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CHALLENGES FOR CONTEMPORARY MEDICINE AND RESPONSIBILITY FOR ITS DEVELOPMENT

Contemporary medicine, at the current stage of technological development, enables us to cope with many health risks. A new generation of diagnostics lets us discover diseases at an early stage of their development and also at an early life of a person, that is during the prenatal age. We try to prevent premature death and to increase the quality of life in situations when it is impossible to cure a person. That is why advancement in medicine should be perceived positively. However, technological development is always accompanied by something unknown, something that could not have been predicted because as there appear factors which make a given process get out of control. Of course, restrictions are imposed on such activities to make sure that what is possible is at the same time legally permitted. A worse situation arises when law cannot keep up with medical advances and what, on the one hand, is to protect life, on the other one becomes a threat to it.

Keywords: medical technology, prenatal diagnostics, transplantation, reproductive medicine.

Introduction

The purpose of this study is to draw attention to real problems associated with the use of new technologies in the field of medicine, followed by an attempt to answer the question to what extent, in the light of existing threats, this medicine can be described as human.

Methods

Two research methods were used in the work. The basic method is a critical analysis of the literature on the subject, which will allow to identify threats to human life and health in connection with the use of new medical technologies. To analyze the legal regulations in force in Poland, a dogmatic and legal method was also used, which will allow to determine the limits of the legality of medical interventions using new medical technologies.

Results and discussion

1. Legal and ethical aspects of human reproduction

Prenatal testing constitutes a clear confirmation of the intensive development of medical sciences, of the availability of modern equipment and highly specialised expertise of physicians of various specialisations. Contemporary practice of prenatal testing makes it possible not only to make a correct and detailed diagnosis but it also makes it possible to undertake treatment of the child during its intrauterine life or just after its birth. Together with the development of modern techniques of prenatal diagnostics, there appeared the opportunity to improve diagnostic and therapeutic skills and to raise the level of knowledge connected with genetic diseases (Łaczmańska, Łaczmański, 2009, 4, pp. 555-563; Liczbańska, Woźniak, Wawrocka and Krawczyński, 2006, 75 (5), pp. 486-490; Szczałupa, Obersztyn, Mazurczak, 2010, t. 3, p. 108). Together with the possibilities there appeared moral controversies, connected with the purpose of such tests, the risk connected with them, and the way in which the information obtained is used. Over the last twenty years, indications for prenatal testing have changed considerably, which on the one hand was the result of improved standards and, on the other one, the result of the possibility of medical intervention during intrauterine life (Debita, 2016, 10, pp. 313-324).

Women who decide to have prenatal testing mostly come from the genetic risk group – age over 35 when having the first baby, previous miscarriage, giving birth to a child with inborn defects, hereditary disorders. At the same time, a wider availability of prenatal testing results in an expanding catalogue of indications for it – unplanned pregnancy, lack of acceptance of the pregnancy, lack of support for the mother from her surroundings, the mother's strong fear for her own health and life and for the child, high need to control the situation. This tendency results from, on the one hand, the recommendation of scientific associations and, on the other one, from the very strong need to learn the child's health before it is born, both by parents and physicians (Debita, 2016, 10, pp. 313-324).

The main indicator for a moral assessment of prenatal diagnostics should be the mother's health and the best interest of the conceived child, including its dignity and right to live (Kapelańska-Pręgowska, 2011, pp. 347-352). It concerns both the issue of risk to the health of women and their children connected with invasive prenatal testing as well as the issue of decisions taken on the basis of the results of the test, of which the most morally controversial one is abortion based on the discovery of health defects in the child. Legal regulations in the area of prenatal diagnostics deal mostly with the subjective scope, in the meaning of access to tests and form the framework for abortion based on the discovery of congenital defects. These regulations also show what actions are not permitted. Therefore, it is not

possible to analyse prenatal testing only in view of the possibility of a therapy because a positive result of the tests sometimes gives the mother a legal right to abort the pregnancy (Szczycki, 2008, pp. 102-112).

Hence, at present it seems that an issue which is more important than the risk of complications is the issue of the purpose of prenatal testing. On the one hand, parents have the right to be fully informed about the developing baby, which also involves their child's diseases and the possibility of treating them in the prenatal period. On the other one, the physician is not only responsible for respecting the parents' rights, but also the rights of the child, including its basic right to live, which in circumstances which allow abortion on the grounds of genetic defects of the foetus creates a serious moral dilemma and a legal paradox. Further controversies are raised by the legal status of a conceived child during the prenatal period and the relationship of the parents' rights and the rights of the conceived child (Haberko, 2010, pp. 43-50; Banyk, 2014, nr 4, pp. 17-38).

Representatives of the medical and legal sciences do not doubt that at the current stage of scientific development, a foetus can be treated as a patient. However, its current legal status is not an independent object of medical activities, despite being an entity genetically separate from the mother's body. During the prenatal period, a child by itself cannot take any decisions concerning its own health. Similarly to the situation of a minor patient, the decisions are made by another subject, and in the current legal situation, it is the mother. It is a fact that action undertaken to rescue the life of the foetus will also involve the body of the woman, and at the same time in an opposite situation, that is when action is taken to improve the health of the woman – medical treatment provided to the mother will not be indifferent to the health of the foetus. It is a consequence of the biological dependence of the child on its mother due to its biological location in the womb. Lack of the foetus's independence in the biological sense should not determine the mother's sole decision-making capacity with respect to undergoing medical therapeutic procedures, when it is both parents who are interested in the child's health (Cascone, 2004, p. 165; Safian 2011, pp. 38-47; Haberko, 2010, pp. 82-90).

The inability to conceive a child is a social issue – both demographically and individually. From the medical perspective it is an issue of a complex aetiology (Wdowiak, Sadowska and Bakalczyk). According to the medical guidelines of international medical associations, and also in accordance with the current legal status in Poland, the procedure of in vitro fertilization can be considered only after a failure of previous treatment by other means or in a situation when the application of alternative therapies – in accordance with medical knowledge – does not yield positive prospects.

The Polish act on treating infertility permits freezing gametes and embryos, anonymous donation and reception of gametes and embryos as well as preimplantation diagnostics. It does not allow manifest donation of gametes or embryos, that is within the family or directed donation. There is a register of anonymous donors and recipients who use the material provided by them¹.

¹ The act of 25 June 2015 on infertility treatment (consolidated text.: Dz.U. 2020, item 442), and an implementing act: Regulation of the Minister of Health of October 23, 2015 on health requirements for a candidate for donor of reproductive cells for partner and non-partner donations, and for a recipient of reproductive cells and embryos and detailed conditions for the collection of reproductive cells for use in a medically assisted procreation procedure (Dz.U. 2015, item 1718, as amended).

An issue which raises controversies, both among patients and among specialists in reproductive medicine, is restricted access to infertility treatment to women without a partner. This sort of interpretation comes from the necessity to make unanimous declarations by the woman and the man concerning the recognition of fatherhood before they commence the therapy. Regardless of the assessment of this type of restrictions, in this context it seems problematic that there are no regulations that allow the medical procedure to be completed with the use of cryopreserved embryos by those patients who in the course of the treatment are left without a partner. Medically assisted procreation also requires an act to regulate in detail the limits of physician's interference in the nature of human procreation. The current legal status, especially with respect to defining the obligations of a gynaecologist-obstetrician who applies techniques of assisted procreation, is highly imperfect.

This problem also involves the issue of making decisions about the use of embryos which were created during the procedure of medically assisted procreation and later they remain in the place where they were created and in the current legal system it is not really clear what should be done with them. What is more, it is not possible, either, to determine their unquestionable legal status. As it seems, both the legislator, family courts and adoption centres face the problem of making decisions in a situation which a few years ago was not perceived as an adoption procedure.

On the other hand, the application of medically assisted procreation, in the light of the possibility of multiple selection based on preconception and preimplantation diagnostics and also on the techniques of modification already at an early stage of the development of the embryo, gives rise to moral problems. The methods of assisting reproduction give way to providing a child with specific features in accordance with the parents' will or plans. This shows that a human being is treated like an object, which can be 'built' according to one's own likes when it comes to appearance and health and this is not what medically assisted procreations is meant to do.

2. Psychological and legal aspects of transplantology

Transplantology is also the result of an advanced development of medical technology. Not only do they transplant fingers, limbs, hearts, kidneys, skin but also the face. The first case of a transplant of the male genitalia has been reported recently. In Poland, in comparison with other countries of the European Union, the number of transplants is not satisfactory, mostly due to an insufficient number of donors. Undoubtedly, the death of a close person is one of the most traumatic experiences for people. The definition of death, difficult to comprehend when it speaks of the death of the brain while the heart's activity is preserved, results in a situation when very often families of the deceased agree to the donation of their organs very unwillingly. Brain death is declared by a team of physicians which includes, among others, an anaesthesiologist, a neurosurgeon or a neurologist². Their decision does not always convince the family that death has occurred and the process cannot be turned back. Sometimes the family needs more time, which they do not have when it comes to donating organs, because in the case of people waiting for a transplant, time is at a premium.

² See: art. 43a clause 5 The act of December 5, 1996 on the professions of physician and dentist (consolidated text.: Dz.U. 2020, item 514, as amended).

Despite many social awareness campaigns we cannot achieve a high number of organ donors. One cannot be forced to be donor. We have no right to other people's organs. We do not have the obligation to save someone's life but we have the obligation not to cause death. Patients who die because of lack of organs do not die because of mean donors but they die of a disfunction of their organisms. Actions which benefit some people while seriously harming, especially resulting in the loss of life, another person are unacceptable. A voluntary donation of an organ or tissue (e.g. kidney, liver, bone marrow) to be transplanted to another person is acceptable unless it results in a serious impairment to the donor's health. A transplantologist together with their team which performs the transplant of the organ must be perfectly sure that the organ they are transplanting has been donated selflessly, excluding any premises that could be connected with any benefits (Monastyrska, Beck, 2014, 2, pp. 145-148). This is the basis of transplantology in civilized countries – selflessness is the foundation. The best legal, procedural solutions cannot replace the concept of selflessness and trust in transplantology, they can, however, systemize the whole procedure and provide the feeling of safety.

In the Polish legal system, if we pay someone to give us their organ, we commit the crime of organ trafficking, punishable by a term of imprisonment (Budyń-Kulik, 2017; Buczyński, Snopek, 2013, 49 (2), pp. 229-234; Złotek 2010, 1, pp. 5-42)³. It is widely known that there exists a black market of human organs. They can be bought in countries without sufficient state control and where there exists unofficial permission for this type of activity. Poor people are encouraged by intermediaries to donate their organs, most often the kidney, in return for a considerable payment. This phenomenon is described in literature as a form of a meeting of 'two desperate parties': poor people who want to get away from their situation and sick people who are materially well-off. Sick people fighting for their lives can risk everything they have. They become easy prey for professionals guided by low moral standards.

3. Telemedicine and e-health – benefits and threats

Tendencies on the market of medical services are aimed at close individualization in accordance with the patient's needs and with clear emphasis on innovative solutions, which results in the emergence of completely new branches of medicine and new possibilities of providing medical services. Technological innovation has influenced the development of teleinformation technology aimed at remotely assisting patient diagnostics, monitoring and rehabilitation. In this way there has appeared a new plane of cooperation with the patient without the need for a personal contact with the physician (Wiercińska).

Telemedicine means an exchange of medical information between at least two users by means of electronic communication in order to improve patients' health. Another way of explaining what telemedicine is refers to our life experiences. A remote access to a physician, providing diagnostics, preventive measures or remote rehabilitation – these are undoubtedly examples of telemedicine. Telemedicine means also tele-monitoring, tele-supervision, tele-nursing, tele-diagnostics, tele-prophylactics, tele-rehabilitation or, for example,

³ See: art. 43–44 The act of 1 July 2005 on the collection, storage and transplantation of cells, tissues and organs (consolidated text.: Dz.U. 2019, item 1405, as amended).

tele-description. A practical application of this information. For example people after heart incidents or with a heart insufficiency nowadays are very often provided by their physicians with small, mobile diagnostics devices. When their general feeling deteriorates, they perform a simple ECG test, it is later sent automatically to a physician, who interprets it and either contacts the patient and decides further procedure or even orders hospitalization. Thanks to mobile measuring devices, we can remotely send also our blood pressure results, level of glucose in the blood, oxygen saturation to a physician or we can even perform a simple ECG test ourselves. Then the results of our measurements can be consulted with a physician by means of videoconferencing (Kukuryk, Sadowski, 2017, pp. 153-164).

Another example is the extremely rapidly developing telepsychiatry. Sometimes it is easier to talk to a psychiatrist at home rather than take the rather 'stigmatizing' trip to their practice. Telepsychiatry, assisted by the opportunity to perform a remote test using clinical scales during the videocall is a very convenient means of contacts between a patient and their physician. Diabetologists also manage their patients by monitoring their blood glucose thanks to glucometers automatically sending test results (Malhorta, Chakrabarti, Shah, 2013, 55 (1), pp. 3-11).

Undoubtedly, telemedicine using modern information-communication tools connects patients' needs with technological development, crossing boundaries of traditional systems of health care. Apart from the concept of telemedicine, there appears the concept of e-health. E-health is understood more broadly than telemedicine and refers to all applications of information technology in health care. According to the definition by the World Health Organization, e-health is the common use of information and communication technologies (digital data is transferred, gathered and retrieved electronically) for clinical, educational and administrative purposes, both locally and remotely, in studies of public statistics, where e-health is an effective and safe use of information and communication technology to assist any activity connected with health care, including providing medical services, systems of observation of areas connected with medicine, health education, development of professional literature and knowledge as well as scientific research. We should note the patients' awareness, their knowledge of medicine and demands on the physicians and health care centres are often shaped by the electronic media, and first of all, by the omnipresent Internet. To satisfy a patient's demands, many Internet platforms have been created to provide information on health and illness and more and more medical centres, including primary health care facilities, nowadays offer the option of electronic patient services. E-health services can include on-line health services, such as e-registration, remote prescription of medicines, or e-prescribing, sending texts to remind patients of a coming date of an appointment or the necessity to take essential drugs (SMS reminders), electronically receiving test results or short orders from a physician (e-mail, texts), access to electronic health documentation (electronic health record – EHR), and also the more and more widely available telemedical services in the form of teleconsultation with a physician/nurse and telemonitoring basic health parameters of patients and their behaviour (eg. Tele-ECG, tele-spirometry, remote monitoring of blood pressure, blood glucose, temperature, body weight, fall detectors, movement sensors and others) (Bujnowska-Fedak, Tomczak, 2013, 11, pp. 302-317; Maciura, Lasek, Iwanicka-Maciura, 2014, 5, pp. 118-121; Kukuryk, Sadowski, 2017, pp. 153-

164; Teleopieka, telemedycyna ... 2007, 1, pp. 1-10; Siebiert, Rumiński, 2007, 1, pp. 1-10).

The economic and marketing context of health care and medicine brings the relationship between a physician and a patient down to a commercial undertaking, in which medical services are treated as a merchandise controlled by the mechanisms of market competition. Economic concepts of consumer, cost, profit, supply and demand are introduced into the traditional understanding of the relationship between a physician and a patient. The common sense approach suggests that a physician is interested in maximising profits and the patient – in limiting expenses on medical services and maintaining a good health. The relationship between a physician and a patient changes into the relationship between a patient and a service provider. A patient assumes the role of a consumer of health services or ‘manager’ of their own health, they are treated as a client purchasing a medical service. The current state of knowledge on this issue confirms that general access to medical information is not the same as gaining the competence of self-treatment and, above all, it will not eliminate the professional skills of a physician. The importance of physicians as health experts will increase in connection with the use of new means of communication with a patient. On-line consultations, also known as e-visits, can in the case of some medical services, replace real contacts.

The risks of telemedicine in the physician-patient relationship are: 1) internet information can be treated by patients as sufficient to make diagnosis and to conduct treatment themselves; 2) electronic and digital collection of patient data requires a system securing access to the information, which cannot ensure absolute safety. However, the main unwelcome effect of the development of telemedicine is a change in the mentality of physicians and of the relations between a physician and a patient, lack of a ‘holistic’ view of the patient and abandoning reflexion when evaluating and solving medical problems.

One of the major achievements in medicine is pharmacology, hence an important ingredient of the relationship between a physician and a patient is also the pharmaceutical industry and marketing. Manufacturers of medications want to have profits and to increase the sale of their medications, to achieve which they also engage physicians, by sponsoring them in many, often ethically doubtful, ways (Makowska).

All the above-given problems intensify when the physician-patient relationship concerns clinical tests performed for the purpose of the registration of medical products, medical experiments and other scientific research. Physicians participate in many research and marketing projects, whose results are not always predictable for the patients. There may be legal and bioethical securities concerning participation in experimental research, but by signing their conscious consent form to participate in a clinical trial, patients cannot fully anticipate the threat and assess the risk involved (Jasudowicz, Czepek, Kapelańska-Pręgowska, 2014; Safjan, 2011).

Literature and court decisions show that together with medical development, with the development of new treatment technologies and the perfection of diagnostic methods and therapies, the number of court trials concerning impairment to health caused by a medical error also rises (Jasudowicz and others, 2014; Safjan, 2011; Nesterowicz, 2014; Fiutak, 2012; Nesterowicz, 2013). It turns out that new technology, without which we cannot imagine effective diagnostics and treatment, is disastrous in many cases as it allows a physi-

cian not to think. For example, an interview with a patient, which is the primary elements of an examination, is often limited to a few questions, because other information is obtained by using, for example, modern radiological equipment or by performing laboratory tests. An interview with a patient ceases to be important. Of course, this is not the correct procedure, and negligence when collecting information during an interview is a premise of criminal liability in case of an impairment to a patient's health (Judgment of the Supreme Court of April 1, 2008., IV KK 381/07, LEX No. 404571; Sadowska, 2018, XIII, pp. 271-290).

Thus, it is reasonable to combine medical technology advances with personalised medicine and at the same time not to lose the human subject in it. The last few dozens of years brought about a large number of various types of orders, recommendations and guidelines for behaviour in such a way that as many people as possible are treated in the best possible way. This is a value that cannot be overestimated. It all comes down to a competent group of professionals looking though all knowledge available to them on a given subject, they evaluate it critically and give us the data in the form more or less specific recommendations. These recommendations should be made popular and, first of all, applied (Sadowska, 2019, p. 284; Lis, 2017, pp. 19-29; Lis, 2017, pp. 5-24).

In reality, a responsible performance of the medical profession requires much more than just knowledge, more than the skills required to operate modern equipment, more than particular manual skills. Creative thinking is an art, combined with the ability to anticipate, which should be used by physicians and other people working with patients.

4. Conclusions

The progress of human knowledge manifested in the development of new technologies has also not bypassed the area of importance for every human being, namely medicine. Medical devices and technological solutions, although they are essentially intended to serve a human being and protect him against loss of life and health, they can often be used against him, and consequently threaten human dignity. Undoubtedly, technological progress is most visible in the field of prenatal medicine, which on the one hand is optimistic that it is possible to save the lives of the youngest human beings, but on the other, the extent of medical interventions associated with the beginning of human life is a serious threat to human dignity.

Contemporary medicine, at the current stage of technological development, enables us to cope with many health risks. A new generation of diagnostics lets us discover diseases at an early stage of their development and also at an early life of a person, that is during the prenatal age. That is why advancement in medicine should be perceived positively. However, technological development is always accompanied by something unknown, something that could not have been predicted because as there appear factors which make a given process get out of control. Of course, restrictions are imposed on such activities to make sure that what is possible is at the same time legally permitted. A worse situation arises when law cannot keep up with medical advances and what, on the one hand, is to protect life, on the other one becomes a threat to it. Thus, it is reasonable to combine medical technology advances with personalised medicine and at the same time not to lose the human

subject in it. In reality, a responsible performance of the medical profession requires much more than just knowledge, more than the skills required to operate modern equipment, more than particular manual skills. Creative thinking is an art, combined with the ability to anticipate, which should be used by physicians and other people working with patients.

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Մոնիկա Սաղոմյան

*Վարչակազմի ինժեներիայի և առողջության համալսարանի
Բժշկական գիտությունների ֆակուլտետի դոցենտ,
բժշկական և փիլիսոփայական գիտությունների թեկնածու*

**ԺԱՄԱՆԱԿԱԿԻՑ ԲԺՇԿՈՒԹՅԱՆ ՄԱՐՏԱՀՐԱՎԵՐՆԵՐԸ ԵՎ
ՊԱՏԱՍԽԱՆԱՏՎՈՒԹՅՈՒՆԸ ԴՐԱ ԶԱՐԳԱՑՄԱՆ ՀԱՄԱՐ**

Ժամանակակից բժշկությունը տեխնոլոգիական զարգացման ներկա փուլում հնարավորություն է տալիս հաղթահարել առողջության բազմաթիվ ռիսկեր: Այստորոշման նոր սերունդը թույլ է տալիս հայտնաբերել հիվանդություններ ինչպես դրանց զարգացման վաղ փուլում, այնպես էլ մարդու վաղ, այսինքն՝ նախածննդյան շրջանում: Մենք փորձում ենք կանխել վաղաժամ մահը և բարձրացնել կյանքի որակը այն իրավիճակներում, երբ անհնար է մարդուն բուժել: Ահա թե ինչու բժշկության ոլորտում առաջընթացը պետք է դրականորեն ընկալվի: Այնուամենայնիվ, տեխնոլոգիական զարգացումը միշտ ուղեկցվում է անհայտ ինչ-որ բանով, ինչը չի կարելի կանխատեսել, քանի որ առկա են գործոններ, որոնք հնարավորություն են տալիս տվյալ գործընթացին դուրս գալ վերահսկողությունից: Իհարկե, նման գործողությունների վրա դրվում են սահմանափակումներ՝ հանդգցելու, որ այն, ինչ հնարավոր է, միևնույն ժամանակ թույլատրված է օրենքով: Իրավիճակը վատթարանում է, երբ օրենքը չի կարողանում զարգանալ բժշկական առաջընթացին համահունչ, և այն, ինչը մի կողմից պաշտպանում է կյանքը, մյուս կողմից դառնում է դրա սպառնալիքը:

Հիմնաբառեր. բժշկական տեխնոլոգիա, նախածննդյան այստորոշում, փոխպատվաստում, վերարտադրողական բժշկություն:

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ПРОБЛЕМЫ СОВРЕМЕННОЙ МЕДИЦИНЫ И ОТВЕТСТВЕННОСТЬ ЗА ЕЕ РАЗВИТИЕ

Современная медицина на современном этапе технологического развития позволяет нам справляться со многими рисками для здоровья. Диагностика нового поколения позволяет нам выявлять заболевания на ранней стадии их развития, а также на ранних этапах жизни человека, то есть в дородовой период. Мы стараемся предотвратить преждевременную смерть и повысить качество жизни в случаях, когда невозможно вылечить человека. Вот почему прогресс в медицине следует воспринимать позитивно. Тем не менее технологическое развитие всегда сопровождается чем-то неизвестным, чем-то, что нельзя было предсказать, поскольку появляются факторы, которые выводят данный процесс из-под контроля. Разумеется, на такие виды деятельности накладываются ограничения, чтобы гарантировать то, что возможно и что в то же время разрешено законом. Ситуация ухудшается тогда, когда закон не может идти в ногу с медицинскими достижениями и то, что, с одной стороны, защищает жизнь, с другой, становится ее угрозой.

Ключевые слова: медицинские технологии, пренатальная диагностика, трансплантация, репродуктивная медицина. технологии, пренатальная диагностика, трансплантация, репродуктивная медицина.

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