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The History of the Infertility Treatments in Medicine and Church Teaching

The Bible tells the story of Sarah and Abraham and their joy when, after many years of childlessness and despite Sarah's great age, she gave birth to a son, Isaac. God has given me cause to laugh, she said, and all who hear about this will laugh with me (Gen. 21:6). Today too there are many people who suffer because they cannot have children and who would be immensely grateful for a remedy. Modern medicine makes it possible to treat many types of infertility which could not have been treated in the past. Such progress in medicine is welcome, but only provided that the employed techniques respect human rights and do not infringe human dignity.

Key words: infertility, medicine, Church, treatment, diagnosis.

The Bible tells the story of Sarah and Abraham and their joy when, after many years of childlessness and despite Sarah's great age, she gave birth to a son, Isaac. God has given me cause to laugh, she said, and all who hear about this will laugh with me (Gen. 21:6). St Luke's Gospel tells of another mother, Elizabeth, who was overjoyed to find herself pregnant after many years of longing for a child. Today too there are many people who suffer because they cannot have children and who would be immensely grateful for a remedy. Modern medicine makes it possible to treat many types of infertility which could not have been treated in the past. Such progress in medicine is welcome, but only provided that the employed techniques respect human rights and do not infringe human dignity.

Infertility is defined as inability to have offspring in a natural way after one year of attempts. In modern terms infertility is not a disease but a symptom or a disorder preventing natural conception. Around

10-20% of married couples are unable to find the cause, in other couples the reason for it is the male factor (around 40%) or the female factor (around 30%) or there is a coexistence of conditions in both spouses (around 30%). The complex pathogenesis of infertility takes into account the hormonal factors, mechanic factors, immunological factors or genetic ones[1].

In 1987 the Sacred Congregation for the Doctrine of the Faith issued a document known as *Donum Vitae* ("The Gift of Life"), which addressed the morality of many modern fertility procedures. The document did not judge the use of technology to overcome infertility as wrong in itself. It concluded that some methods are moral, while others-because they do harm to the dignity of the human person and to the institution of marriage-are immoral. *Donum Vitae* reaffirmed an obligation to protect all human life when married couples use various technologies to conceive children. Without questioning the motives of those using these techniques, *Donum Vitae* pointed out that people can do harm to themselves and to others even as they try to do what is good, that is, overcome infertility. The fundamental principle which the Church used to assess the morality of various means of overcoming infertility was a rather simple one, even if its application is sometimes difficult.

Infertility

Epidemiological data indicate that infertility affects 14% of couples in the USA, 18,4% in France and 16,8% in Great Britain. In Poland such epidemiological research is not conducted but it is estimated that 18-20% of married couples have a problem with conceiving a child. However the third world countries are struggling with the phenomenon of secondary infertility, the causes of which are sexually transmitted diseases and surgical procedures carried out on postnatal women in conditions devoid of sanitary and epidemiological standards. Moreover, the access to professional medical assistance is limited by the economical factor[2]. Globally, the problem concerns 50-80 million infertile people. This phenomenon is developing further.

Each year the number of infertile couples is increasing by around 2 million. According to WHO such rate classifies infertility as a social

[1] Cf. B. Męczekalski, A. Warenik-Szymankiewicz, *Rola komórki jajowej w genetycznych uwarunkowaniach płodności i niepłodności*, "Endokrynologia Polska" 56 (2005), 3, pp. 356-58.

[2] Cf. A. Drosdzol et al., *Standard postępowania diagnostycznego w niepłodności*, "Annales Academiae Medicae Silesiensis" 60/5 (2006), p. 434.

disease[3]. Infertility has been added to the International Classification of Diseases and divided into male infertility with causal extensions under numbers N 46.0 as infertility resulting from azoospermia; N 46.1 as infertility resulting from oligospermia; N 46.8 as infertility of other origins; N 46.9 as undefined male infertility and the female one with causal extensions under numbers N 97.0 as infertility associated with lack of ovulation; N 97.1 as infertility of fallopian tube origin; N 97.2 as infertility of uterus origin; N 97.3 as infertility of cervix origin; N 97.4 as infertility associated with male factors; N 97.8 as infertility of a different origin; N 97.9 as undefined female infertility[4].

The most important factor determining fertility is age. Its peak period falls between 20 and 25 years old after which it declines. A sharp decline is noticed after the age of 35 and after the age of 45 fertility declines to a point where the probability of conceiving a child is negligible. Other factors include social conditions, economic conditions and religious influences. An element that cannot be forgotten is lifestyle and the use of substances: alcohol, smoking, drugs and the excessive consumption of medicines.

The environment in which potential parents live also plays an important role. Heavy metal pollution of the environment, pesticides, ionising radiation all have an impact on the infertility phenomenon. Concomitant diseases mainly involving genital infections, most commonly caused by bacteria "Chlamydia trachomatis" and "Neisseria gonorrhoeae" together with other anaerobic bacteria contribute to infertility. The resulting infections in the woman's body cause post-inflammatory obstruction of the fallopian tubes and intrauterine adhesions, while in men – the obstruction of the seminal ducts and deterioration of semen quality. Decreased fertility is significantly affected by thyroid disease, diabetes, immunological diseases[5]. Anatomical causes of infertility include abnormalities of the fertile organs: absence of vagina or uterus, double uterus with or without a double vagina,

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[3] Cf. T. Opala et al., *Epidemiologia i metody diagnostyczne*, in: *Ginekologia. Podręcznik dla położnych, pielęgniarek i fizjoterapeutów*, ed. T. Opala, Warszawa 2006, p. 133.

[4] Cf. J. Smyczyńska, *Diagnostyka i leczenie zaburzeń hormonalnych jako wyraz troski o zdrowie prokreacyjne i profilaktyka niepłodności. Czy metody rozpoznawania płodności mogą być pomocne?*, "Fides et Ratio" 39/3 (2019), p. 45; Cf. B. Graham, *Buck's 2020 ICD-10-CM for Hospital Edition*, Riverport Lane 2020, pp. 1107-1108, 1116.

[5] Cf. T. Opala et al., *Epidemiologia i metody diagnostyczne*, pp. 133-134.

partially or completely partitioned uterus, bicornuate uterus, cervical agenesis, vaginal agenesis, partially or completely partitioned vagina[6].

Doctors are increasingly mindful that infertility is determined by several factors, e.g. obstructed fallopian tubes may coexist with non-ovulatory cycles. Therefore, lack of ovulation cannot be treated without checking the patency of the fallopian tubes. Intensive development of immunology is viewed with hope as it may contribute to the identification of hitherto unknown aetiological factors of infertility. Knowledge allows for analysis and then for practical action regarding the normal structure of the body and its functions, the origin of diseases and their causes, the recognition of diseases and their treatment, the maintenance of health conditions, overcoming the effects of diseases[7]. The combination of knowledge, experience and principles of good medical practice with the achievements of modern science is contributing to the enormous progress in the diagnosis and treatment of infertility.

The history of procreative medicine

The development of knowledge about human fertility was very slow until a certain period. Fertility diagnosis was already carried out in ancient Egypt, India and Israel, but little is known about what methods were used. Mankind has always sought to extend the bloodline, with many motives for its actions. Jews strove to have as many offspring as possible in order to be victorious in the wars they waged. Every offspring was treated as a sign of fertility and a blessing from God. According to the knowledge possessed by the Israelites, a woman was in the best fertility period between the 12th and 15th day of her cycle. At the time, science had no evidence to support this information, and human intuition was the determining factor. In modern times, when medically developed fertility rates are available, it is awe-inspiring to see the awareness of the Jews of the time on this matter[8].

In ancient India, the procreative method used to select the sex of the child in order to recommend intercourse on even nights for the conception of a boy and on odd nights for the conception of a girl. Ancient Greece and ancient Rome do not have any remarkable medical and paramedical findings regarding the field of fertility. Soranuses of Ephesus observations played a crucial role in fields of women's diseases and obstetrics during the middle ages, he described the

6 Cf. A. Drosdzol et al., *Standard postępowania diagnostycznego*, p. 435.

7 Cf. A. Nawrocka, *Etos w zawodach medycznych*, Kraków 2008, p. 23.

8 Cf. U. Dudziak, *Życie, rodzina, wychowanie*, Warszawa 2009, pp. 55-56.

instrumentation for obstetric procedures, the birthing chair, the basic principles of neonatal nursing and he had knowledge of the anatomy of the reproductive organs, physiology and pathology of pregnancy and childbirth. His views formed the basis for teaching about women's diseases, obstetrics, anatomy of the reproductive organs in medieval universities[9]. In 1513, the first book devoted entirely to obstetrics was published, the field of obstetrics was separated from surgery. The author of the *Der schwangeren Frauen und Hebammen Rosengarten* book was Eucharius Rösslin (1470-1526). Medical advances in the theoretical sciences have not been without impact on clinical medicine. The number of schools, institutes, laboratories has increased rapidly; gynaecology (gr. *gyne*, *gynajkos* – woman), which is the branch of medicine dealing with the process of conception, the course of pregnancy and birth, has developed. In the second half of the 19th century, its development was contributed to by the Freiburg professor Alfred Hegar (1830-1914), who identified the softening of the uterine neck at the junction of the uterus with the body as symptoms of pregnancy. In addition, he contributed to the development of instruments used in gynaecology and obstetrics[10].

In the 17th century, the Dutch anatomist Regnier de Graff (1641-1674) discovered follicles in the ovaries of mammals, known to this day as *Graff's follicles*. Graff surmised that the follicle hides the embryo of the future embryo, which develops exclusively from the materials of the egg. The sperm was only supposed to stimulate the egg to develop. Opponents of his "spermisti" theory argued that it was the sperm that was the main force responsible for the formation of the embryo. An even more surprising theory was propounded by the 'preformists' represented by the Dutch physician Jan Swammerdam (1637-1680), who argued that if an embryo is preformed, then one generation must be stuck in the other, like boxes of increasingly smaller size. This theory held that the embryos of all generations living on earth must have fit into the ovary of the pre-mother Eve. Attempts have been made to undertake the counting of these condensed "little men" in Eve's ovary, arriving at a figure of 200 million. The Polish scientist Jędrzej Śniadecki (1768-1838) argued against this theory, stating that no life is formed in the fertilised egg. This idea was also promoted by the anatomy and physiology professor Friedrich Kasper Wolff (1733-1794), who formulated the theory of epigenesis, according to which

[9] Cf. T. Brzeziński et al., *Historia medycyny*, Warszawa 2014, p. 149.

[10] Cf. Z. Domasławski, *Wprowadzenie do medycyny. Podręcznik dla wyższych szkół zawodowych*, Jelenia Góra 2007, p. 56.

embryonic development begins with an amorphous unorganised mass in which currents of an undefined substance circulate, leading to the formation of various structures. This gives rise to organs that were never before present in either the sperm or the egg[11].

The well-known Italian physician Francis Scardona (1718-1800), dealing with women's diseases, claimed that female infertility was caused by witchcraft. The Dutch merchant Antonie van Leeuwenhoek (1632-1723), who was interested in glass grinding, constructing microscopes and making observations using them, isolated sperm cells from the observed material for the first time[12]. And in 1776, Italian biologist Lazzaro Spallanzani (1729-1799) noted that cooling sperm reduces sperm motility. In animal studies, he proved that male and female gametes are necessary in order for a woman to give birth to a new individual. While experimenting on them, he was the first to perform artificial insemination in frogs and dogs[13]. In 1826, the Russian biologist of German origin Karl Ernst von Baer (1792-1876) discovered the egg cell and a year later described the process of fertilisation[14].

After many years of development of gynaecology and obstetrics, procreative medicine is opening up newer and newer areas that need to be worked on. One such field is infertility. In the twentieth century, there has been a growing awareness of the diseases that accompany it. The causes of infertility are being attributed to incorrect diet or hormonal imbalances.

In 1901, Alfred Fröhlich (1871-1953), professor of pharmacology in Vienna, linked Adiposogenital dystrophy to pituitary dysfunction with which he paved the way for the search for causes of infertility in abnormal functioning of the endocrine glands. In 1905, English physiologist Ernest Starling (1866-1927) called the compounds produced by the endocrine glands hormones. In 1906, British gynaecologist and founder of the College for Obstetricians and Gynaecologists William Blair-Bell (1871-1936), together with Henry Dale discovered hormones in the posterior lobe of the pituitary gland that cause uterine contractions. In 1910, following the compilation of data by the Viennese physiologist and endocrinologist Arthur Biedl (1869-1933), the first monograph on endocrinology was published, in which the scientist

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11 Cf. B. Seyda, *Dzieje medycyny w zarysie*, Warszawa 1977[3], pp. 224-226.

12 Cf. *Antoni van Leeuwenhoek*, https://pl.wikipedia.org/wiki/Antoni_van_Leeuwenhoek (date of access: 24.02.2024).

13 Por. M. Bizdan, *Niepłodność w ujęciu bio-psycho-społecznym*, Kraków 2006, p. 161.

14 Cf. Z. Brzeziński, *Historia medycyny*, p. 149.

described the role of the pituitary gland in the secretion of hormones. The Parisian gynaecologist Selmar Ascheim (1878-1965) and the Berlin gynaecologist Bernard Zondek (1891-1966), achieved precocious sexual maturation in young mice in 1926, they used vaccination from the anterior pituitary lobe, and a year later in the urine of pregnant women they discovered *prolan A*, which stimulates the maturation of *graff follicles*, and *prolan B*, which influences the transformation of a ruptured *graff follicle* into a *corpus luteum*. This discovery led to the introduction of the pregnancy test in 1928. German biochemist Adolf Friedrich Johann Butenandt (1903-1995) isolated and determined the chemical nature of the corpus luteum hormone-progesterone-from the urine of pregnant women. Further research conducted in 1923 by the American biochemist Edward Adelbert Doisy (1893-1986) results in the isolation of the crystalline form of estrone, from which the actual ovarian hormone estradiol is derived[15].

The years 1923-1929 were marked in the field of procreation by the publication of many scientific papers. Dr Kyusaku Ognio (1882-1975), who specialised in obstetrics and gynaecology, published a study on the ovulation cycle in 1923, in which he set the date of ovulation as 12-16 days before menstruation. The Austrian gynaecologist and surgeon Hermann Knaus (1892-1970) extended the theory of Kyusaku Ognio[16]. The aforementioned Adolf Butenandt isolated the male hormone androsterone from urine in 1931, while the Dutch biochemist Ernest Laqueur (1880-1947) in 1935, confirmed that it was a breakdown product of the actual hormone produced by testicles testosterone[17].

Since 1930, methods of identifying female fertility based on basal body temperature have been being developed. The precursors of this method were the Dutch gynaecologist Theodor Hendrik van de Velde (1872-1937), who discovered the connection between ovulation and the phenomenon of an increase in a woman's body temperature in the middle of the menstrual cycle. His research formed the basis for the development of a thermal method for determining fertility[18].

Since 1930, the teaching of the natural regulation of conception based on basal body temperature began. The precursors of this method were Wilhelm Hillebrand, R.F. Vollmann, Gerhard Karl Döring, Jan Gerhart Holt[19]. The next phase of the research involved the discovery

15 Cf. B. Seyda, *Dzieje medycyny w zarysie*, pp. 385-389.

16 Cf. U. Dudziak, *Życie, rodzina, wychowanie*, pp. 55-56.

17 Cf. B. Seyda, *Dzieje medycyny w zarysie*, p. 389.

18 Cf. U. Dudziak, *Życie, rodzina, wychowanie*, p. 56.

19 Ibidem, pp. 56-57.

of fertility indicators in cervical mucus. It was led by P. Bergman and John Billings. Bergman's monograph describing cervical mucus was published in 1950 in Norway. Billings who was an Australian medical counsellor helping couples who were using natural methods of procreation, undertook a medical search to find indicators that would guarantee efficiency and could help couples struggling to conceive.

Dr John Billings undertook a search for a method that would prove highly effective. While perusing the medical literature, he came across a documentation from 1855 in which his attention was drawn to a study of the mucus produced by the cervix during the ovulatory phase of the cycle. The physical and chemical properties of this secretion were described in great detail. Marion Sims in 1868 while performing a microscopic examination of the behaviour of sperm in cervical mucus taken from infertile woman, found the deleterious nature of the pH of the vaginal environment for sperm. Sperm residing in these conditions was quickly destroyed. The opposite behaviour of sperm was observed in an environment of alkaline pH of vaginal secretions, it was favourable in the transport and prolongation of sperm survival. In 1913, Max Huhner continued Sims' research. These researchers were unable to explain the phenomena they discovered. Subsequent studies on the secretory cycle of the cervical glands were carried out by Sśguy and Vimeux, who have developed the scientific field of sex hormonology, ovarian physiology, separation of sex hormones and described a day of ovulation in which the structure of the cervical discharge is light, transparent and fluid. The work of Sśguy and Simonnet established the dependence of changes in cervical mucus type based on estrogen[20]. The only thing missing from the study was an opinion regarding the occurrence of cervical mucus by the women themselves. Billings began his study by asking women about the appearance and sensation of mucus on the vulva. Although all participants confirmed its presence, they did not understand its significance.

In 1962, J. Billings approached Dr. James Brown, an endocrinologist at the University of Melboure, to conduct research that would establish a correlation between the characteristics of vaginal secretions and determinations of hormones secreted during the ovulatory phase[21]. Hormone action is involved in regulating the course: hypothalamus releasing gonadotropins (GnRH), pituitary hormones affecting gland

[20] Cf. *Czynności gruczołów szyjkowych*, http://www.bigmamashaus2.de/fizjopatologia-szyjki-macicy/czynnosci-gruczolow-szyjkowych (date of access: 20.02.2024).

[21] Cf. K. Zając, B. Żak, *Miłość i płodność. Metoda owulacji naturalną metodą regulacji poczęć*, Kraków 2004, p. 93.

function (FSH, LH), prolactin, which is responsible for lactation, while exerting an inhibitory effect on the secretion of gonadotropins (PRL), ovarian hormones are involved in inducing or inhibiting ovulation (oestradiol, oestriol, oestrone, progesterone)[22].

In 1972, the American physician Thomas W. Hilgers (1943-) was introduced to the *Billings Ovulation Method*, after which he travelled to Australia in 1975 to learn the method directly from Dr. J. Billings and to take part in the ongoing studies. The cooperation between the aforementioned doctors lasted one year. In 1976, Dr Hilgers, as a lecturer in the Department of Obstetrics and Gynaecology at Saint Luis Medical University, appoints a team of experts to independently conduct further research on the *Billings Ovulation Method*. The carried out work contributes to the standardisation of the method on the basis of which in 1978 the *Creighton Model* was created. The new method initially belongs to the *Creighton Model Natural Family Planning*, after which it becomes part of *Creighton Model FertilityCare™ System* [= CrMS][23]. In 1991, after many years of work *Medical Application of Natural Family Planning, a Physician's Guide to NaProTechnology*. book is released. This is when the word *NaProTechnology*® is first used and it means *Natural Procreative Technology*[24].

NaProTechnology® is a system of fertility care built on the concept of individual work of doctors and instructors with a couple struggling with infertility. During the first meeting, a so-called introductory session takes place, during which the anatomy and physiology of the reproductive system and how the CrMS system and the *Creighton Model* work are discussed. *NaProTechnology*®, durging the diagnosis takes into account the necessary information on how the observation is carried out, the assessment of biomarkers, how the information is recorded on the cycle observation card. At subsequent meetings, the couple learns how to determine the correct ovulation day, the right time for hormonal testing, the presence of cycle anomalies. After these meetings, the couple can begin to observe the monthly cycle and record and mark visible changes on a special cycle observation card, which will be described later in the doctorate. At each subsequent meeting all the data entered on the card are analysed with the instructor. The

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22 Cf. U. Dudziak, *Życie, rodzina, wychowanie*, p. 57.

23 Cf. T.W. Hilgers, *The Medical & Surgical Practice of NaProTECHNOLOGY*, Omaha 2004, pp. XXVII-XXVIII.

24 Idem and oth., *The Creighton Model FertilityCare System. A Standardized Case Management Approach to Teaching*, vol. I, *Basic Teaching Skills*, Omaha 2022, pp. XVII-XVIII.

instructor carefully checks the card to ensure that it has been correctly filled in. After three months of meetings with the instructor, in case of further fertility problems, the couple starts meeting with a medical consultant who, on the basis of the collected material, carries out a diagnosis of abnormalities of vaginal mucus, endocrine and hormonal disorders, abnormalities of the ovary, uterus, other organs of the body[25]. This guidance allows the diagnosis to be personalised and treatment to be tailored to the individual case.

Medical advances have brought new and better ways of diagnosis and treatment. The practice of gynaecology has seen the emergence of many new tests, techniques that have become standardised, becoming an aid to standardising the treatment of diseases, taking into account not only the object, but focusing particular attention on the subject, who is to be respected by virtue of being volitionally created by God in His image and likeness.

Conclusion

Today, there are a variety of moral approaches to treat infertility. For example, learning how to pinpoint the fertile window to maximize the chance of conception with NFP use is very effective for some problems. And, some medical procedures or treatments such as hormonal medications, surgery to repair damaged or blocked Fallopian tubes, and other restorative treatments that "do not substitute for the married couple's act of loving union" can help husband and wife to conceive a baby.

Infertility diagnosis is not straightforward. In the treatment process medical knowledge regarding the correct structure of the body and its functions, the origin of diseases and their causes, the recognition of diseases and their treatment, the maintenance of health conditions, overcoming the effects of diseases is indispensable. This knowledge makes it possible to analyse and then, with the adequate tools, to take appropriate practical action[26]. It requires time, experience and the right approach to the patient, bearing in mind that they are the subject of all actions and should never be treated objectively or instrumentally and that the medical undertaken procedures serve them and correspond to their nature, goals, aspirations, capacities, values, observed rights. They concern the human being not only as an object

[25] Cf. T.W. Hilgers and oth., *Assignment Binder. Creighton Model Fertility Care Allied Health Program*, Omaha 2011-2012, pp. 2-3.

[26] Cf. A. Nawrocka, *Etos w zawodach medycznych*, p. 23.

of the applied medical procedures, but also as a specific personality who reasons, feels and lives in a specific community and above all, lives in the hope of giving birth to a child.

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