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Research Article

Preventive Medicine in Byzantium. A Historical and Retrospective Study

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Abstract

Medicine was impressively developed during Byzantine period (330-1453AC) including social medicine with its practical implications. The aim of this study is to offer a brief description of the pharmaceutical preventive aspects and of the other social preventive measures taken for the safety of the public health during that period. Data used for this study is taken from original manuscripts found in several Libraries and Institutes. In addition, older and modern literature on this subject, both books and articles are reviewed.

A description of the most important pharmaceutical remedies is given with reference to their application in the infectious and non infectious diseases. The non pharmaceutical preventive measures (proper diet, civil program on houses and cemeteries' construction, water supply, drainage and the institution of the sanitary clerk) are also discussed. Finally, a brief mention is made to the saints protectors of public health and preventive medicine.

Keywords: History of medicine; Preventive medicine; Byzantine; Remedies; Medication; Epidemiology

Introduction

A great development on almost all the aspects of Art and Science took place during the Byzantine period (330-1453AC). The Byzantine Empire was multiethnic, having under its authority many Mediterranean European countries, countries of the near and Middle East and of North Africa. Byzantine civilization was inspired by the combination of Christianity, Ancient Greek Philosophy and Roman Justice. The Byzantine Civilization was based on the cooperation of the Civil Authority with the Orthodox Church and the private initiative. The Byzantine Spirit was the founder of the Modern West European Civilization and its influence can be observed even in our times. However, the Byzantine Civilization was also influenced by other Civilizations as well, such as the Chinese, the Persian and the Indian one due to its geographical position close to these countries.

Medicine was impressively developed during that period. The improvement in this field was not only restricted to diagnosis and therapy, but also included social medicine with its practical implications. New social offers and social states were incorporated for the better health quality of the society. Preventive medicine was also developed and some preventive measures were taken regarding the safety of the public health. The importance of preventive medicine was perceived since the early Byzantine Period. There are references to preventive medicine in the books of St Basel (4th century AC). Preventive pharmacology along with general pharmacology consists of two fields that greatly progressed during that period.

The aim of this study is to offer a brief description of the pharmaceutical and other (social) preventive measures taken for the safety of the public health during the Byzantine period. In addition, this study could be used as a source of ideas for future therapeutic targets or research approaches of modern medicine.

Materials and Methods

Data used for this study are taken from original manuscripts found in several Libraries and Institutes. In detail, the original manuscripts were found in the Department of Manuscripts of the National Library of Athens, Genadius Library (Athens), Library of the Holy Synod (Athens), Oxford Bodleian Library, Wellcome Institute of the History of Medicine (London), British Museum Library, Cambridge University Library, Biblioteque Nationale de Paris. Furthermore, older and modern literature on this subject was reviewed, derived from books and articles. Below we critically refer to the most important preventive pharmaceutical agents and the other preventive measures, with a short comment when needed.

Preventive Medicine

Preventive medicine is the medical aspect that, according to the American College of Preventive Medicine, aims to protect, promote, and maintain health and well being and to prevent disease, disability and death. During the Byzantine period preventing medicine was aiming to prevent mainly the epidemics or restrict them, after they had spread. Infectious diseases of the time included plague, rabies, leprosy, cholera, dysentery, tertian and quartan fever, smallpox and tetanus [1]. As it is well known, epidemics were a major threat during these centuries, with a high incidence of morbidity and

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mortality among the population, considered as a major medical and social problem. Several Byzantine writers as Aetious [2], Nikiforos Vlemmidis [3], John Damaskinos [4], Michael Pselos [5], Adamantios, Theophanes Nonos, Symeon Sith, St Basil, John Actuarious [6] and Nikolaos Mirepsous [7], consider the air or some kind of wind, and especially the polluted air, as the main cause of the epidemics and of transmission of the infection. Other parameters that are responsible according to Byzantine physicians, are postulated to be spoiled food, polluted water and the fumes of sinks and marshes. Kaisarios [8], a famous physician, and mathematician, considers dust, smoke and several fumes as major sources of spreading epidemics. According to Nonos [9] marshes are responsible for the infectious fever.

To reduce the risk of spread of epidemics byzantine doctors proposed a proper diet and a healthy way of living including physical exercise. They also used pharmaceutical remedies when needed and proposed a series of practical measures where possible. The most valuable practical measure was the drying of the marshes. The usefulness of a proper diet was supported by several physicians of the time.

Symeon Sith [10], recommended a diet rich in plant-derived fibers, based on lettuce and other vegetables, which is similar to what is considered to be healthy today. The same physician recommended fumigation with incense in case of infectious diseases in order to refresh the polluted air.

Among others, Oribasius [11] and Alexander Trallianos [12] recommended proper diet both for preventing and curing septic fever. The later author also recommended phlebotomy for curing.

Sanitarian aspects of the civil program for construction of houses, water supply, drainage and cemeteries

The Byzantine State, in cooperation with the authorized doctors, applied specific laws concerning house construction. Houses were built under certain healthy precautions. The specific details for the construction of the houses were under the responsibility of the State [13]. The main concern was to avoid infections, stench or air pollution. The minimum distance between the houses had to be 12 feet. The height of the houses and the number of the doors were under control as well. The design of water supply and of the sewage was defined in such a way that the formation of stationary water was avoided. It was also forbidden to throw dirty water or any waste to those living at a lower level.

One of the main health aspects of that time was considered to be the water supply. They were searching for "transparent, healthy, drinkable water" and they were checking carefully of the quality and the quantity of the water in the place where they were going to construct settlements. They constructed wells, tanks and headwaters for drinkable water. The water supply was not free for the citizens. The civil clerk responsible for the collection of the relevant taxes was named "κόμης των υδάτων" which means "The count of water". He was a kind of sanitary employee. According to the law Vasilika and Pandektes [14], the minimum distance between a well and a sink had to be equal to the depth of the sink which is according to "exavivlos" of Armenopoulos 6 inch and 2°. According to Aetious [15], the marshy and generally stationary water was unsuitable for drinking. The same writer proposed for the construction of a bath that it should be in such a way that the water would flow down from the wall in order to produce steam. It is worth mentioning that inside the special clinics where lepers were treated, they had constructed baths for the better washing of the lepers.

Since the early Byzantine Centuries there was special care for the creation of burring places. Since the 4th century the burring of the dead people, was established, according to the Christian Faith. In the same way, the burring places were called cemeteries (cemetery originates from the Greek word kemetirion which means "sleeping place" as for the Christians death is considered to be sleeping). During the early Byzantine Centuries the cemeteries were outside the cities in order to avoid pollution (3rd - 7th centuries). The laws of Theodosius the 1st (379-395) and Ioustinianos (527-565) were in accordance to the Roman law and a fine was applied to the offenders. The first law that permitted the burring of people inside the cities is the one of Leon the 6th the "Wise" in the 10th century.

The institution of the sanitary clerk

This was a pioneer institution of the Byzantine State among the other general preventive measures concerning the safety of the public health. It was first established by the Emperor Leon the 6th the "Wise" in the 9th century. His mission was to record, concern and protect the public cesspools and sewers. His salary was 12 coins. He was chosen from the Prefect of the area and was under his command.

Another sanitary clerk was the so called "κόμης των υδάτων", "The count of water" that was referred above.

Pharmaceutical medication for the prevention of infectious and non infectious diseases

Examples of infectious diseases that are well known during the Byzantine are Black Death, Rabies, Leprosy "Elephantiasi" (from the Greek word "ελέφαντας" for elephant), cholera, dysentery, quartan and tertian fever, smallpox-variolla and tetanus. Therapeutic medication was used against all of them. Apart from the theoretical approach, the Byzantines had developed the aspect of immunology, creating a variety of antibodies and vaccinations against infectious diseases and against the poison of some animals. They had realized that the mechanism for the production of the human antibodies is promoted by entering inside the body, small quantities of the respective antigen or the poison.

Aetious [16] and Paul of Aegina [17], recommended putting the head or the whole body of the snake or the scorpion to the wound in order to stop the deleterious effect of the bite. Aetious also recommended eating the cooked snake or the infusion of the molten shrew in the nostrils, for the same reason.

Aetious recommended in epidemics several mixtures per os, consisting of litharge, ammoniac incense, copper, magnetic stone, fat from ostrich, vine- branch, stomach grass and carbonic herb.

Michael Pselos [18] was very ambitious and recommended jasper stone that is postulated to protect against epidemics in general. Oribasious [19] recommended several medication against not only epidemics, but also against septic conditions in general, including wax, pitch, colophony, calcium, wine, and fat of bull.

Paul of Aegina [20] also recommended several medication that apply both as preventing measures for epidemics and for the therapy of hepatosplenic syndrome.

It is also worth mentioning that the term "preventive medicine" refers not only to the preventive measures against infectious diseases, but also to any other type of diseases including malignancies.

Several Byzantine Writers like Aetious, St Basil, John Damaskinos, Nikolaos Mirepsos, Paul of Aigina and John Actuarious, insist on the importance of reinforce of the human chemical defense mechanisms by prescribing several medication that most of them are based on several herbals and generally physical products. Especially Nikolaos Mirepsos [21] appears very ambitious trying to perform immunity against all type of diseases for life time. The most important medication he was using was named "oksiporion" and "drosaton". There were two types of "oksiporion". The first one was originally introduced by Aetious [22] and was consisting of quince, bulb, fern and hop. It was postulated that his protection was referring against the diseases caused by the so called "depressing juice", like cancer and depression. The second one was a mixture of palm tree substances, ginger, pepper, cumin, parsley, bulb, rue, honey and vinegar, and was offered for protection against liver diseases and especially jaundice.

"Drosaton" was made of a mixture of several pharmaceutical plant substances after boiling treatment. It was using per os for protection against any malignancy that was caused by the so called "jealous juice".

Aetious [23] recommended strong medication for both therapy and prevention of neoplastic and several other infectious diseases. These medication were suitable for using per os (breast cancer), for endocervical use (endometrial carcinoma), per rectum or through the epidermis and were referred to have excellent results. The most

important were "theriaki" "mythridatios" and one called "through the blood". The last one was consisting of hot blood of some animals like goose or duck. All of them considered originally to be poisonous remedies that were used in a positive way (for treatment or prevention and not for causing harm). They were consisting of a mixture of several plants, mammalian and chemical substances. In more detail "theriaki" was introduced by Andromahos and was consisting of squile, pepper, rose, garlic, lily, mushroom, cinnamon, balsa mine, myrrh, saffron, ginger, rhubarb, parsley, incense, amaranth, rush, blood from duck, and boiled honey from Attica. "Mithridatios" was originally named after Mithridate, the famous king of Black Sea, who was using poison in tiny quantities to his food in order to avoid poisonous death by his enemies. There were two types of "Mithridatios", the first one consisting of wormwood, vine - branch, cinnamon, saffron, anise, tinder, castoreum, vineyard, ivy, rose oil, snakeroot, vermilion, gall of bull, valerian and Attica honey and the second one consisting of fragrant gum, balsam tree, asphalt, tear of Arabic tree, melilot, aromatic resin, ammoniac salt, opium, niter, lead, wine and Attica honey. Aetious also recommended for breast cancer, a kind of soup that was a mixture of river crabs and donkey milk.

John Actuarious recommended in malignancies a mixture of ox tongue, sandalwood, cinnamon, clove, Armenian clay and gum of Indian tree. He postulates that his remedy relieves from the influence of the so called "bad gall". Finally, Grigorios of Nazianzos uses a laxative called "αλετιον" that is a mixture of hyssop, (a kind of aromatic herb), mint and ammonia salt, for the prevention of psychiatric disease.

Saints protectors of the public health and preventive medicine

Finally we will refer to the Saints, protectors of the public health and preventive medicine according to the Byzantine Faith. The establishment of those Saints had the origin from the faith that God cooperates with human for the good of the mankind.

The Saints-protectors were usually physicians although some of them were not. Protector of the public health was considered to be Kaisarios who was a physician, a mathematician and a sanitarian of his time. This was due to his reference of the pollution of the atmosphere due to the human factor. Protector of the preventive medicine and public social health care is considered to be St Basel [24]. He studied the preventive measures against the epidemics and he postulated that the direction of the wind is responsible for the pattern of the transmission of the epidemics. He founded "Vasilias" a famous Charity Hospital and treated patients and other poor people for free. Protector Saints against the epidemics are considered to be St Charalampos and St Christophoros. The first one, is considering to stop the epidemics as is historically based, while the second one is the protector against the epidemics over children. St Gregorios is considered to be the protector of the Psychiatry due to his remedy for the prevention of psychiatric disease. Finally, we could mention that St Marina-Margarita is considered to stop the birth of handicapped children.

Conclusion

All the above described pharmaceutical and non pharmaceutical efforts to stop the epidemics or to make human immune persistent against malignances may appear strange to the modern researcher, but they still remain valuable for two reasons.

The first one is that somebody can be impressed by the several different remedies, which in some cases were successful indeed. By a quick glance we can conclude that the spectrum of the substances used was relatively narrow, with most mixtures created by several physicians, consisting of approximately the same substances in different quantities. But it is really interesting that lacking the technological improvement and the scientific progress of the modern times, they succeeded to create so effective remedies.

The second and most important reason is that modern research can probably be benefited from Byzantine remedies, by collecting ideas about natural substances, still unproven to be valuable, that can become after some treatment, the source of production of effective pharmaceutical agents. As it has been stated, the good physician is the one who has good knowledge of both the present AND the past and can predict the future.

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