



History of infectious diseases development in the Old and the Middle Ages with the emphasis on the plague and leprosy

Istorijat infektivnih bolesti u starom i srednjem veku sa osvrtom na kugu i lepru

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Introduction

For centuries branded as enigma infectious diseases are as for the common man, and the scientific community, the largest item of interest. Their contagiousness, number, as well as increasing diversity, led to the appearance of enormous challenges in finding the cause for a more effective control. Mass infectious diseases such as leprosy and plague were witnesses and causes of horrific suffering throughout the ages. The valuable data available to us, recorded by the physicians and historians, are the best proof of undisputed reign of illness that marked the old and middle ages.

History of infectious diseases of the Old Ages

For sure, the infectious diseases and outbreaks of the same, existed in prehistoric times, as surely they did not get the image of a mass phenomenon until man has not started reside in larger communities.

Based on skeleton results, drawings and objects originated in prehistoric times, we can see nowadays the level of development of medicine at that time. Disease at curing that period is almost impossible to prove. It is known that primitive tribes attributed the causes of diseases to magic^{1,2}.

At ancient times, every disease used to be explained as supernatural, and anger against people in accordance with religious beliefs. Thus, first attempts at combating infectious diseases, and diseases in general, were prayers to God¹. Babylonians also had a deity-like fly, which by their belief brought the plague, which leads to the assumption that the old people had the idea of insects as vectors of pathogens. Unfortunately, this and many other assumptions about the outbreaks in the Old Century, are difficult to prove because of the insufficient and incomplete number and types of data available to us^{1,2}.

It is certain, however, that the emergence of diseases and the increasing number of victims pointed out the urgent need for prevention, finding the causes and efficient treatment procedures. Egyptians defended themselves of infections by garlic, while the later struggle in Rome continued by using cabbage³.

In ancient Greece, Hippocrates was the first to hold certain dangerous substances, so-called. "miasmas" and although not stated as possible human transmission, it was very close right to the genesis of infection by states that they occur by inhalation of hazardous substances².

Other cultures of ancient people before the Greeks, did not come across supernatural causes of infectious disease, but not much progress in the discovery has been made thereof. The ancient Chinese, however, employed a method similar to immunization against measles¹. Galen (Figure1), was a great Roman physician, whose medicine considered plague as epidemic disease, stressing that "if a disease fall upon many people, it is epidemic". His interpretation of the disease was in the fact that the heart is rapidly freeing enormous heat and "harmful liquid" and hence fever and other symptoms. Asclepius, however, spoke of "big atoms" that clog the pores of the skin. Diodorus and Thucydides, wrote about the mass infections, from "infection Attic" and "Athenian plague" in great detail. Based on old data, it became obvious that some of the prevention, and treatment could be a word^{1,2}.

It is certain that the Old Ages already knew a number of infectious diseases as such, but judging by the number and type of infections described, it seems that the most common was the plague⁴. Thucydides described as "the Athenian plague" that ruled from 435 to 430 BC, which had its way from Ethiopia, Greece, Rome and finally Dalmatia. It is assumed that plague was in fact typhoid fever, which ended the "golden time" of Athens and destroyed citizenship and sol-



Fig. 1 – Galen (130–200).

diers of Athens^{1, 5}. A terrible plague epidemic struck the Roman Empire next to the eruption of Vesuvius, to a similar repeated in 166 when thousands of people died. Extinguished after 16 years, Galen had this disease himself, so he described it in details in his writings, although there were data that it could be even typhus or smallpox. The disease was brought by the troops from the Middle East and then killed about 5 million people. Next, the so-called “Cyprian Plague” was in a period of 251 to 266 although the above description of this period was probably the smallpox. In addition to plague and smallpox, malaria was one of the most dangerous infectious diseases in the Roman Empire, which was even accused in some writings for the cause of the collapse of the Roman Empire, because for a short period it devastated people and soldiers of Rome^{1, 2}.

At the turn of the Old in the Middle Ages, the 531 to 580 “Justinian Plague” took a large number of lives, and although no detailed epidemiological data it was probably “bubonic plague” also called “plague of Procopius”. Procopius described this plague and stated that during his life of 50 years it destroyed a half the population of the Byzantine Empire^{2, 6}.

The largest amount of data that tell us about infectious diseases that were prevailing in the Old Century makes an important epidemiological interpretation and notes, but they are based on descriptions of the affected population and the general suffering.

History of infectious diseases in the Middle Ages

Although in ancient Greece and Rome began to pay attention to hygienic conditions and living conditions of the population, this achievement did not come to life in the Middle Ages. Orientation towards religion and church of this period did not leave time for adjustment and sanitation of the cities. Medieval cities were charged, filth, without adequate discharge of waste, no clean drinking water and streets crowded with dead animals⁷. Besides these, for the infectious diseases ideal conditions, were favorable conditions for the use of potable water from impure water wells and

streams, and public baths, used by people suffering from various kinds of diseases, along with healthy people.

Sanitary regulations were known by 1104 in Augsburg, as well as concern about cleanliness of streets and houses, and food^{2, 7}. Unfortunately, the causes of infections are still called “miasmas”, blaming demons and witches, and even as alleged in the statement of the Medical Faculty in Paris in the 14th century and “contrary planet embroidery”². Epidemics are called “pestis” or “pestilentiae”, regardless whether it comes out of plague or not, and most historians described them. Infectious diseases were further described by the first Arabian doctors. One of the most common method of treatment in the Middle Ages was the so-called “bloodletting” (Figure 2).

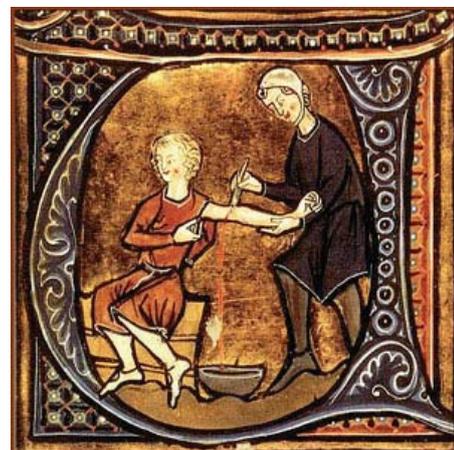


Fig. 2 – Blood drawing.

There were certain rules regarding personal hygiene, maintenance of facilities and waste disposal that came into force in the late 14th century. The Parliament in England dealt with them, and in 1388, adopted the provisions that concerned sanitary waste disposal⁷.

Girolamo Fracastoro (Figure 3), Italian physician, pointed to “seminaria contagiosum” – small beings as agents of infectious diseases.

Among the most significant epidemics of the Middle Ages was the epidemic of plague and leprosy.

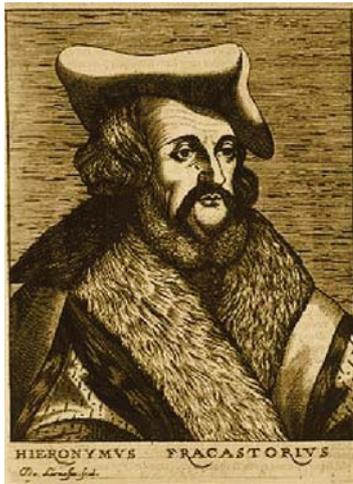


Fig. 3 – Girolamo Fracastoro (1478–1553).

History of plague development in the Middle Ages

Also called “Black Death” because of massive black bruises on the skin, the plague began his infamous rule in the 40-es of the 14th century in the Northern China and Mongolia and then spreaded throughout Asia, Europe and Africa. In Asia, then, not counting China, killed more than 20 million people^{2,6,7}.

Southeast Asia was an endemic area for the development of plague. Bad living conditions in the Asian region, where people lived together with animals, with many carriers of disease, such as rodents, and insects, were suitable for the beginning of plague^{8,9}. Although they did not know any causes or nature of the disease, in China practiced burning of dead rats at large squares, and escaping into the surrounding forests, until it settled dying rats. It was believed that plague was spread by wind, so people stayed in houses with closed windows². In Egypt and Syria, plague spreaded in 1346. Plague was caused once by the rats population density, from which fleas transmitted the disease, the human approached, the traffic from Asia to Europe developed rapidly, and the hygienic conditions and circumstances worsened^{5,10}.

Italy was the first country in Europe where plague appeared in 1347 when in Venice died about 100,000 people². Plague arrived in Sicily, by Italian ships that came from the Black Sea when the crew was found dead, covered with purulent blisters, and the ship was crowded by rats. Then, in Vienna died about 40,000 people. A large “mortality”, as they called the plague, took heavy casualties and about 43 million people, of whom 25 million in Europe. In Russia, plague arrived in 1349 carrying death, famine, atrocities, and tremendous changes in the sociocultural and political life. Continuing his deadly rampage, the plague arrived in Dalmatia, and the suffering in Split was best described by archbishop Marin Cuthais who stated that “the disease first appeared in animals” and than in people. He stated that “a man seized by disease, first weakened, and then had on the body red pimples, accompanied by severe fever”^{1,2}.

The symptoms of the disease were fever, chills, headache and bloody blisters. Plague could be divided into three types: simple-frequently, septicemic and pneumonic^{8,9}. In medieval Serbia, people called the plague “cuma” and it was one of the greatest curses that could befall a man. Thanks to the Hilandar code we know that doctors used drugs of plant and animal products, and cupping^{11,12}.

All measures undertaken by the doctors were left without success, since squares, houses, streets were full of corpses of patients, which were fed to rodents, birds and animals. For their own protection, doctors had a special suit used in contact with patients, and many were hiding and fleeing from infection^{2,7}.

From time to time doctors agreed to examine patients for a high fee when they used sticks to touch them. A special waxed suit was first used to treat fever only during the plague epidemic in Marseilles in 1531. Doctors had a hat and gloves, while the mask in the form of bird face had glass-covered openings for the eyes as well as opening for the nose-shaped beak filled with fragrance believed to purify air. Not knowing anything about the causes, the only salvation people were looking for at churches, prayed to and sacrificed for the Saints. There was a special group called themselves “flagellants”, convinced that throwing out the sins, by scourging, would make them able to protect themselves from plague in that way^{2,7}.

The treatment of fever was done by onion, garlic, arsenic, even the leaves of tobacco. After 7 years of the rule, abruptly as it began, stifled the epidemic of plague. During the 15th century, along the whole of Europe, emerged as a pandemic of plague, spreading rapidly by the development of traffic, but in a significantly less extent than the 14th century pandemics. It is believed that the bubonic plague during the Middle Ages destroyed a third of the European people. Until 19th century, plague continued with hundreds of outbreaks in Europe, and it is still present in some parts of the world today^{4,6}.

As noted, the doctors of the Middle Ages did not know the causes of plague, and so there was no adequate therapy. For the pope’s doctors, “plague is a new and unknown disease” with clinical picture described in details, including enlarged glands and pneumonia. Unfortunately, old drugs such as “mithridate” and “teriyak” and bloodletting yielded no results. A significant progress in curbing infectious diseases, introduced quarantine and enforcement of sanitary measures, and the plague during the 18th century slowly eroded^{1,2,10}.

First measures of isolation were present even in Milan and Venice in 1374. The first official quarantine was open in 1377 in Dubrovnik, where passengers who came to Dubrovnik from infected areas, spent at least 30 days at certain places, such as Cavtat before boarding. Later it increased to 40 days Italian word quaranta means forty, so this type of insulation was called quarantine. The importance of quarantine was high and made all the other outbreaks considerably less pronounced^{2,11,12}.

Much later, in 1894 Kitiyato and Yersin discovered the cause of plague, independently of one another, and the epidemic of plague stopped only during the 19th Century⁶.

History of leprosy development in the Middle Ages

Leprosy, which translated from Greek means fish scales, is a chronic infectious disease which clinical symptoms caused skin and mucosal lesions, and peripheral neuropathy⁹. It was mentioned in the 3rd book of Moses stated that people with leprosy must stay closed for 7 days, and in case of no help, they should let go in torn clothing, bare-headed, and some may cover the mouth shouting "Unclean". According to the Gospel of Matthew, Jesus healed leper^{13, 14}. Leprosy was mentioned in 1200 BC, and it was, also described by Cicero, who lived in the period from 106 to 43 BC. It was transferred from Asia to Europe in the 3rd century BC by Greek soldiers. John's Gospel mentioned St. Lazarus as a protector of leprosy patients, so that the order of the Knights "St. Lazarus" took care of lepers from 1120^{13, 14}.

It was known in the Middle Ages about the leprosy that it was the contagious and incurable disease. It was present during the period from the 11th to the 14th century. Historians of that time described the illness in detail. They stated that the infected had "nodes" like smallpox all over the body, that they were exhausted and apathetic. Leprosy patients experienced the disintegration of their bodies, loss of fingers, nose, which the nation had not met with understanding, but on the contrary with the conviction, and so they were called "unholy" and burned at the bonfire.

Leprosy was considered as hereditary disease. The patients were identifiable by the clothes they were given to distinguish them from healthy people. As they were forbidden to have contact with their own families and people around, they had to carry sticks to be recognized and to touch objects. They wore a bell on it to alert people of their arrival, even to go to a particular side of the road depending on the direction of wind blowing. They were alive sentenced to death and thus suffered not only physical pain, but also a strong psychological pressure, rejected by the society.

Located in so-called "leprosaria", rooms for isolation, with no rights, stigmatized by condemnation of the society because they were sick, they were shure only in their death. During the 13th century, France had over 2,000 leprosaria and there was a home for leprosy patients in Jerusalem^{1, 15, 16}.

Very convincing descriptions of leprosy patients could be seen at the paintings of many artists in the Middle Ages, especially during the Crusades when the highest leprosy spreaded¹³.

Data on leprosy are in the Chilandar code, and the frescoes from the 14th century of monastery Lesnovo give plenty of motives from the period of leprosy epidemic in that period. So, they show Michael the Archangel who blesses the sick of leprosy, Stefan clerk who gives money to the sick and child his (Figure 4), and quarantine for the treatment of the sick^{13, 14}.

In medieval Serbia, king Milutin was serving for the leprosy, along with other patients suffering from skin diseases. In London there was a very old hospital for leprosy patients treatment dedicated to St. James^{7, 17}.

The cause of leprosy was found in 1873 by the Norwegian scientist Gerhard Armauer Hansen (Figure 5), when the disease was called Hansen's disease.

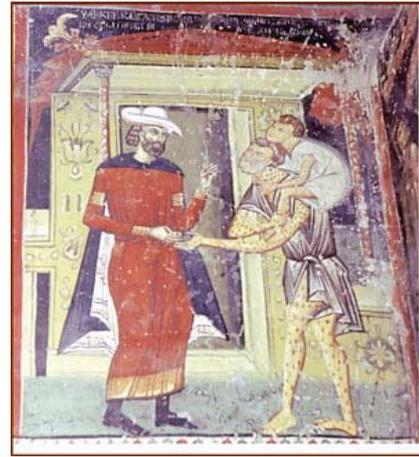


Fig. 4 – A leprosy patient with a child receiving alms (fresco in the Monastery of Lesnovo, Macedonia)

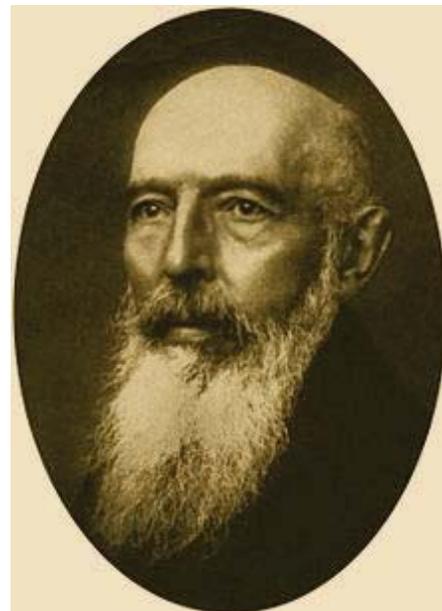


Fig. 5 – Gerhard Armauer Hansen (1841–1912)

Great disaster of the Middle Ages began to wane in the late 14th century. Unfortunately, leprosy as a public health problem exists today because it is still present in some areas of the modern world^{9, 18}.

Conclusion

Historical records of the Old and Middle Ages contain a significant amount of data on the development and movement of infectious diseases at that time. Capture of physicians and historians are of paramount importance for understanding the way that infectious diseases were passed from then to modern times. Plague and leprosy, as one of the most common diseases and largest of the Old and Middle Ages, and the current date, as well as their impact on lives and historical and social trends, constantly remind us of the enormous power carried by infectious disease.

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