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Review Article

Physician facing ethical issues of biomedical experiments

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ABSTRACT

Introduction: Among numerous branches of science, advances in biomedical research are perceived to be the most controversial. This relates to biomedical experiments which involve human and animal trials. This article attempts to outline both historical and current dilemmas in the field of biomedical sciences. Today, scientists face new challenges with respect to humanitarian medicine.

Aim: The aim of this study was to discuss ethical and moral issues connected with experiments involving animals and human beings. The authors aimed at presenting directions of development for new branches of medicine.

Materials and methods: This study presents a review of contemporary medical literature and legal regulations concerning experiments on animals and human beings.

Discussion: The issue and definition of bioethics, its historical evolution, as well as specificity of medical sciences and psychiatrics are presented in the context of medical experiments. Informed consent is discussed: regarded not only as a legal necessity, but as an ethical duty that facilitates desired communication between the researcher and the individual on whom the experiment is to be conducted. Experimental control methods, current implementation of a new operative technique – fetal surgery – and legal regulations concerning the protection of animals used for experimental purposes have also been analyzed, as well as the interrelationships between medicine and the economy.

Conclusions: Experiments have always been a part of medical developments and it is unlikely that these would ever be abandoned. Over the years, not only the advancement of medical procedures, but also the efficacy of treatment has changed. Along with the developments in medicine, the approach to medical experimentation on humans and animals has changed as well. Currently, medical experimentation has entered a new age which may be termed

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“humanitarian,” “planned” or “aimed,” which are all connected with devising well-accepted standards and appropriate legal regulations.

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1. Introduction

Medicine, as the art of maintaining, restoring and saving human life, used to implement in its practice some methods regarded as unacceptable in other fields of science. As a branch of science, it sometimes bases its progress on suffering. Being a physician means constant decision making, and it mostly concerns difficult decisions. Many medical decisions in the past were grounded on ambiguous premises that would have not been acceptable if all ethical norms had been fulfilled.

This issue seems to be still valid when scientific progress is seen as burdened with experiments on animals, cloning and experiments on prisoners. How detailed should control mechanism be in order to prevent those individuals working for science and medical progress from being accused of acting against ethical norms? How should the Bioethical Commissions control and restrict matters concerning experiments on animals and humans, and how well-grounded should physicians' moral rules be in order to remain on the safe side when considering a thin, not well-defined border between saving a human being and destroying its existence in a chase for saving its shadow?

Ethics may be interpreted in three major ways: as a science about morality, as a synonym of morality, and as a particular ethical system.² Every ethical system defines norms as two differing categories: orders and prohibitions. When talking about ethics, we talk about what we should and should not do. We need to choose that which is placed in the in-between area. The main characteristic of ethical norms regarded as the elementary ones is their durability and longevity and independence from cultural and ethical systems. Dependent on the social and professional groups and cultural influences, particular norms may vary.^{2,6,7} Both in the past and at present times, physicians are subject to other, additional norms which do not refer to the rest of society. Thus, such professionals are in a particularly difficult situation: on the one hand, the requirements they are to fulfill are high and, on the other, temptations to break the rules are more prominent when compared to other professions. In a great majority of medical universities all over the world students have an opportunity to study medical deontology. However, it is not so important to learn the rules as to identify oneself with them, to master the ability to distinguish between good and evil, and to notice the border that exists between what is beneficial and harmful.

2. Aim

The aim of this work is to present the ethical and moral aspects of biomedical experiments on animals and humans.

3. Materials and methods

Authors performed a review of scientific papers and contemporary legal regulations concerning biomedical experiments.

4. Discussion

Being a physician entails new perspectives and possibilities – not available for any other professionals. On the one hand, it means acting between life and death and access to the most protected secrets of patients. On the other hand, working with patients who exhibit extreme behaviors when facing life-threatening diseases tends to contribute to the development of conformist and relative attitudes in the physician himself.

Combining being a physician with pure science is quite risky, especially when a dissociation of physician's and scientist's personalities occurs. A physician–scientist should always remember that “*primum non nocere*.”⁷ He should not forget that a patient is not only a source of such interesting factors as TNF- α , IL-10, etc. The combination of a physician who knows everything about a patient and a success-greedy scientist is a moral oxymoron. A physician–scientist should be a human in the first place, next a physician, and only finally a scientist. In other words, when there is a temptation to break ethical rules in the name of scientific development, he should consider a patient's interest primarily, before personal lust for glory and fame. Another problem is granting open access to individuals who are not physicians with respect to confidential, medical data. In such cases, non-physicians should also be subject to the medical data confidential policy.²

Currently, the physician–patient relationship is only one in a vast group of interactions that may be referred to as bioethics. Along with the progress in medicine and the development of its multidisciplinary character, medicine is no longer a field as pure as it used to be. It is more and more common that debates over ethical aspects of the aforementioned relationship are addressed also by biologists, psychologists, philosophers, theologians, politicians, lawyers, and other professionals. This interdisciplinary branch of science transcends medical ethics *sensu stricto*. Apart from speculations about problems concerning health and disease, medicine also addresses issues such as the ecosystem in which human beings live, the limits of a tolerable intervention in the life of an individual and society, or living individuals in general, as well as the acceptable degree of implementation of modern technologies in experiments on living organisms.^{2,7}

Both in the past and now, science has been practiced by people who have skills, knowledge and are labor intensive. In the past, scientists usually acted alone, as discoverers respected by others, or regarded as lonely half-insane warriors.

At present, science is no longer a privilege for a few, exceptional individuals. Today scientific research is conducted in a different manner. It is now a well-organized group practice, where the entire process – beginning with planning, continuing with conducting experiments, and ultimately concluded by processing results – is much less random compared to what it appeared to be some years ago. Today science is performed by large, multidisciplinary teams of specialists, which guarantees a broad perspective concerning analyzed problems. As long as experiments concern nonliving matter or do not interfere with the human population, ethical issues practically do not exist. However, when one enters the field of research or experimentation on animals and human beings, many questions of an ethical nature come to mind.

When considering the high participation of individuals who do not belong to the medical community in biomedical practice, whose involvement, due to its multidisciplinary nature is unavoidable, there is a threat of using patients' data, normally protected by medical confidentiality, in an ethically ambiguous way. It is necessary to remark that most of the personnel who have access to patients' confidential data have not been trained in a manner similar to that of physicians. It is not only connected with education in professional matters, but mostly as regarding ethics, the history of medicine and bioethics. It is not true that physicians constitute a different kind of people, gifted with special mentality, sensitivity or ethical principles. However, along with gaining clinical experience and working with patients, a physician's sensitivity, empathy, and attitude to the patient and his secrets change. As a result, when the temptation to use confidential data concerning the patient in order to gain economic benefits occurs, a physician's behavior will differ from that of a person who is not a medical professional. Therefore, access of the latter group to patients should be restricted as far as possible.²

Not always in the history of medicine were medical experiments conducted under the supervision of ethical authorities. It was also common to perform them with disrespect to moral and scientific rules. Although Aristotle and Hippocrates first defined bioethics,⁷ their fundamental rules were not always remembered. Early "experiments with experimenting" may be best described as "random" and "accidental." Medicine began to ground its progress on real scientific trials not earlier than in the 17th century. Initially researchers were the subjects of experiments themselves, as well as their families. Gradually, they were substituted by hospitalized patients whose rights were not respected or executed.² It is worth mentioning that in Poland the current Medical Profession Act does not allow researchers to perform experiments on prisoners.⁹ First experiments were conducted on small samples and no statistical methods were employed to evaluate the results. It was in the 20th century when larger groups of patients, mostly prisoners and incapacitated individuals, were used.² Apart from the story of Frankenstein, the most disastrous dissociation of ethics and science occurred during World War II. It was then that the Nazis conducted their "experiments" on concentration camps prisoners, including pregnant women.⁵ In this context, it is difficult to talk about the pursuit of fame – especially – concerning seeking the truth. After the traumatic experience of World

War II, the first attempts to codify experiments on humans were undertaken (the Nuremberg trials) and since then one might expect the beginning of an era of medical experiments to which ethical principles would be applied. The Court in Nuremberg during the physicians' trial in 1947, concerning permissible medical experiments, for the first time addressed issues such as the research subject's consent to the experiment, the range of acceptable risk, qualifications and capabilities of the research team and the necessity of the experiment interruption.²

The aspect of mental illnesses and the scientific investigations of such illnesses initiate many doubts. Many questions arise concerning the position of a psychiatrist-researcher towards the patient-research subject whose cognitive abilities are often severely limited. Questions relating to the manner and scope of consent and the acceptable range of the experiment are unavoidable.¹ The issues of introducing new medications and a conflict of interests rest in the field of medicine, due to the relative ease of abuse, and are particularly strongly marked. Treatment of the mentally ill is governed by the Hawaii Convention. General principles of bioethics and biomedical research are applied to medical experiments performed on such patients. In studies concerning groups of psychiatric patients we cannot veil our actions by claiming apparently correct actions, compliance with the law, or even the rules of the Code of Medical Ethics. The Medical Profession Act requires a physician to act in the best interest of the patient.¹¹ Although sometimes medical experiments create the illusion that medical actions are performed in the name of necessity, for the vague general goodness of society or even humanity, one cannot forget the basic imperative of helping and not hurting a patient. *Primum non nocere* may sound banal here, but sometimes trivial matters serve as catalysts for the greatest wisdom.

In Poland, the Medical Profession Act clearly differentiates between therapeutic experiment and research experiment. The former relates to "the introduction of new or partially tested diagnostic, therapeutic and prophylactic methods by a physician in order to achieve direct benefits for the patient. Therapeutic experiment may be conducted if previously implemented medical methods are not effective or if their effectiveness is not sufficient." The second type of experiment aims primarily at increasing medical knowledge. This type can be carried out with both ill and healthy individuals. Conducting research experimentation is acceptable only if participation in it does not entail risk, or if the risk is low and not disproportionate to any possible positive effects of such an experiment.⁹

Each medical procedure involves some risk. In everyday medical practice, physicians themselves sign and assist patients with signing consents for surgery. It is of great importance that such consent is not only limited to a patient's signature, identical on all forms. Under the provisions of the existing law on patient rights and Ombudsman for Patient Rights,¹⁰ the patient has the right to receive clear and reliable information concerning the best available treatment methods. Today, it is common to apply the so-called conscious consent to treatment (informed consent). Its contents should clearly specify that the patient has been informed about alternative treatments, possible

complications and side effects. Signing consent by the patient should attest to the fact that he thoroughly understood its contents. Moreover, the information contained in the consent form should be presented in a manner appropriate to the intellectual and cognitive abilities of the person who signs it.⁴

Informed consent not only ensures medical safety in case of complications, but most of all, when conducting medical research or a clinical phase of the experiment, it provides the basis for their implementation. The patient participating in medical research must be aware that if he refuses to give consent, the physician's attitude will not change and it will not affect the quality of diagnostic and therapeutic procedures. Taking into account the risk associated with conducting a medical experiment, the range of risk involved cannot exceed the expected benefits of the experimental results.⁹ Depending on the subjects participating in the experiment, the Medical Profession Act allows for different levels of risk.⁹

During the design of medical research, the principles of Good Clinical Practice must be considered. This document, in force since 1997 in the EU, USA and Japan, specifies methods which aim at ensuring the objectivity of the research, i.e., randomization and employment of placebo for the purpose of comparison with the double-blind study. Even the best designed and conducted studies may lead to a situation when the continuation of the experiment poses a threat to life or health of the patient. In this case, one should always remember that the ultimate aim is the interest of the patient and if this interest clashes with an ongoing study, the test should be stopped irrespective of its stage of advancement.²

To ensure the accuracy of the experiment and the maximum exclusion of external influences with respect to its effects, which result not only in ethical transparency of the results but also their usefulness, it is essential to eliminate any possibility of sources financing the experiment having impact on its course.

It is easy to undermine the objectivity of an experiment if key phases are funded by companies for which its outcomes would be significant. It is not uncommon that a company's interests affect the results of the study or experiment. This leads not only to complexities of a legal and ethical nature, but more importantly, it invalidates conclusions drawn from the development of a branch of medicine the experiment concerns.

In this respect it would be essential to introduce the concept of conflict of interests. One of its aspects relates to the so-called dual loyalties, i.e., a situation wherein the operator should meet the objectives that cannot be achieved simultaneously in a given situation.¹ The conflict of interests in medicine can be defined as "a situation in which financial or personal effects may impair or create the appearance of compromising the professional attitude to the course of the experiment and the ability to assess its performance."⁹

In an article concerning business ethics Lewicka-Strzańska states: "The lack of control over the conflict of interests may result in the domination of the public interest by private interests, but excessive control has a negative influence on the effective functioning of the companies and institutions."⁸ While the first statement seems to be valid not only in the world of business, but also in the field of medicine and medical experiment, the second cannot be extended to the

subject of our discussion. In medicine, in view of what has been previously presented, any conflict of interest that could affect the objectivity of the study should be not so much resolved as disclosed.

In her article, Lewicka cites the case of the death of an 18-year old patient undergoing gene therapy in the clinic at the University of Pennsylvania in 1999. She writes: "Researchers conducting the therapy had shares in the company that produced the appropriate preparation and hence was interested in testing it. Although it failed to demonstrate a causal link between the financial interests of the physicians and the patient's death, this case is indicated as an argument for standards requiring the separation of the role of the researcher and the participant concerned about experiment results." In this example, the conflict of interest resulted not only in the questionable scientific value of the research but, above all, the death of the person subjected to said experiment. The author of this article also refers to the problem of sponsored research concerning the effectiveness of drugs. The quoted studies relate to the impact of the relationship between experts and pharmaceutical manufactures on the objectivity of the study. This may result in not disclosing the negative results of certain drugs or in assigning properties to them which they do not have.

DeAngelis, based on the review of the results of many studies, claims that when a researcher has a financial interest in or has funding by a company related to the conducted research, the study is of a lower quality; there is a greater probability that the investigator will favor the sponsor's product and it is more likely that the results will not be published or that they will be published with a delay.³

Conflict of interest often arises through the establishment of personal relations between the representative of the pharmaceutical company and a medical doctor. The result of an attempt to influence the objectivity of the research depends only on the degree of a sense of moral imperative of impartiality presented by the physician.

Although this digression departs from the subject of medical experiment, I think that comparing experiments, in which not every physician is involved in their daily practice to the interaction with medical representatives of pharmaceutical companies for which we often work, helps to comprehend the nature of the problem and the mechanism of the conflict of interest in "great medicine" and the associated dangers.

5. Conclusions

1. In order to function properly, medicine needs constant development. Such development is inextricably bound to conducting studies and experiments.
2. Throughout history, medical experiments have not always been carried out in accordance with those rules that are today known as bioethics.
3. The traumatic experience of World War II, including the sphere of medical research, has led to the introduction of new quality measures with respect to conducting medical experiments.
4. The introduction of standards concerning experiments involving humans and the supervision of the Bioethics

Committee have resulted in less ethical concerns in contemporary medical research.

Conflict of interest

None declared.

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