions and affects the African perspective of events in a dynamic world characterized by innovations in diverse areas of human endeavour. The debate on stem cell assumes a new ontological status in contemporary African paradigm with respect to another medical technology, cloning. This is because of the proximity of stem cells and cloning. Stem cells are used for therapeutic cloning purposes, that is, in the treatment of diseases embryonic stem cells are used as cloned organs, tissues, cells e.t.c. While this is laudable, cloning is seen as an aberration in African medicine, an attempt to usurp the creator's duties and crossing of the border between the created (man) and the creator (God). Thus stem cell research has both religious and cultural implications for the African and this partly explains the reluctance of Africa to be part of a western-driven medical advancement and moreover stem cell research contends with the Afro-centric nature of the African cultural paradigm within the context of the African view of the human embryo, cloning etc. Moreover, this article will attempt to clarify the concept stem cell research, undertake an appraisal of the African embryology and deal with an evaluation of stem cell research within the African cultural paradigm.

Conceptual Clarification

Stem cells are mother cells that have the potential to become any type of cell in the body. They are cells with the ability to self-renew or multiply while maintaining the potential to develop into other types of cells (Gardner 2002, 279). Stem cells are undifferentiated biological cells that can differentiate into specialized cells and can divide (through mitosis) to produce more stem cells. Stem cells are found in multi-cellular organisms and possess several distinct characteristics. They form the foundation for every organ and tissue in the body and of varying forms. It should be known that every organ and tissue in our body grew out of a cluster of stem cells early in development. More so, stem cells can repair and replace tissue in the body (National Institute of Health). In other words; they possess the ability to heal. Stem cells start in the embryo as unprogrammed cells, then become specialized to create bone, muscle, skin and other types of specialized cells (National Institute of Health). Stem cells can be found throughout every stage

of human development – from embryo to adult but their potentiality decreases by age (McHugh 2004, 209). More so, they can be regarded as the foundation for every organ and tissue in the body.

Stem cells are classified into two: embryonic and adult (also called somatic) stem cells. According to the Belgian consultative committee on Bioethics, embryonic stem cells (ES cells) are cells deduced from the inner cell mass of the blastocyst, which will form the foetus. Those cells are pluripotent and can differentiate into all cell types of a human adult (Bioethics Advisory Committee 1999, 8). From the definition of embryonic stem cells, it can be deduced that they can be obtained directly from embryos or from the foetal germ line. For the sake of emphasis, blastocysts are precursors to embryo i.e., it is blastocysts that develop into embryos. About 5 to 6 days after fertilization, the blastocyst begins to form and it goes on to form the placenta, foetus and other associated tissues. It is from these blastocysts that embryonic stem cells which can generate any kind of cell in the body are derived. On the other hand, adult stem cells can be found in specific tissues in our bodies, they are mature cells specialized to perform certain functions in the body and can only make the kind of cells found in the tissue where they are found.

Unlike adult stem cells, embryonic stem cells are pluripotent that is, they can develop into any type of cells and are of acute relevance in health care. Embryonic stem cells are valuable because they provide a renewable resource for studying normal development and disease as well as testing of drugs and other therapies. They have become integral in regenerative medicine as they have been shown to have the potential to generate replacements for cells that are lost through injury and/or disease. This is not strange as they naturally serve as a form of internal repair system driving essentially without limit to replenish other cells as long as an individual lives. The value of embryonic stem cells was illustrated by Robertson who held that, if ES cells could be directed to differentiate into particular tissues and be immunologically altered to prevent rejection after engraftment, they could lead to the treatment or cure of the major lethal disease of this century: neurodegenerative disorders, cancer, heart and coronary disease (Robertson 1999, 110).

Adult stem cells maintain and repair the tissue in which they are found and can be found in children as well as adults. They have the ability for self-renewal but do not possess pluripotency but rather are multipotent but a major scientific breakthrough early this decade is the discovery of induced pluripotent stem cells (Mayo Clinic, 2013). These induced pluripotent stem cells are adult stem cells that have been induced (treated) to revert back to an embryonic like or pluripotent state (Winslow 2009, 41). This has enhanced the possibility of treating degenerative diseases using adult stem cells as well as eliminating problems with tissue rejection e.g. they can be used in transplantation medicine with the added advantage of enhancing tissue compatibility and immune tolerance, because donor and patient are one and the same person (Hansen and Schotsmans 2004, 316). Adult stem cells are also used in treating liver cirrhosis, limb ischemia, leukaemia and blood cancers through bone marrow transplants. But generally, stem cells gain use in the treatment of diseases such as Osteoarthritis, Parkinson's disease or Alzheimer's disease, organ failure, cancer etc.

Ethical Controversies in StemCell Research

As with other major medical breakthroughs of the 20th century, stem cell research is rife with many controversies, of which the source of embryos for research, the destruction of embryos in the course of embryonic stem cell research and the debate on when life begins ranks among the greatest. It is noteworthy that the controversies enshrine in stem cell research are peculiar to embryonic stem cells principally because they are obtained from embryos. Many of the debates surrounding human embryonic stem cells concern questions such as at what point does one consider life to begin? Is it just to destroy an embryo cell if it has the potential to cure many more people? Are human embryos means to an end? Are utilitarian considerations applied in embryonic stem cell researches just and fair?

The status of the human embryo and ES cell research is notably controversial because embryonic stem cell research requires the destruction of a human embryo; the destruction of human embryos occurs because the embryos must be destroyed before the stem cells contained in them can be extracted. On impulse, stem cell debates have motivated and reinvigorated the pro-life movement, whose members are concerned with the rights and status of the embryo. The pro-lifer argue that embryonic destruction (for embryonic stem cell extraction) violates the sanctity of life and is tantamount to murder (Connolly 2005). This argument is based on the claim that human life begins at conception, i.e. the moment a sperm cell fertilizes an egg cell. More so, opponents of embryonic stem cell research claim that these researches treat embryos as means to an end i.e. as sources for regenerative purposes while not putting the moral status of the embryos into consideration. They also argue along the potentiality stance that human embryos are potential human lives that deserve protection and respect similar to those enjoyed by actual humans.

The arguments against embryonic stem cell research finds place in the denouncement of the utilitarian principle employed for using human embryos for research purposes. The proponents of ES cell research argue on their part that embryos are not equivalent to human life while they are still incapable of surviving outside the womb and as a result only have the potential for life while also claiming that more than a third of zygotes do not implant after conception, rather are destroyed albeit naturally. Some contend that human life begins when the heart develops which is during the fifth week of pregnancy, or when the brain begins developing activity which has been detected at 54 days after conception (Singer 1996, 104). Moreover, they also argue embryonic stem cells have the potential to grow indefinitely in a laboratory environment and can differentiate into any kind of tissue, hence the best source of research into cellular therapies and regenerative medicine. Another argument that advocates of embryonic stem cell research hold onto is that many of the embryos used for embryonic research are unused embryos obtained from IVF and slated for destruction but using them for scientific research uses a source that would otherwise be wasted.

It can be seen that stem cell research do not pose an ethical challenge as embryonic stem cell research does but nonetheless, the ethical issues peculiar to embryonic stem cell research and stem cell research in general have far – reaching implications for the human embryo, scientists, political leaders and the public as a whole.

African Perception of the Human Embryo

African cosmogony is regarded as a transcendental continuum comprising the dead, the living and the unborn. These three entities make up the African hemisphere of life as it is believed in African ontology that the dead, the living and the unborn play important roles in the continuity of life hence beliefs such as immortality of the soul, reincarnation are special features of the African society. With regards to the unborn, African believe they are extremely valuable because of several reasons. One, they are potential beings with the ability to define or redefine the family or community into which they are born. Secondly, children are seen as the greatest indicator of a fulfilled life, wealth and other things. In Africa, a child is the most treasured object and constitutes the focal point of life (Tangwa 2007, 449). This explains the importance of children, even unborn ones.

The normative understanding of a human embryo in Africa falls within the gamut of a being with a right to life. This means that the African perspective of an embryo is akin to that of an actual being hence the Yoruba adage, “eyin lon d’akuko” meaning “an egg grows into a cock”. As a result, it is regarded that the embryo grows to become a person and as a result has a right to life for if the embryo were not, the resulting human won’t be. More so, the embryo is regarded as a gift from God the creator and giver of life and must not be tampered with to avoid the ire of God. This partly explains why abortion is abhorred in Africa. It is believed according to African perception that the embryo is a life and that life begins at conception. Consequently, the African view on the human embryo can be expressed as a syllogism:

It is wrong to destroy human life
A human embryo is a human life
Therefore, it is wrong to destroy human embryos

The African conception of the embryo is as a sacred gift of immense value with the capacity to become and unbecome in life. Because of the intrinsic value attached to embryos, it is morally repugnant to abort or even murder a pregnant woman (particularly, because of the life in her), little wonder pregnant women are treated with care the moment they are known to have conceived. This shows that despite the fact that the seed of conception is at an early stage, it has become an eagerly anticipated member of the family and community at large. Africans thus perceive the human embryo as an inestimable member of the society and are regarded as having human status.

Afro-Cultural Appraisal of Stem Cell Research

The African culture plays an important role in shaping the world-view of Africans with African culture and religion forming an interconnected network of beliefs that shapes and determines our understanding of events in the universe. Culture is generally regarded as the totality of a people’s way of life. Conversely, religion is an important force in the life of man and in the African civilization. According to Idowu, religion is an inescapable phenomenon for every man (Idowu 1973, 55). Due to the import of technological breakthroughs to African societies,

medical innovations and advancements are scrutinized ethically from a cultural standpoint, that is, the African culture forms the basis for doing an ethical evaluation of new medical technologies.

With regards to stem cell research (particularly embryonic stem cell research), there are ethical variations among scientists, ethicists and others but my appraisal of these issues will take a cultural dimension. Just as mentioned earlier, source of embryos for research purposes and destruction of embryos are some of the ethical issues that confront stem cell researchers but these issues are centralized around the moral status of the embryo. In African ontology, the embryo is a human life and is seen as an entity worth protecting, besides, any research that involves human experimentation is frowned at because the African culture sees every life as valuable and not a commodity. Thus the embryo is not regarded as a thing that should be handled anyhow, moreover it is not an entity for scientific manipulation but a life that has its place among humans. It belongs to a community of humans and not a laboratory.

In reference to the African religion and culture which regards re-incarnation as a means of having once-dead members of a family come again in the form of new baby, stem cell research poses numerous dangers. This is because since it is believed that it is embryos that eventually become babies; embryos are potential re-incarnated soul and if embryos are destroyed to extract stem cells then re-incarnate individuals' lives are destroyed as well. Thus embryonic stem cell research portends danger to the age-long cultural belief in re-incarnation. Another cultural antagonism lies in the source of embryonic stem cells. Culturally and religiously, every life is regarded as a gift from God and should not be tampered with and with human embryos regarded as capable of life, the question, where will embryonic stem cells be obtained readily comes to mind. The African paradigm is not at par with stem cell research because since embryos are the only source of embryonic stem cells and destroying them is regarded as murder in our cultural context, then stem cell research is not in tandem with African cultural norm and moral values. Another objection from the Afro-cultural standpoint is the alleged usurping of God's functions by mere mortals. This can be succinctly rephrased as the rejection of science's attempt to play God. At this point, it should be noted that stem cell research is akin to therapeutic cloning. Cloning does not fit into the fabrics of African religio-cultural framework and is regarded as an abominable attempt to take over God's responsibilities.

Stem cell is actually a biomedical technique intended to develop a healthy copy of a sick patient's tissue or organ for medical treatment (Aborishade 2014, 278). This is regarded as an artificial attempt and raises the fear of science's ability to clone humans. It is feared that over time through embryonic stem cells, cloning humans might become a reality hence the non-acceptance of stem cell research as a result of cultural considerations. Cloning is a detestable act within the ambits of African religion where God is regarded as the giver and taker of life, the one with exclusive right to create humans. In a nutshell African culture sees cloning as an affront to God. More so, traditional African religion attaches a unique, continuing moral and spiritual significance to individual persons (including embryos) who are regarded as creation of God and with a valuable ethical status (Aborishade 2014, 279). The consequence of this is that no human is available for laboratory use and experimentation.

From the foregoing, it can be seen that embryonic stem cell research is objectionable and has no place in Africa's cultural framework but in a dynamic world where things no longer exist as only black or white, there is need to re-consider prior ethico-cultural stance. Opponents of embryonic stem cells research claim that it is a utilitarian consideration which treats embryos as means to an end. I want to note that utilitarianism is a component of African religion and culture. This is one of the reasons why at certain times, specific number of persons are used for sacrifices in times past on behalf of other members of a society. This is the principle of utility at work where one person or group of persons die for others to live. Moreover the therapeutic use of stem cells is a factor worth considering in appraising it. As a potential source of organs and tissues for transplant surgeries, it can also be used to repair or replace damaged cells in the brain, lungs, heart etc. Its importance in regenerative medicine will serve to alleviate the pains and sufferings of Africans who can't afford expensive medical treatments like dialysis, chemotherapy etc. Stem cells will also serve as a viable source of organ availability thereby reducing waiting times for organ transplants, medical tourism and organ sale on the black market among other benefits.

This is not to say human embryos are worthless and of no value hence, are the best source of "materials for experimentation" but rather that they are of great importance. With improved technology, there is a possibility of extracting stem cells without destroying the embryos. Also, adult stem cells can now be induced and reverted to embryonic stem cells; this means that adult stem cells can now be converted into embryonic stem cells thus stemming the tide of controversy that surrounds the use of embryos for researches.

Conclusion

In view of the dynamism of biomedical science, African countries need to maximize the benefits of modern technological revolutions in health care while minimizing the various disadvantages and negative effects attached to these medical technologies. Moreover, Africa needs to forge a new cultural framework to enable it adapt to the sensitivities of the modern world if Africa is to have a place in the comity of nations. In other words, there is need for a paradigm shift in our cultural framework to accommodate the dynamics of medical technology.

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