Continuing Pharmacy Education

Bioethics

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ABSTRACT

Bioethics was originally proposed in the early 1970s to denote ‘the incorporation of biological knowledge and human values’. It is becoming more relevant in the biological age. This paper looks at some of the biological issues that require an ethical input. These include the Human Genome Project, human cloning and assisted reproductive technologies, contraception and abortion, organ donation and transplantation, euthanasia, brain death, human embryonic cells and AIDS. Examples of issues that have been raised in this area: Who owns our genes? Can we ‘design’ our babies? Should humans be cloned? Can pregnancy be terminated? Is mercy killing all right? Is brain death equivalent to death? Can embryonic cells be used in experiments? While some have been settled, others still persist till today. The numerous ethical questions pertaining to biology beg serious efforts on the part of ethical theorists to dig deep into their established principles. Similarly those working within applied ethics cannot operate effectively without referring to theoretical ethics. Hence thus far, many of the bioethical issues have been tackled. It is proposed that as a member of the health team, pharmacists too need to be well versed in issues pertaining to bioethics.

Keywords: *ethics, biotechnology, cloning, euthanasia, brain death*

INTRODUCTION

A new revolution in the making

The 20th century was an auspicious century indeed. It showcased numerous achievements in science and technology. This is especially true of research in the field of biology and its related discipline, biotechnology. It is not an exaggeration to state that so soon after the information revolution of the last few decades, the dawn of the 21st century marks the start of yet another revolution, the biological revolution.

Although advances in the various fields of biology

have thus far resulted in major achievements, they also pose an inventory of real and potential hazards, as well as create new ethical conundrums. According to Lemkow (1993), an American study on “Public Perceptions of Biotechnology” reveals that the public accepts science and technology in general (1). However, attitudes to biological research indicate certain ambivalence. Sixty-six percent felt that genetic engineering would improve life compared with 92 percent for solar energy and 51 percent for nuclear energy.

However, 42 percent of the respondents said that it was “morally wrong” to change the genetic makeup of human cells.

In a similar European study, the main ethical issues in science and technology centre on human genetics (1). Apprehension and anxiety were expressed about the manipulation of human genetic material even when diagnostic benefits could be demonstrated. While therapeutic and diagnostic applications found much support, there was concern about the use of genetic information, such as the social pressure to have an abortion in the face of negative prenatal diagnostic information, although this does not necessarily require genetic engineering techniques. Concern was also expressed about the requirement of genetic information at work in relation to the right to privacy.

A TIME/CNN telephone poll of 1,1015 adult Americans conducted in early 2001 on the issue of human cloning, found that 90 percent of respondents thought that human cloning is a bad idea (2). The reasons for opposing cloning are: religious belief (34 percent), interference of human distinctiveness and individuality (22 percent), fear of it being used to breed a superior race (22 percent) and that the technology is dangerous (14 percent). Further, 93 percent of respondents would not want to have themselves cloned if they had the chance to do it.

The aim of this article is to look at several contemporary biological issues that beg an ethical input and to consider bioethical principles thus far applied to cope with some of these issues.

Human Genome Project

The Human Genome Project is aimed at figuring out what protein each gene produces and for what purpose. This human encyclopaedia may be used to identify diseased genes and design methods to substitute them with healthy ones. Hopefully, this type of disease prevention envisaged by proponents of gene therapy will be able to deal with many debilitating disorders such as Alzheimer’s Disease, Parkinson’s Disease and Huntington’s Disease, problems that have been attributed to genetic malfunctions.

Other spin-offs from the Human Genome Project include the ability to predetermine the baby’s attributes, grow new tissues and organs for transplantations, slow aging body parts and

prepare more effective vaccines. However all these procedures are not about to happen soon. In fact, not only do several technical posers appear to be daunting, the moral implications of the project are equally mind-boggling. First and foremost is of course the question of ownership. Who owns our genes?

Thus, scientists have begun to patent whichever sections of the genome that they can lay their hands on (3). Patenting proponents insist on the need to have such protection to ensure returns on their investment. Naturally ethicists have different opinions. Were the early anatomists granted entitlements to the various bodily organs they discovered? Galen could have staked claims to some of our veins and arteries. Ibn Sina too should have been granted rights to certain parts of the brain.

The other question is whether the benefits of genetic science research like the Human Genome Project could be distributed to the world’s population in a just manner. While some researchers prefer the human genome data to be freely available, others want a premium be put for using it. Therefore those who have had no part in the venture at all will have to wait and see if they can afford to pay for the information on human genes, should they need it for research and development.

Similarly, on the application side of this type of research, since gene therapy involves a high cost, only the minority already well supplied with medical goods and services will be able to afford it. This will only widen the existing differentials in health status between different social classes, and further broaden the North-South divide in terms of accessibility to modern medical treatment.

Genetic engineering and eugenics

Genetic engineering may help doctors develop ways to correct or compensate for some genetic defects, perhaps even during conception. This will surely give rise to ethical questions. Although at this stage we are talking about preventing or protecting our children from genetic diseases, artificial improvement of other traits of the developing embryo would surely be sought not too long in the future. This opens a whole new possibility of designing babies. Many agree that genetic engineering must not be adopted as a means for changing the human genetic constitution, in what is called the improvement of

the human breed, or in genetically tampering with the human personality or interfering in human competence or individual responsibility.

Cloning, assisted reproductive technologies and surrogacy

In 1997, there was a focus on the success of an animal cloning procedure using matured, rather than the usual embryonic cells (4). As this experiment involved a large mammal, the possibility of cloning a human becomes real indeed. The greatest motivation of cloning experiments described above is in finding ways of providing infertile couples with the opportunity to secure an offspring. But is human cloning desirable? Should parents be allowed to clone a child they lost? Should they clone to have twins at different times? Should cloning be allowed to produce vital organs for use to help others?

The birth of the first 'test tube baby' in 1978 marked yet another milestone in the history of reproductive technologies. In vitro fertilization became well accepted as a relatively-risk-free technique and by 1990, there were more than 25,000 'test-tube babies' in the world. Related to artificial reproductive technologies are the issues of sperm banks and surrogate motherhood. There are men who are not able to produce viable sperms for fertilization to happen. The wife in this case, probably would need to request sperms from donors. In order to facilitate this procedure, sperm banks have been established as a resource centre to provide sperms on demand. Then there are women who are physiologically unable to conceive and nourish fetuses. Conception of embryos prepared in laboratories will have to be done in a third party's womb, thus the term surrogate motherhood. Surrogacy is considered a legal procedure in some developed countries. Artificial reproductive technologies, though implemented previously, still attract public attention as moral questions with regard to these procedures keep cropping up.

Contraception and abortion

These are two biological issues that simply refuse to go away. Contraception is vital for family planning. Various types of contraception are available, either natural or artificial, and ethical issues that are still being debated today pertain to the suitability and permissibility of these methods. Abortion in particular generates moral questions of enormous magnitude. At what stage of the embryo does life begin? Does it start with the very first

beat of the developing heart? And when this happens, how does one justify terminating the pregnancy?

Organ donation and transplantation

Numerous ethical questions have been raised regarding tissue and organ transplantation procedures. They include whether human beings have the right to give away a part of their body such as the kidney or a portion of their liver, whether it is all right to harvest body parts of a cadaver, and how available parts are assigned to those who are in need of them. Although these issues may appear to be rather straightforward in some of today's societies, there are still those who are unsure of how to deal with them.

Then there is always the question of xenotransplantation, or transplantation using parts from animals. There may well be a lot of reservations among certain communities around the world regarding the suitability and permissibility of this method. In any case, there are contemporary ethical issues regarding "offspring donor" where for reasons of genetic compatibility, a couple decides to conceive a second child in the hope that he or she would become a donor for the first child who is in need of certain bodily parts, for example, the bone marrow. And with the coming of therapeutic cloning and new procedures like organogenesis (where specific organs rather than a whole human may be grown from embryonic stem cells), tougher ethical issues are bound to crop up.

Euthanasia

Euthanasia or mercy killing may be active or passive. Active euthanasia means patients are deliberately killed, for example by injecting an overdose of sedatives. Active euthanasia is normally voluntary, where a patient with a rational frame of mind requests and is granted death. Passive euthanasia happens when a patient is deliberately allowed to die from whatever illness he is suffering from, by refusing to perform surgery, initiate heart resuscitation procedure, or administer medication. Passive euthanasia may be voluntary, when the patient consents to it, or non-voluntary, when he does not express the desire to die.

Euthanasia has always been a prime issue in the debate on the right to die. It, however, is legally permitted in at least one western nation, that is,

Holland. In 1973, the Royal Dutch Medical Association approved guidelines for physician-assisted suicide (PAS), a form of euthanasia. These guidelines are: euthanasia must be done by a physician; a second physician must concur with the decision; death must be requested by the patient while competent; the request must be free of doubt, well-documented and repeated; the request must not have been coerced; the patient's condition must be intolerable; and that, there must be no way to improve the patient's lot.

The American Medical Association takes a very different approach on PAS. Although active euthanasia is forbidden, passive euthanasia appears to be allowed. The practice of allowing patients to die by not treating them, endorsed by thinkers as early as Socrates, is an inescapable part of modern medicine. Today more than 80% of people die in hospitals, and advances in medical technology have made it possible to keep almost anyone alive indefinitely, even after they have no thought or feeling or hope of recovery. The maintenance of life by artificial means in such cases is deemed pointless, as the hospitals would quickly be filled with living corpses, leaving more deserving patients no beds. Thus, many would agree that it is ethically acceptable to cease treatment and let such patients die (5).

Brain death

The traditional criteria for determining death, until recently, was the permanent cessation of heart and lung function. When a person stopped breathing and the heart stopped beating for more than a few minutes, that person was declared dead. The loss of oxygen to the brain would almost instantly produce irreversible brain damage and loss of all cognitive function (6).

However, the introduction of new medical technology, and most importantly of respirators, has enabled modern medicine to continue artificially maintaining patients' heart and lung function. This can often save lives that previously would have been lost. Sometimes, it may even permit the patient to recover a normal level of function.

In other cases, however, heart and lung function can be restored or continued by these artificial means after brain function has been partially or completely destroyed, for example, from prolonged loss of oxygen or severe trauma of the brain. Such possibilities have forced a rethinking

of the traditional criteria for the determination of death. There is now an additional criterion for death, that is, the complete and irreversible loss of all brain function, or so-called brain death. The concept of 'brain death' was first proposed in 1959 by a team of French doctors. The criteria adopted for brain death were coma, cessation of breathing, the absence of brainstem and tendon reflexes, and the absence of electroencephalographic (EEG) waves. If these conditions persisted in the patient for more than 24 hours, then he or she would be pronounced dead, and the ventilator switched off, even though the heart might still be beating.

Further discussions led to the announcement at the 22nd World Medical Assembly in Sydney in 1968, which in a nutshell stated that death had occurred if there were no means of saving the patient, regardless of whether some of his organs were still functioning. In the same year, the 'Harvard criteria to determine death' was introduced. In addition to the original French criteria, the Harvard criteria stipulates that there must also be an absence of pupil and spinal reflexes, no movement of the patient for an hour, and that breathing should cease three minutes after switching off the ventilator (7).

Human embryonic cells

Most recently in several countries, scientists and policy-makers are revisiting the issue on the use of human stem cells and embryos for research. Stem cells have the capability of developing into any type of tissue, as well as growing into human beings. Thus, in the United States, current laws forbid the use of public funds to obtain stem cells from human embryos (8). In Germany, a human embryo is protected under the law from the fertilization to the implantation stage. Any research on or with human embryos is prohibited unless the embryo can be ascertained of an immediate and direct benefit to it (9). But efforts are underway to reverse this situation (10). For example, the American National Institute of Health (NIH) recently issued guidelines on funding of medical research that makes use of human embryos (11). Similarly the British government has allowed cloning of stem cells for scientific study of transplants. This study would help bolster the prospect of therapeutic cloning that could develop new treatments for diseases such as Alzheimer's Disease and Parkinson's Disease.

Acquired Immunodeficiency Syndrome (AIDS)

The human immunodeficiency virus (HIV) that

causes AIDS continues to be a major threat to the health of millions of people worldwide. Sadly though, there is little sign that the disease is abating. Today it has been established that apart from the sharing of infected needles and blood transfusion, indiscriminate sexual practices are the main modes of HIV transmission. In view of the gravity of the situation, whatever means that can help to wipe out the scourge are strongly recommended, regardless of whether they are of preventive, curative or palliative in nature.

Prevention must be the primary strategy adopted to minimize the risk of HIV transmission. However, in relation to the compulsory HIV antigen or antibody screening that has been proposed for members of the high-risk groups, many ethical issues have to be surmounted. Is it morally correct to simply focus on the high-risk HIV-carriers, such as drug addicts, prostitutes, transsexuals and convicts? In order to avoid transfusion of contaminated blood, should donors, rather than the blood *per se*, be tested for HIV antibody or antigen? Should compulsory screening be imposed on brides and bridegrooms to ensure that they are free from HIV, thus preventing them from passing on the virus to their potential spouses or later even to their offspring? These are no doubt difficult and challenging questions. They must be dealt with extreme care and heartfelt concern for the parties involved. When it comes to ethics, there is always the dilemma of choosing between the interests of the community and those of the individual.

Ethics

Let's turn now to the issue of ethics and how humans have developed a system to tackle it. Bertrand Russell elegantly describes ethics as "in origin the art of recommending to others the sacrifices required for cooperation with oneself". Ethics, or the study of morality, makes up one of the four main divisions of philosophy. Here it is further subdivided into categories of meta-ethics or theoretical ethics, that is the study of meanings of ethical terms and the forms of ethical argument; descriptive ethics, that deals with the study of moral and ethical beliefs and customs of different cultures; normative ethics, which is the study of ethical principles that have been accepted as norms or right behaviour; and applied ethics, that relates to the application of moral standards used in decision-making to concrete rather than abstract conditions (12).

The various ethical questions pertaining to

biological sciences in the contemporary world are clear indications that the time has come when ethical theorists can no longer ignore the problems of application. Similarly, those working within applied ethics can no longer operate effectively without taking theoretical considerations into account. This is especially true where principles and codes appear to make conflicting claims on the condition or situation under examination. When such conflicting claims occur it is referred to as an ethical dilemma. When this occurs, we will have to resort to ethical reasoning that is, the process of analysis in determining what is right or wrong, and what is the correct or more responsible choice in a given situation. It is also an examination of our moral judgements, and an attempt to determine the grounds on which these judgements are based.

The literature is filled with the various classifications of ethical theories. For example, they can be classified as, one, principle-based theories (normative ethics), and two, virtue-based theories (12). Principle-based theories are of either the deontological or consequentialist (utilitarianism) types. The former relates to the theory of obligation or duties, or rules and rights, while the latter links the rightness of an act to the goodness of the state of affairs it brings about. Judgements made may be general or specific. They are all normative, they affirm or apply norms or standards to making decisions. They must be universal, applicable to all relevant cases, impartial and objective. The procedure to implement principle-based ethical theory are, (i) identify ethical principles, and (ii) evaluate ethical choices in terms of how well they fit with those principles.

Virtue-based theories include communitarianism that applies the Aristotelian approach where practical wisdom is employed in the reasoning process, the focus is on the uniqueness of each ethical situation, and is based on shared community values. It also includes relationalism that emphasizes the values of love, family and friendship inherent to the situation at hand. The procedure to do this is by identifying the ethically virtuous person, and evaluating ethical choices in terms of how well they exemplify the deliberations of the ethically virtuous person. This theory is very much situation-based.

Bioethics

Bioethics can be defined as the study of the rightness and wrongness of acts performed within the life sciences, through the application of both

ethical theory and casuistry (case-study method) to the complexity of development in the biological sciences. The bioethics practiced today mostly derives its rulings from the normative and situational ethical principles. The word 'bioethics' was first coined by the oncologist Professor Van Rensselaer Potter II in 1970 in an article entitled "Bioethics: The Science of Survival" (13). After doing much work in the field of cancer research where he managed to establish links between certain types of cancer and environmental pollutants, Potter argued that a science of survival must be more than science alone. It should incorporate two ingredients, namely, biological knowledge and human values. Later, Potter (1975) refined the definition of bioethics as a product of cross-fertilization between the two branches, "medical bioethics" and "ecological bioethics" (14). However, medical practitioners did not generally accept these concepts. They preferred to redefine bioethics to mean clinical ethics.

And thus, from then on bioethics conjured a much narrower meaning than its original scope and breadth. And it is in this context that many of the recent and contemporary discussions on issues related to health, life and death are being looked at. This was particularly true during the era of heightened debates on reproductive sciences like contraception and abortion in the 1950s and 1960s. At the time, the founder-director of the Kennedy

Center of Ethics at Georgetown University, Professor André Hellegers seized the opportunity to turn bioethics into an academic discipline that reflected the needs of the time. This was rather easily acceptable as bioethics can readily be identified with the established field of medical ethics. In essence medical ethics began with the advent of medicine itself, that is, the 'Hippocrates Oath'. And then there was the anti-vivisectionist movement (15) that was already influential in the 19th century that helped to keep researchers who use animals as subjects for experiments, on their toes.

CONCLUSION

Today, bioethics is a full-fledged subject matter with a number of international professional societies, and courses offered in universities throughout the world. It will become even more important in the future. As a member of the professional healthcare team, pharmacists too need to be aware of the controversial issues pertaining to medical practice and how to deal with them. One way in which this can be done is to refer to long-established ethical guidelines. With this, pharmacists can play an important role in alleviating patients' and their relatives' anxiety, as well as clear their conscience on morally-challenging issues.

See page 8 for the CPE question

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