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# History of Venereal Diseases from Antiquity to the Renaissance

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**ABSTRACT** Sexually transmitted diseases (STDs), previously known as venereal diseases (VD), were present among the populations of antiquity as well as during the Middle Ages. Clay tablets from Mesopotamia, Egyptian papyri, along with mythology, paintings of erotic scenes, and presence of prostitutes give sufficient information to assume that some form of urethral and vaginal discharge, and also herpes genitalis were present among people at that time, and that these diseases were considered a divine punishment. Some passages of the Bible say much about the sexual behavior of the ancient Hebrews. The writings of the Greek and Roman physicians and of their satiric poets (Martial, Juvenal, Ovid) described diverse genital diseases. Celsus described various diseases of the genitals, that he called the "obscene parts". Galen made a strange description of the female genitals and coined the term gonorrhea – flow of semen. The ancient Chinese and Indian physicians also gave some account on the presence of venereal diseases in their books, and the temple sculptures depict their sexual life. During the Middle Ages, numerous physicians and surgeons from Europe as well as from Arabic countries wrote on local diseases of the genitals, describing chancres, condylomata, erosions, pustules, urethral and vaginal discharge, and their treatment. Some were aware that the alterations were connected with sexual activity. In spite the fact the Christian church propagated abstinence, the spread of venereal diseases was possible because the diffusion of prostitution, communal baths, and wars. During the 19<sup>th</sup> century, some of the physicians and historians, especially J. Rosenbaum, F. Buret, and E. Lancereaux believed syphilis was as old as mankind, whereas later authors had the opinion the disease appeared at the end of the 15<sup>th</sup> century.

**KEY WORDS:** STD, clay tablets, Hippocrates, Galen, Avicenna

## INTRODUCTION

Today it is well known that numerous bacteria, viruses, fungi, protozoa, and even ectoparasites can be transmitted predominantly by various types of sexual contacts. Some of these agents cause local or systemic alterations, inflammation, cancer, and sterility, and

some of them cross the placenta and affect the fetus. These diseases are encompassed by the designation sexually transmitted diseases (STDs) or sexually transmitted infections (STIs). The new terms had replaced the earlier venereal diseases (VD), a name derived

from Venus, the goddess of love of the ancient Romans. There is a voluminous literature on the history of venereal diseases, and according to some authors they are as old as mankind (1-5), but in absence of documented evidence there is much speculation and controversy. In spite of many paleopathological and archeological studies, we still do not possess any information about these diseases from the prehistoric period, and even in more recent times data about treponemal bone lesions remain controversial (6,7).

History started in Mesopotamia (the fertile crescent), where the non-Semitic Sumerians invented the first script (written word) to communicate and store information at the end of the fourth millennium BCE, followed soon by the Egyptians (8,9). From their writings that survived to our days we can get certain insight into their life, mythology, sexuality, and diseases, but the exact meaning of some Mesopotamian words still remains undefined in spite of all philological and historian efforts. With the passing of time, our understanding of diseases and VD slowly changed and evolved and many aspects of their transmission, pathology, and etiology became clearer only at the end of the 19<sup>th</sup> and beginning of the 20<sup>th</sup> century, permitting the foundation of the discipline now known as venereology.

The aim of the present article is to present an outline of the history of the most important venereal diseases from antiquity to the Renaissance. This review is rather incomplete and selective, emphasizing only part of the historical ideas and works of the physicians and laymen on this topic.

## VENEREAL DISEASES IN ANTIQUITY

### Venereal diseases in ancient Mesopotamia

From the approximately half a million of hand-sized clay tablets or their fragments, written in cuneiform script and discovered in the excavation of the buried cities of Mesopotamia (the cradle of civilization) we have obtained insight in their medicine, which was mostly theocentric, i.e. with gods or demons to whom they attributed the diseases. Thus, the treatment was to engage in supplications, sacrifices, and magical rites performed by the *ashipu* (clergyman-exorcist who used incantation to expel demons from the body), or by the *baru* (priest specialized in divination and interpretation of omens), who were able to intervene with the gods and so abolish the disease. The patients were also cured by the *asu*, a practical healer and not member of the clergy (10,11). From these early writings we observe that religion, magic, and medicine coexisted and often worked in a complementary fashion. It is of note that Hammurabi (about 1800 BCE) introduced laws and regulations to

the society and in medical practice (12). That some genital disturbances were observed and some form of urethritis was present is within the range of probability, especially if one reads the poetry dedicated to Innana (or Ishtar), the goddess of sexual love and fertility, or about the promiscuous life of Gilgamesh, King of Uruk. Additionally, we know that female and male prostitution was present in Uruk and Babylon (1,13-15). To treat diseases they used different "samu" (a word that meant plant and also drug). Recently writings by scholars on Mesopotamian medicine give more information about contagious diseases and STDs among the ancient people of the region, and describe urethral and vaginal discharge (dribbling from the vulva) possibly caused by *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, or *Trichomonas vaginalis*, as well as cases of herpes genitalis, if the patient had "babu'tu" i.e. vesicles on the genitals (16,17). These assertions must be taken with due reservation as purulent or bloody discharge from the genitals in Mesopotamia could have been a sign of shistosomiasis (17).

After the Sumerians, other non-Semitic and Semitic populations such the Accadians, the Babylonians, the Assyrians, and Hittites ruled the territory and had a similar concept and type of medicine.

### Venereal diseases in ancient Egypt

The ancient Egyptian medicine developed early, and numerous facts about the life, belief in afterlife, sexuality, and diseases of this people are recorded, although some mysteries remain. In contrast to the ancient Mesopotamian people, who had anthropomorphic gods, their gods were zoomorphic. A few medical papyri, sculptures, paintings, and poems permit us to learn much of their medicine, and we are also acquainted with the name of their first great physician: Imhotep (3<sup>rd</sup> dynasty), a human later deified (18). Morton wrote an interesting article about their sexual attitudes and infections, stressing that the absence of social upheaval together with early marriage, family life, and a relative low population had likely prevented the spread of venereal infections (19). Nevertheless, from their papyri we perceive the passion of the gods and men; there was also a kind of prostitution according to Herodotus (20), but not in the temples and oriented to soldiers, travelling businessmen, and other persons living away from home for long periods. There were also descriptions of cases of homosexuality, and some erotic papyri such as the Turin papyrus, from circa 1059 BCE, showing twelve different scenes of sophisticated positions of sexual intercourse (21,22). Herodotus wrote that there were cases of necrophilia and even zoophilia in ancient

Egypt (20). In the great Ebers papyrus, written in red and black ink that dates back to 1550 BCE but compiled from more earlier sources, according to some authors there is mention of a form of acute inflammation of the urethra that had to be treated with intraurethral application of sandal oil (23). Aphrodisiacs and drugs for impotency as well as for contraception are also mentioned in the papyrus. The venereal diseases were called "secret diseases", and from the Bible it is evident that some communicable VD were present (the story of the pharaoh and Sarah the wife of Abraham).

### Venereal diseases among the ancient Hebrews

Among the ancient Hebrews, certain venereal diseases probably existed as well, but as they left no specific medical texts, one can only find a little data about them in their sacred books, the Bible and Talmud (24). They were not written by physicians, which create problems in determining which diseases were being described. In the Bible, interestingly, there is no mention of goddesses, but female and male prostitution is mentioned in a few passages (25,26), and perhaps also treponematosi (27). In biblical times, the diseases were interpreted as God's wrath and punishment for committed sins, misbehavior, or disobedience to His will, and only He was the eventual healer (28). In the 15<sup>th</sup> chapter of Leviticus there is a description of a disease characterized by male and women genital discharge (29); some believe it was gonorrhoea (ziba) but it could be also chlamydial urethritis (30). In such cases the priests advised the patients to keep far from one-another for seven days. Their clothing, bedding, and also the drinking vessels were "unclean" and had to be avoided contact with. In the Book of Numbers it is written that 12000 Israelites after the war with the Midianites returned with a "gleet" and 24000 enslaved women. Moses, seeing their illness, ordered the slaughter of the women and a quarantine of 7 days for his soldiers (31); from the Bible we also know the patriarch Job had a strange skin disease, later believed to be syphilis, and that Solomon in the "proverbs" advises men to avoid loose women (32), even though he had many wives and concubines. Their medicine was thus almost preventive and in the hand of the clergy. Only later with the influence of Hellenism on Judaism, physicians had some function.

### Venereal diseases in ancient Greece

There is more information about sexual life and VD among the Greeks, whose culture developed after the end of the Aegean and Mycenaean cultures.

Greek achievements in literature, science, philosophy, and medicine are well known (33). Nevertheless, they owed some debt to the Egyptian medicine and beliefs, which in the classic period became anthropocentric and realistic. There exists much documentation about their sexual attitudes, preferences, and infections (34), even if the family (oikos) was the basis of the society in their city-states (polis). From mythology we know their gods and goddesses had numerous sexual liaisons, and erotic scenes are common in their sculptures, paintings, and literature already in the 8<sup>th</sup> century BCE. Hesiod in his poems wrote that the first women, Pandora, caused all problems on the Earth by opening her box; and the author knew that summer was the season for love (35). Aphrodite (Greek "aphros" is foam i.e. born in the sea) was their goddess of beauty and love, and there was a cult of the phallus too (1). There is no doubt that the Greeks tolerated all forms of sexual activity. Homosexuality was common, as we can see from numerous vase paintings, and Plato, a philosopher and contemporary of Hippocrates, wrote with sympathy about it. The active, older male was the "eraster", while the younger, passive one was called "eromene" (36,37). Lesbians were tolerated, as well as prostitution. Solon (one of the seven wise men) in the 6<sup>th</sup> century BCE was the first to approve the institution of city brothels in Athens (38). There were different classes of prostitutes, among which the most intelligent and sophisticated were the hetaerae. Amid the most famous of them was Aspasia, so beautiful that Pericles, Socrates, Alcibiades, and many other men fall in love with her. Slightly less prestigious were the auletrides, specialized in flute playing and dance, whereas in ports like Piraeus and Corinth the most common prostitutes were the dicterades (38).

Hippocrates (460-375 BCE) separated medicine from superstition and religion, was the first to collect clinical cases, provided us with a rich medical vocabulary, and in his oath advised the physicians to avoid any form of seduction of women and slave men when in a house. The Hippocratic corpus explains that diseases arise from a disbalance of the four bodily fluids (blood, yellow and black bile, and phlegm), and that the semen derived from the complete digestion of nutrients (39). Hippocrates recommended frequent sexual intercourse as a desiccative measure for conditions characterized by oversupply of phlegm (40). It seems he called acute gonorrhoea "strangury", thought it was caused by indulgence in the pleasure of Venus, described vaginal discharge – "leucorrhoea" (fluxus) – in women, as a consequence of their anatomic characteristics (in Mulieribus morbi), and distinguished different types: *albus*, *rufus*, *ruber*, and

*niger* (41). He also mentioned some ulcers on male and female genitals, but this was surely not syphilis; it could have been herpes genitalis, and if phagadenic perhaps chancroid or tuberculosis (42). In examining women he already used a kind of vaginal speculum. The descriptions of genital excrescences in adults were probably genital warts (i.e. human papilloma virus infection).

### Venereal disease in Rome

The ancient Romans according to Pliny were for a half of a millennium BCE without any physician. Their healers were the *pater familias*, and they believed in a hundred of gods and goddesses, among which was the attractive Venus. However, already Lucretius Caro in his "De rerum natura" wrote on "*venere volgivaga*" (wandering venus) (43). The presence of numerous loose women and prostitutes in antique Rome is already well documented in the comedies of Titus Maccius Plautus (44); they were also called *meretrices* because "quae corpora meret" i.e. earn through their body (45). There were different classes of prostitutes, among which the most talented were the *delicatae* and *famosae*, but Ovid in his "Ars Amatoria" (III, 315-340) had the opinion their knowledge was rather poor compared to that of the *heterae* (46). Around 100 CE there were about 32000 meretrices in Rome (38), and they had to wear deep colored men's clothing; in Pompei there were about 30-35 brothels or meretriciae. Numerous paintings of sexual activity had been recovered in Pompeii, and also some inscriptions from which is visible that people were accustomed with homosexuality, fellatio, and even cunnilingus (38). Among the writers who wrote books about the different coital positions was Elefantide, (a woman that lived in the 1<sup>st</sup> century BCE). The title of the book was "De figures coitus", but no copy of the book has been found (45).

In the second and first century BCE Rome ruled the entire Mediterranean region and many Greeks physicians immigrated to Rome. At first the Romans looked askance on them, but with time they became the best physicians: Asclepiades, who propagated the "solid pathology" and is known for his therapy "cito, tuto et jucunde" (quickly, safely, and pleasantly), Dioscorides the father of medical botany, and Galen (see below). Among the Romans, the most important writing on medicine, the first in Latin, and the first who wrote the history of ancient medicine was Aulus Cornelius Celsus (25 BCE to 50 CE). He wrote in excellent and elegant Latin so that later he was named "the Cicero medicorum", and interestingly he was not a physician (47). His book "De medicina" (eight books) described skin diseases and different VD in the 4<sup>th</sup> and

6<sup>th</sup> book. He called the genital parts of the body *partes obscenes* (obscene parts) and reluctantly described their diseases: balanitis and some form of urethritis as "profusio seminis" that occur without sexual desire and in some case can lead to inflammation of the testis, fever, and even tabes i.e. wasting (but certainly not tabes dorsalis syphilitica) (48). He also mentioned various ulcerous lesion on the genitals (*ulcera pura, siccaque, et ulcera humida et purulenta*), but the succinct descriptions do not allow us to tell with certainty whether this was *ulcus molle*, *ulcus durum*, cancer, or other diseases (42) He advised treatment of vaginal effluvium with wool tampons embebed in various drugs (48). Additionally, he clearly described scabies (49), inflammatio colli (probably paraphymosis), and genital warts (*condylomata acuminata*, but some later believed it was perhaps *condylomata lata!*). These warts the Greeks called thymia, and the Romans ficus, but they knew nothing about their causes (41). These excrescences were also well known to the Roman morbid writers and satiric poets such as Valerius Martialis (in his epigram "the familia ficosa") and Junius Juvenalis, in the 1<sup>st</sup> and 2<sup>nd</sup> century CE, and they knew that they were transmitted by sex and frequent in homosexuals (50,51). Male to male sex was common among ancient Romans (see above, 38), and is well demonstrated by certain pottery and paintings depicting these acts, found in different places (45,52).

Following Celsus, an interesting person was Gaius Caecilius Pliny (23-79 CE), who also was not a physician but an encyclopedic writer. In his "Natural History" that is characterized by a large bibliography, he wrote that men had frequently *profluvium genitalis viris*, probably a discharge from urethra that was treated with chicory, and women *profluvium albus* (53). He also mentioned ulcerous lesions, probably chancroid (51), and warts on the genitals.

In the same century, Aretaeus from Cappadocia wrote his work entitled "On the Causes and Symptoms of Chronic Diseases", containing a section about urethral discharge, which was not a deadly disease, and the flux was also present during sleep in men and in women as well, sometimes accompanied by pruritus (54). The description of the discharge being thin, cold, colorless, without pain and not purulent is hard to associate with gonorrhoea; it was probably non-gonococcal urethritis, spermatorrhoea, or post defecation prostatorrhoea (30). In his manuscripts, Aretaeus wrote that satyriasis and gonorrhoea had the same cause, described ulcers in the urethra, and advised treatment with a mixture of honey in water and milk (54).

In the second century, Soranus of Ephesus (98-138 CE), the leading physician in gynecology,

obstetrics, and pediatrics (47), who used the speculum to examine the vagina, recommended a hard bed for the treatment of gonorrhoea for both genders (2), and wrote that bathing of the eyes of the newborn prevented ophthalmia gonorrhoeica natorum (31). His manuscript "Gynaecology" was famous for a few centuries and believed virginity in both sexes was the healthiest state, less susceptible to diseases (55). This ideal of virginity and celibacy became the most important virtue propagated by the western Christian Church, whereas this was not the case in the Eastern Christianity (56).

The most prominent Greek physician in ancient Rome was Galen from Pergamon (131-200 CE), who was an accurate diagnostician, prolific writer, and performed experiments and dissections of animals, among which some on the function of the urinary tract (57). On the basis of the anatomical works of Herophilus and his own he believed the genitals of males and females are similar, but in males they are outside, whereas in female inside because they are imperfect and lacking in vital heat. The ovaria were a sort of testes posed laterally to the uterus, and the uterus and vagina corresponded to the penis (58). This strange anatomy remained unchanged for centuries: so even in the XVI century Berengario da Carpi, an important anatomist and surgeon, in his "Isagoge brevis" (1522) presented figures with similar aspects of the women genitals (59). Galen described the discharge from the urethra as a unwanted excretion without erection, for which introduced the name gonorrhoea (from the Greek gonos=semen and rhoia=flow), that represented a mistake, as it signified the flux of semen. The cause of the flux was in a weakness of the spermatic vessels (51). He mentioned also different types of ulcers on the penis, noting the precise location on the glans, prepuce, and root and the consistence of the border, but it seems that he did not associate them with sexual activity (2). He also described condylomata acuminata, and the inguinal "buboes" (possibly in case of *ulcus molle*) believing they originated from alterations in the liver (39). His system of treatment was based on the use of *contraria contrariis curantur* (cure is obtained by the opposite).

Probably the last great physician of the ancient era was Oribasius, born in Pergamum in 325 CE, who worked in Byzantium under various emperors and died there in 403 CE. He wrote a few books in which he preserved the writings of earlier ancient physicians and accurately named the original authors; in his "Synopsis" he described diseases of the genitals such as condylomata (41). His description of exanthemata in children were later believed to have possibly been congenital syphilis (2).

## Venereal diseases in ancient India

There is little to say about VD in the first civilization that developed in the Indus valley. Some archaeological excavations in Maheniodaro showed some aspects of their urban culture. More written data begin to turn up after the invasion of Aryans from central Asia in ancient India, circa 1500 BCE (60). Their oldest sacred books, the Vedas (knowledge), and the Atharva Veda contained some information on venereal diseases, aphrodisiacs, and treatment of sexual dysfunctions (61), but they were not scientific treatises. More important are the later Ayurveda (knowledge of life), preserved predominantly in the Sanskrit language and originally written on birch bark or palm leaves, that was derived through Buddhism, and evolved a system of medicine that later only changed little with time. According to Ayurveda there are five constituents of the universe and of our body: air, water, fire, earth, and void (62). The classic Ayurvedic medical works were Charaka Samhita (i.e. Charaka's compendium), in six volumes in which there was mention of different genital diseases, discharge and therapy, and surgery in Susruta Samita (Susruta compendium) written in Sanskrit, but there is evident disagreement about how old they are (63). Both contain chapters dedicated to the diseases of the genitals, genital discharge, genital warts, and their medical or surgical treatment (61). There are numerous erotic sculptures painted on their old temples, and Mallanaga Vatsyayana wrote the famous Kamasutra. Prostitution was also present in Ancient India, and there are passages in the Kamasutra and in the script of Kautilya about its importance (64,65).

## Venereal diseases among the ancient Chinese

Regarding VD in ancient Chinese medicine, one can find two chapters dedicated to VD in the legendary "Huang-Ti Nei Ching" (The Yellow Emperor Book of Medicine), in which, according to some older authors, there is a description of gonorrhoea and of syphilis; the latter was treated with a mercury ointment (3,4). This opinion is outdated, and some concepts of traditional Chinese medicine are rather abstract and vague. The new finding of a number of silk manuscripts, seven of which medical, discovered in the Tombs of Mawangdui (buried in 168 BCE) in 1973, gave new data about this classic book, together with some notes on sexual life amid the ancient Chinese (66-67). Prostitution and brothels were present during the Han Dynasty (2<sup>nd</sup> century BCE to 1<sup>st</sup> century CE), and it is mentioned in the "Million" of Marko Polo (13<sup>th</sup> century) (65,68).

At the end of this section dedicated to VD in the Old Age, we must emphasize that it is strange that

the ancient physicians did not recognize sexual contagion as a cause of these diseases. This can be partly explained by the long incubation of some VD, shame in describing such diseases (Celsus), the patient's fear and shame of going to a physician, the theory of miasmas, and the fact that physicians tried to explain the majority of diseases with the theory of the four humors for more than a millennium in accordance with the writings of Hippocrates and Galen. The presence of different types of prostitution (the oldest profession), description of sexual attitudes among the ancient Romans, and erotic literature together with the promiscuous life and debaucheries of many Emperors such as Julius Caesar, Caligula, Nero, Messalina, and Elagabal lead some authors (1-3) to believe that gonorrhoea and syphilis were present in Rome and in other parts of the world. Later I. Bloch, E. Jeanselme, and J. Rolleston (69-71), and one of the greatest historians of medicine of the 20<sup>th</sup> century Mirko Grmek, gave a concise and deep analysis of this possibility, and came to a negative conclusion, especially for syphilis (42).

### **VENEREAL DISEASES DURING THE MIDDLE AGES**

In 395 CE, the great Roman Empire was divided into the Western and the Eastern Empire. The Western part then rapidly declined. Numerous factors contributed to the fall of the Western Roman Empire (476 CE): the invasion of the Goths, the spread of Christian religion, a too vast occupied territory, internal perturbation, epidemics, and others (12,72). This marked the beginning of the Middle Ages (in Croatian and in some other languages the singular is used – Srednji Vijek = Middle Age), or the "Dark Ages", in which science, arts, economy, and medicine declined. In medicine the Galenic ideas prevailed (*ipse dixit*) and little new was added, as God determined the destiny of men, consequently physicians became unnecessary, replaced by prayers and miracles. In 391 CE, the famous library of Alexandria was once more set on fire and completely destroyed. It became important to pay more attention to the soul than to the body. Christ bade his disciples to "heal the sick" (12), and the Christian doctrine recommended an ascetic life, chastity, and purity as a moral and religious duty, with marriage as a holy institution necessary only for procreation. This "strange philosophy" propagated by the greatest Church minds was associated with strange treatments by the physicians, superstitions, and astrology.

### **Byzantine medicine and venereal diseases**

In the Orient, after Constantine the Great became

emperor of the whole Roman Empire (324 CE), only Byzantium continued to slowly develop for a few centuries in spite of political and religious contrasts (the Nestorians schism), and resisted as such to 1453, when it was conquered by the Turks. In Byzantium (later Constantinople) there worked some distinguished physicians such as Aetius from Amida (502-575), a town near the upper Tigris. He is known for having introduced the term eczema, and in his sixteen books on medicine (later named tetrabiblion) described profluvium seminis, genital and anal warts "exrescentiae turgid, asperae, subrubra" (turgid, rough, rose colored papules) (72,73), and wrote on ulcers and exanthemata of the genitals. Interestingly, he also mentioned hypertrophy of the clitoris and believed it was linked with exaggerated sexual behavior (74). Another important physician was Alexander Tralles (523-403) who after his studies in Greece and Alexandria travelled through Europe and returned to Byzantium wrote his "Twelve medical books" in which he described genital discharge and condylomata (2). In the next century, Paulus from Aegina (625-690), who studied medicine in Alexandria, wrote on surgery, gynecology, and on genital diseases in his "De re medica" in seven books, mentioning thymia or verrucae in pudendas (condylomata). In Book IV he described the external diseases and genital diseases in men and women: genital discharge and ulcers that were treated with aloe dust (pulvis) or with pine-tree bark. Such ulcers were later believed to be symptoms of syphilis (75). After these authors there were other physicians, however they wrote only compilations based on the works of Hippocrates, Galen, Soranus, and Aetius, and their work had little originality and added little to the knowledge of VD. Thus, the Byzantine medicine preserved the medical knowledge of the ancient world until the arrival of the Arabs (60).

### **Monastic medicine and the forming of the first medical schools**

Already during the decline of Roman Empire, the Christian Church faced some problems due to rapid spreading, but consolidated with time, became better organized, and the people trusted the priests. Monks and especially the Benedictines tried to care for orphans, the infirm, and pilgrims; some monks and priests became physicians, among others St. Cosmas and St. Damian that suffered martyrdom under Diocletian. Later, the Bishop St. Isidore of Seville (550-636) wrote on medicine in his "Etimologiae". The monks were the only educated people for a long time (63); numerous medical manuscripts were collected in the monasteries that also had infirmaries and cultivated various herbs in their gardens. Naturally, saints

were invoked in many cases. Clerical and lay education progressed somewhat during the reign of Charlemagne, who also tried to oppose some superstitions (75).

In Europe, VD was frequent during this period, due to the diffusion of promiscuous life, wars, prostitution, and brothels (31,71), and it became evident that some diseases could be transmitted by sexual intercourse, which is evidenced by a London act (1161) forbidding women affected with burning of the genitals to enter the brothels (31).

During this period lay medical schools also developed. Especially important was the first medical laical school (schola) founded in Salerno, where Constantinus Africanus (1020-1087) taught and translated numerous medical manuscripts from Arabic to Latin (the books of Hippocrates, Galen, and of some Arabian physicians) (72). He also described gonorrhea in his works as "*sperma sine voluntate concupiscentia est*" (flow of sperm without sexual desire) (2). Later he lived and died in Monte Cassino. Interestingly, in the Salernitan medical school there worked a few women, among which the most famous was Trotula, who wrote on women's diseases (72). In 1231, Fredrick II, king of Sicily and emperor of Germany, decreed that the license to practice medicine could be gained only after an examination in Salerno. The famous "Regimen sanitatis salernitanum" written in verses was for a long time a medical bestseller, and translated into many languages. Next was the school of Montpellier.

It is interesting that among the first who wrote about sexual intercourse as the cause of infection was the Abbess Ildegard of Bingen's monastery (1099-1179), a wise, polymath woman who, due to her high moral authority, had a rich correspondence with emperors, kings, and popes (76). In her book "Cause et cure" (book 2, chapter on Lepra), she described a form of leprosy in "*homines de libidine incontinentes*" (lustful men) that could be cured, characterized by erosions and crusts, which some authors considered not leprosy but syphilis (41). Another capable physician, surgeon and clergyman that wrote about lesions after coitus was Guilielmus de Saliceto, born in 1210 near Piacenza. He worked and taught in various Italian towns, and in his renowned book "Chirurgia" (1270) he wrote that white or reddish pustulas and gonorrhea developed on the penis after "*coitum cum foetida mulier aut cum meretrice*" (copulation with an unclean female or with a prostitute), due to the accumulation of sub-preputial "filth" (31), and described other diseases of the genitals such as condylomata, ulcera dura, ulcera mollia, ulcera phagadenica, and inguinal bubas, all developing after coitus. Therefore,

he was well acquainted with the origin of VD, and for prevention advised postcoital washing with cold water or vinegar (41), but used mercury ointments for some ulcers. He died in 1280. Roger of Salerno (13<sup>th</sup> century), who in his "Practica medicinae" called the discharge of the urethra accompanied by pain and difficult urination "rheumatisatio virgae", and treated the affliction with leeches applied on the saphena vein or by urethral irrigations (2,31). He also mentioned ulcerous lesions on the penis, which he treated surgically.

Some English physicians and surgeons also studied in Salerno. Gibertus Anglicus, who studied in Salerno and lived mostly in Europe, wrote in his voluminous "Compendium de medicinae tam morborum universalis" on sterility and impotence and claimed that copulation with a woman that had had intercourse with a patient suffering from leprosy could be the cause of various penile disorders and pustulae. He also used the term "gomorrhoea" alluding to the discharge from urethra, which originated from sodomitic and wicked copulation (42).

In 1305, Bernard Gordon, who was professor in Montpellier, in his "Lilium medicine" advised treating the urethral discharge with baths, emetics, and blood-letting, and for gonorrhea also used the term "gomorrhoea" because of anal copulation; leprosy was also transmitted in such a way (39). Other physicians such as John of Arderne (circa 1307-1377) called urethral discharge gonorrhea or "incendium virgae" (72).

In his "Chirurgia magna", Guy de Chauliac (1290?-1368), who was also a famous surgeon and priest, emphasized, similarly to Saliceto, the need for a surgeon to know anatomy and medicine. In the treatment of Galen's gonorrhea he recommended extract of cantharides (Spanish fly) as a contraindication, and in obstinate cases, fleas or lice (31).

Pazzini, in his book on the history of medicine, concluded that gonorrhea was well known during the period due to the diffusion of prostitution (and it should be noted even Thomas from Aquino expressed the opinion that it could not be abolished), numerous wars, and presence of city baths where young people enjoyed themselves (77).

### Arabian medicine and venereal diseases

During the Middle Ages, some data on VD can be found in Arabian medical texts, but some believe it is better to speak of Islamic texts rather than Arabian because many were written in Persian, Syrian, or other languages. Islamic physicians gathered a lot of data from ancient Greek, Roman, Byzantine, and Indian physicians and had a few contributions of their



own, especially during their "Golden Age" 900-1100 CE (50). The most famous translator of Hippocrates' and Galens works into Arabic was Hunayan-ibn-Ishaq (809-884) born in southern Iraq. After studying in Alexandria and Baghdad, he remained there for the rest of his life. He was the creator of the Arabic scientific terminology. In Europe he was known as Johannitius and his work "Isagogae" was very much appreciated (78). The first Arabian physician that we know of was Ali ibn-al Tabary, who studied medicine in Jundishapur, and wrote "The Paradise of Wisdom". He believed sexual activity is bad after a meal, and recommended intercourse only with young women (79). Among the first gifted physicians was the Persian Rhazes (865-930) who was also interested in philosophy, music, alchemy, and other pursuits. He became director of the hospitals first in Ray, then in Baghdad. In his work "Continens" there is a good description of small-pox and other exanthemata, but his superficial description of ulcers (apostemata) on the genitals, and pruritus genitalis are not clear enough to recognize VD. He also described gonorrhoea, which was treated with instillations of goat or breast milk (79). Rhazes was the first to introduce experiments on animals to demonstrate the efficacy or toxicity of drugs, especially mercury (41,81). After him, important work was done by Aly Abbas (+994), a Persian physician who clearly differentiated, in his "Liber regius", spermatorrhoea from urethral discharge, the latter being a kind of infection, characterized by a burning sensation during urination and thick discolored pus (2,41).

Another eminent Persian physician was Ibn Sina, known in Europe as Avicenna (980-1037). He was a precocious child, and had an adventurous life filled with romance. Nevertheless he wrote numerous voluminous books. Of special note is his "Kitab al-Quanufit-Tibb" in five books, translated into Latin in the 12<sup>th</sup> century in Toledo by Gerard of Cremona under the title "Liber canonis medicinalis" or simply "Canon". In Book III he dealt with special pathology, describing it "a capite ad calcem" (from head to feet); he also wrote on ulcers on the penis as well as anal ulcers, which sometimes had to be surgically treated. The urethral discharge was caused by "acuitas urinae, multitudo coitus", later defined as "ardor urinae" for which he advised a diet, avoidance of coitus, and irrigation (2,41). In the section dedicated to love, he classified it among mental disorders together with mania and insomnia. He also described leprosy, a certain form later regarded as syphilis (41), and advised that mercury, due to its toxicity, had to be used only externally for scabies, lice, and ulcers (2,81). Another famous physician was Abulcasis (936-1013), who practiced in Cordoba and wrote a medical encyclopedia in 30 books. The thirti-

eth book is a text of surgery, divided into three parts. In the second part he described operations on male and female genitals. For urethral strictures, perhaps as a consequence of gonorrhoea, he used silver catheters, greased before introduction with butter and oil (79).

A prominent physician was also Maimonides, a Hebrew born in Cordoba in 1135. As a young man his family had problems with certain Islamic sects, so they went to Morocco, and then because of new persecutions fled to Cairo where he acquired fame and died in 1204 (82). He was also a great philosopher as well as a distinguished rabbi, and had an interest in mathematics and astronomy. In his famous "Aphorisms" he wrote about gonorrhoea i.e. an urethral discharge without erection and pleasure that sometimes originated from sexual excesses (50). He wrote also the book "Ars coeundi" (art of copulation), containing 19 chapters, and in the book "On Asthma" he advised such patients to restrain from sex (79).

During this period many hospitals were funded (Bagdad had 60 in 1160) and medical schools but in the next century the Mongols (1258) conquered Bagdad, destroyed it, and the Eastern Arabian Empire was ruined. The Christians in Spain conquered Cordoba, Seville, and Granada, which caused the decline of the Arabian culture.

### Venereal diseases and sexuality in medieval Croatia

Finally, a few words to describe the sexual life and attitudes among the Croatian people during the Medieval Ages. Data can be found in some moralistic texts, mostly written by priests in vernacular language, in Glagolitic script. There was a negative attitude towards women, as in other parts of Europe, sexual relations were considered sins of lust, and the soul was more important than the body (83). Nevertheless, prostitution was present, particularly in the ports of the Adriatic coast; data from the old statutes from Dubrovnik and other cities confirm this; there were also cases of homosexuality, as well as some diseases of the genitals. The patients were treated by few foreign physicians mostly in the towns. The first cases of syphilis appeared in Dalmatia at the end of the 15<sup>th</sup> century (84).

From the above, we can establish that neither physicians, surgeons, nor historians or others used the term *morbus venereus* during the described period. Later, in the 19<sup>th</sup> century, some physicians and historians, particularly J. Rosenbaum, F. Buret, and E. Lancereaux (1,3,4) believed syphilis was as old as mankind, whereas in the 20<sup>th</sup> century I. Bloch, E. Jeanselme, and M. Grmek (42,69,70) had the opinion that the disease appeared only at the end of the 15<sup>th</sup>

century. One of the problems or difficulties of modern readers is the use of different names for the same disease by various authors, as well as the use of the same term for several diseases; in some cases there were errors in translation or transcription, and the description of the diseases was usually inaccurate (85). At the end of this period, it became evident that the medical profession was divided into physicians who treated internal diseases and surgeons that were concerned with skin and genital diseases.

## CONCLUSION

From the presented data one can see that in antiquity little was known about VD, whereas in the Middle Ages, that lasted about a thousand years, some physicians and surgeons believed that certain afflictions of the genitals were connected with sexual intercourse. They could only describe some types of VD, but knew nothing about the *causa vera* (true cause) i.e. the microorganisms causing VD, and some were convinced that a kind of venom was transmitted by sexual intercourse (concupitus venenatum). A definitive diagnosis without the aid of microbiological analyses remained impossible to physicians for a half a millennium. During antiquity and Middle Ages, neither physicians, nor historians, nor others used the term "morbus venereus". Some guessed at the importance of sexual intercourse in the development of local genital lesions, but did not understand the cause of general diseases.

Some STDs were presented even in ancient times, in the Middle Ages, as well as today. STDs are very important contagious diseases in the 21<sup>st</sup> century, especially as concomitant infections. Our contribution describes some important aspects and outlines the history of VD, from antiquity to the Renaissance.

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