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EDITORIAL

Biomedical Technologies, Eugenics and Human Cloning: Public Health Law and Legal Issues in Health Practice

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ABSTRACT

The fast emerging pace of biotechnology has crossed some boundaries of culture, belief, and ethics. Cloning is one current example where lots of debates are going on, as it has become difficult to find solutions to various issues regarding reproductive cloning. The health risks to human beings and loss of dignity remain the central debate. There may well be other logical and legal problems regarding reproductive cloning. Furthermore, scientists do not have enough information about the impact of cloning on mental and biological welfare of the clones. The eugenic concept could be used on animals for the beneficent of human being.

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INTRODUCTION

Research in biomedical sciences has generated a wealth of new discoveries that are improving our health, extending our life, and raising our standard of life. Recombinant DNA technology was developed in the 1970s; initially it had ability to describe the basis of genetic disease. Human Genomics was the first progress of this work.[1] There have been new emerging technologies in human life. Classical genetics and molecular genetics evolved in 20th century after the rediscovery of Mendel.[2,3] DNA manipulation was started in the form of plasmid inoculation for therapeutic purposes, augmenting of vectors, and generation of valuable DNA libraries. Furthermore, the individual colonies containing genes of interest were isolated and grown. Cloning was simply the derivation of culturing the individual colonies. It is the derivative of colony of interest where all the genes are alike in each sub derivatives. All these achievements were based on hybrid and sequencing technology.[4,5]

The application of knowledge gained from manipulation of genomes of many living organisms was aimed to improve the health care in a humanistic way. However, this new field created a series of highly complex scientific, economic and social issues.[6] Cloning techniques enabled the scientist to bypass or asexually produce desirable species.

The success of such genetic printing produced a vast commercial possibility like attracting numerous organizations and universities towards the cloning of animals and human stem cells.[7] The practical work was proved in the form of Dolly the Sheep in 1996 - 1997 by Ian Wilmot and his associates.[5] It was believed that information will be beneficial in terms of prevention, promotion, and diagnosis of communicable, non-communicable and genetic diseases. Despite many medical benefits of genomics research it had led to disparity in health care within and between the countries.[1] Following the successful work of Wilmot in 1997, international community became seriously worried about application of cloning techniques to human beings. Responding to such public terror, almost all countries rapidly stirred to prohibit human reproductive cloning, whether by official stamen or by law to some extent.[8] These concerns were addressed in a manner as to what should be allowed for the benefit of human beings. Most issues raised were in areas such as confidentiality, stigmatization, discrimination, regulating the genetic screening, gender issues and eugenics. The specific ethical issues are all colored by broader concerns about eugenics. The belief that genetic pool or inheritance of population will be improved had raised the racial and ethnic evils in the world. Latterly it was ended in the Nazi eugenic program whose first-time evils permanently brought into disrepute eugenics and mostly ended the eugenics movement.[9] This was a non-therapeutic use of genetic sciences to control the genetic inheritance of children labeled as Eugenics and was considered as unethical which was banned for all such use. Some authorities consider human reproductive cloning as non-therapeutic enhancement, but acceptable to some extent in certain circumstances.[10]

There are different arguments of people about therapeutic and non-therapeutic cloning. The therapeutic cloning is also called Biomedical cloning, which involves the process of somatic cell nucleus transferred/injected from one person to the body/ovum of other one.[11,12] The purpose of therapeutic cloning is to produce organs for transplant. It does not involve creating newborns. The first attempt of human embryonic stem cell culture was by using surplus embryos from in-vitro fertilization cycle in Singapore in 1994.[13]

Knowing the consequences there have been rush of different arguments all over the word. They felt that there should be rules and regulations, laws and acts which should be based on sound evidence so that human dignity could be preserved.[3]

Cloning: Cloning is the process by which genetically identical cells or organisms are derived through vegetative reproduction from single parents or a DNA population produced from a single hybrid molecule. The scientific meaning of clone is: genetically identical one or group of cells derived from a single cell/nucleus. Human cloning thus is the process of bringing into being of genetically identical humans.[14]

Recombinant DNA Technology: Recombinant technology involves the transfer of particular DNA fragment(s) from one individual to another recipient. Plasmid and cloning vectors are used in Human Genomic Project to make complementary DNA in order to generate sufficient identical materials. Cloning is one of the most well-known achievement of recombinant technology.[15,16]

Types of cloning: There two main types of cloning: Reproductive cloning and Therapeutic cloning, and these procedures are governed by different laws as they are used for different purposes.

Reproductive cloning: is the process where the nucleus from a somatic cell of one person (donor) is transferred to the egg (recipient) whose nucleus has been already removed. Once the embryo reaches to a suitable stage, it is transferred to the uterus of the female. This organism will be the exact duplication of the donor. Cloning of plants, animals, and humans falls into the class of Reproductive cloning. Dolly is the first known example of reproductive cloning.[17]

Therapeutic cloning: follows the same principles of genetics, used to produce embryonic stem cell for treatment purposes. It is also known as "embryo cloning".[18]

Human Cloning: Human cloning is referred to the formation of a genetically identical copy of an existing human or growing cloned tissue from that individual. It is an artificial technique through which human identical cell is produced apart from normal reproduction or parental mating. The clone baby is created which will be the exact copy of the person whose DNA has been implanted.[19]

Arguments against Cloning: There are diverse opinions about all issues related to cloning humans. This is perhaps why scientists are avoiding from either attempting or declaring it. Most of those issues contain strong religious and philosophic ideologies to oppose the practice of cloning. Moreover, the concept and ideology about cloning differ among different schools of thought.[14] However most of them come to the same conclusion that cloning is an act incompatible with human dignity and should not be practiced. The survey conducted in America by the Opinion Research Corporation on behalf of the Coalition for Advancement of Medical Research (CAMR) shows that majority of the population opposed cloning practice.[20]

Why People oppose Cloning: Arguments against reproductive cloning and 'therapeutic' cloning: One of the greatest arguments regarding the rapid advance evolution in biology, particularly in genomics and biotechnology, has been the technique of cloning. So long as cloning has concerned species other than humans, and is providing a useful service to mankind, it has been accepted, but when it has extended to the cloning of human being, it has triggered an international debate about both types of cloning.[21] There have been diverse opinions regarding human cloning; initially most of the countries and groups of people belonging to different schools of thought opposed the application of recombinant DNA technique in humans in one way or another. Those opposing had strong philosophical arguments and theology behind their perspective; some are discussed below.[15]

Religious Arguments: Approximately all religions initially had arguments for complete ban on human cloning. They said that human beings have right to be born in a normal way, not in a laboratory. They are saying that life is meant to come from God through a blessed relationship of a man and woman. They oppose embryo cloning because of fear of loss of human dignity. When the embryos are made artificially they can be frozen, poured down drains, treated as objects, which in turn encourage to demoralize human values and dignity.[22] The following are outlines of the Jewish, Christian and Islamic arguments regarding cloning which in turn enforced the government of their countries to formulate legislation regarding cloning.

Issues regarding Therapeutic and Stem cell Research: The issue of therapeutic cloning is different from that of reproductive cloning. Most scientists, and others groups from different schools of thought felt that research on therapeutic cloning to some extent should be allowed. There may be some conflicts and issues regarding therapeutic cloning which can be viewed from different angles of ethics, laws and legislation.[6]

Ethical and legal issues regarding Non therapeutic cloning: Cloning technology is still in its formative years and therefore unsafe to apply on humans being. It may diminish the identity of an individual which in turn has effects on the systems of society.

Cloning may lead to loss of value of the children in a family and then in society. While in case of therapeutic cloning there may be legislative and informative misuse of the tissues.

Legal Issues in Cloning: Human cloning led to a variety of augments among the public, which enforce the law-makers to establish some hard and fast rules and laws. The legal issues may take place in following ways:

- Abolish personal identity, create duplication
- Create conflicts in family formation and relationships
- Commercialization of stem cell and organs
- Override rules of family and society
- Cause immunodeficiency and so spread infection in the world
- Unethical practices.[15]

Legislation regarding Cloning

There are diverse and strongly philosophical opinions regarding non-therapeutic and therapeutic cloning. Most of them oppose non therapeutic cloning but accept therapeutic cloning. Some scholars compete that human cloning to produce a child could be morally justified under some circumstances but it must concur with strong regulatory systems to prevent abuse.[23] The debate was emphasized at international level to take action to control the unethical issues in cloning practices.[24]

Regulations of Reproductive Cloning

Reproductive Cloning of Human being have been condemned all over the world, so that no country allows it. The national legislation regulates and viewed the issue through following three bullet statements.

- Prohibit the creation of cloned embryo (by embryo splitting or by somatic cell nuclear transfer).
- Prohibit the implantation of a cloned embryo into a uterus.
- Without specifying the method, prohibit any attempt to artificially create a human being genetically identical to another human being (embryo or fetus) alive or dead.[3]

B. Regulations of Therapeutic Cloning

About 35 countries have formulated laws to ban or partially allow human cloning. Therapeutic cloning has been allowed in some countries under the provided guidelines or criteria. The situation and regulations varies from country to country and the regulations on Somatic Cell Nuclear Transfer (SCNT) for embryo creation are rarely mentioned in the legal text, but creation of such embryos is generally regulated under embryo research.[11] Currently, there exist three different positions on embryo research:

1. Generally prohibit research on embryos (with some specific exceptions) and/or creation of embryos for research purposes;
2. Permit research on supernumerary embryos produced by fertility treatment but prohibit creation of embryos for research purposes;
3. Permit creation of embryos for research purposes with strict conditions.[3]

Pakistan: In 1959, UN General Assembly held a plenary session about the Declaration on Human Cloning, by which Member States were called on to adopt all measures necessary to prohibit all forms of human cloning; Pakistan was among the abstaining group. In Pakistan, as yet there is no legislation passed but Muslim scholars argue that reproductive cloning should be banned while therapeutic cloning may be allowed with some strict criteria.[24]

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