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THE USE OF PHYTOTHERAPY FOR ACUTE CORONARY SYNDROME IN ANCIENT ROME

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ABSTRACT

Thesis statement: Comparative perspectives about treatment of acute coronary syndrome arising from the study of cardiology across time and space enrich and challenge our perspectives about the treatment of coronary artery disease. Methodology: Historiography and conceptual analysis of the writings of modern and ancient physicians, inscriptions, pictorial sources, coins, and archaeological discoveries. Results: Ancient and modern physicians employ a similar protocol involving subjective information from the patient, objective findings of the examining physician, assessment of the patient's condition and treatment options. However, modern physicians have diagnostic techniques and treatment options unavailable to ancient physicians. Conclusion and Implications: The past is prologue to the future. Comparative perspectives about treatment of acute coronary syndrome arising from the study of cardiology across time and space enrich and challenge our perspectives about the treatment of coronary artery disease.

KEYWORDS: Acute coronary syndrome, myocardial infarction, Roman colonies.

INTRODUCTION

Cardiology is the study of the physiology and pathology of the heart.[1] Acute coronary syndrome (ACS) is a general category that includes acute ischemia of the myocardium with unstable angina pectoris. This can progress to myocardial infarction (MI) (heart attack) which is a common cause of death due to coronary heart disease. Increasing age is directly related to arteriolosclerosis, which is a thickening of the walls of the arterioles, with a loss of elasticity and contractility. The subsequent narrowing of the coronary arteries and resultant insufficient blood flow to the heart is a precursor to ACS. MI is caused by partial or complete occlusion of one or more of the coronary arteries. A heart attack occurs when a blood clot blocks the flow of blood through one or more of the blood vessels that feed the heart muscle.[2] The thesis of this paper is that comparative perspectives about acute coronary syndrome arising from the study of emergency treatments across time and space enrich and challenge our perspectives about the treatment of cardiovascular diseases

This study focuses upon medical techniques of Roman Physicians (medici) because they incorporated into their practice and expanded upon knowledge gained from centers of medical learning in Egypt and Greece. Greece became a province of the Roman Republic in 146 B.C. and Egypt became a province of the Roman Empire in 30 B.C. The Roman army benefitted most because the army was a vital force which created and maintained the empire. Roman physicians and modern physicians used the same protocol in addressing coronary artery disease. The plan consists of acquiring subjective data from the patient if conscious, the findings of the physician upon examination, assessment and diagnosis, and formulation of a treatment plan.[3]

The key question addressed in this study is whether or not cardiovascular care for veterans in the Roman empire was effective or ineffective. Few active duty soldiers suffered ACS because they were young and healthy. Vegetius points out that the Roman military commanders accepted only the healthiest Roman citizens for induction into the Roman army.[4] In addition, the basic and advanced training for service in the legions was severe, and impossible for a young recruit with any form of heart disease to complete.[5] However, upon completion of twenty years or more of active military service, retired Roman legionnaires (emeriti) received financial benefits from the Roman State and free plots of land in Italy or Roman conquered lands. These lands were known as colonies (coloniae).[6] The colonies contained all of the amenities of a Roman town, including private homes, government buildings, public baths, temples, stadiums, markets and hospitals or clinics.[7] Soldiers and their wives could grow old in these colonies and become vulnerable to age-related diseases such as osteoarthritis and ACS.

PRIMARY SOURCES

Aulus Cornelius Celsus (first century A.D.) wrote a study of medical techniques and medicines, Pedanius Dioscorides (A.D. 40-80) compiled an extensive list of drugs and other materials used in medicine. Claudius Galen (A.D, 129-205) developed a systematic approach to medical procedures, and Paulus AEgineta (625-690) wrote a medical encyclopedia, in seven Books. Flavius Renatus Vegetius (4th century A.D.) wrote a chapter on desirable physical conditioning and mental acuity.[8]

METHODOLOGY

The available historical and archaeological materials do not permit a statistical empirical approach to the topic of Roman treatment of ACS. Therefore, the research design of this study employs a combination of historiography and conceptual analysis of the primary sources in their translated editions and in the original Latin. Historiography is an approach based on the concept that historical knowledge provides a basis and rationale for valid knowledge about human activities and achievements. Conceptual analysis is based on careful analytical evaluation of ancient literary sources, inscriptions, pictorial sources, coins, and archaeological discoveries.

ROMAN COLONIES

Upon completion of twenty or more years of active military service Roman legionnaires received veterans' benefits from the Roman State. These benefits averaged 12,000 sesterces in severance pay and plots of land in Italy or Roman conquered lands in territories known as colonies (coloniae). Elite soldiers and officers received higher severance pays. Members of the Praetorian Guard got 20,000 sesterces after 16 years of service.[9] In order to pay for the pensioning of veterans and upkeep of the military establishment Emperor Augustus formed an Army Treasury paid for by taxation.[10]

Veterans built homes and engaged in farming, ranching and other commercial activities. The geographic size and population of the colonies varied. Large colonies had an intramural area of 80-100 hectares compared to a smaller colony with an intramural area of 24-25 hectares.[11] Larger colonies featured greater infrastructure and amenities than the smaller colonies.

The Roman colonies of Augusta Emerita and Metellinum located in the Roman province of Lusitania provide contrasting examples.[12] Augusta Emerita was a large colony with considerable infrastructure including major monuments, bridges, aqueducts, burial areas, suburban houses, street plans, a forum, theatre, amphitheater[13] and probably a general hospital (valetudinarium). Metellinum had most of these features but with its smaller population, urban center and territory the infrastructures there were of a much smaller scale, and there is no evidence of an amphitheater.[14] This colony probably had only a medical clinic (medicinae statione). Medical clinics could render ordinary care for emergencies and short-term illnesses or injuries. Examples are flesh wounds and influenza. Invasive procedures or extensive medical care took place in hospitals.

Examples are traumatic brain injuries and acute coronary syndromes. There were extensive cultural and social links between the two colonies.[15] A colonist from Metellinum requiring specialized or extensive medical care was sent by horse- drawn carriages to the hospital at Augusta Emerita for treatment.[16]

THE ROMAN MEDICAL CORPS

After Gaius Octavian Augustus (63 BC–14 AD) became emperor of Rome, he initiated several changes in the organization of the Roman legions. One of these changes was the development of a Roman Medical Corps and a Veterinarian Corps. Physicians (*medici*) were responsible for setting the physical standards for all men entering military service, maintaining their health while in service, and processing them for discharge or retirement. Military medicine was aimed at the legionnaires. Prevention of disease and injuries was as important as rehabilitation. *Capsarii* (medical corpsmen) rendered advanced first aid to legionnaires as first responders on the battlefield and later assisted health care professionals inside field hospitals. During the Roman Empire, thousands of soldiers suffered from epidemics of communicable diseases. Roman physicians developed techniques for hygiene and sanitation at Roman military hospitals and during normal military activities. Soldiers with contagious diseases were isolated and confined. Physicians developed techniques for pain management and infections that occurred after ancient battles. Roman physicians even developed perioperative anesthetic methods. Wound care employed the use of antiseptics prior to bandaging a wound. Several herbs to manage pain and address fever were also employed. Roman physicians also were able to address stress disorders through pharmacological and non-pharmacological means. The Romans were the first army of antiquity to employ mobile field hospitals, triage, and the hemostatic tourniquet.[17]

The Roman Veterinary Corps was indispensable to the maintenance of healthy horses fit for combat during antiquity. The *Veterinarius Medicus* (Veterinary Corps officer) and his staff were responsible for the treatment of battle wounds inflicted on horses by enemy weapons. The Veterinary Corps also treated complications associated with wounds such as fever, pain, and infection. The Veterinary Corps also treated injuries and sickness in horses to ensure that the cavalry was always fit for expected or unexpected battles.[18]

ROMAN MILITARY HOSPITALS

Roman camps (*castrae*) and forts (*castella*) occupied an area of five to ten acres in addition to the fortified ditches, stockades, and other defensive devices. The average hospital (valetudinarius) occupied an area of

6,000 square feet and could accommodate 250-500 patients. In the event of mass casualties, ward tents could be set up near the hospital. Every hospital had wards, corridors, administrative offices, a dining hall and a drainage system. In addition, there was a surgical suite, lavatories, kitchen, storage cabinets, and baths with hot and cold water. The bath area was also used as an exercise room for physical therapy. Military hospitals had a staff of physicians (*medicus ordinarii*), nurses (*nutrices*), orderlies (*miles medicii*), and specialists. Surgeons and ophthalmologists were among these specialists. The *medicus primus* (chief medical officer) was in charge of the hospital. He reported directly to the *praefectus castrorum* (prefect of the camp). The chief medical officer was assisted by *optio valetudinarius* (hospital executive officer). Convalescent care was under the direction of the *optio convalescentium* (superintendent of convalescence). The duties of this man were similar to a modern physician's assistant. A *seplasiarius* (pharmacist) was responsible for the preparation of medicines ready for administration to patients. The hospital commander was in command of hospital personnel. However, he rarely interfered with the work of specialists except in obvious cases of negligence or malpractice.[19] Campbell's studies demonstrate that hospitals in military forts were better equipped and staffed than the medical clinics in military camps.[20]

MYOCARDIAL INFARCTION

A myocardial infarction (MI) is an emergency situation which involves the death of myocardial cells due to severe ischemia. Roman physicians considered subjective data, objective findings, assessment, and then formulated a treatment plan. This is similar to the process used by modern physicians.

Subjective Data: The patient can experience discomfort and pain in the center of the chest, arms, back, neck, jaw or stomach. Sometimes there is shortness of breath with or without chest discomfort. Breaking out in a cold sweat, nausea and lightheadedness may be present. In some cases, there may be no significant symptoms.

Objective Findings: Modern physicians have specific tests to diagnose a MI. An increase of creatine kinase in the blood is a confirmation of the disease. Ancient, Roman physicians had no precise diagnostic test, electrocardiographs, angiograms, or modern stethoscopes to make a diagnosis. They relied on the patient symptoms, pulse rate, and ear-to-chest to hear heart sounds. However, during the first century A.D. physicians employed a single stethoscope made of bronze. The cylindrical instrument amplified the sound of the heartbeat for one ear only.[21]

Assessment: Prompt diagnosis based on subjective data and objective findings is essential to the survival of a patient.

Treatment: Modern physicians have a myriad of treatments available for myocardial infarction. The use if angioplasty, stints or bypass surgery and electrical cardioversion were options unavailable to the ancient, Roman physicians. Modern drugs such as thrombolytics, antiplatelet agents, nitroglycerin tablets, beta blockers and angiotensin-converting enzymes (ACE), etc. were also unavailable to ancient physicians.[22] The medici relied on opium, Salix alba and ventilation to treat MI. Roman physicians gave patients a draught of opium in wine to control pain.[23] Patients also received the finely powdered bark of the white willow tree (Salix alba) in a draught of wine.[24] Roman physicians placed MI patients in a private area of the hospital assured of circulation of fresh air, or circulated air by hand fans if necessary.

ACUTE CORONARY SYNDROME

Since this paper focuses primarily on Roman treatment of ACS, it is not possible to detail all modern treatments for this condition. The spectrum of ACS includes ST-segment-elevation myocardial infarction, non-ST-segment-elevation myocardial infarction, and unstable angina. Acute pharmacotherapeutic management of ACS focuses on antiplatelet, anticoagulation, and anti-ischemic therapies. Selection of these agents depends upon patient presentation, the decision for reperfusion and individual considerations for risk-benefit analysis of specific drugs. High density statins are initiated and continued for all patients with ACS. Long-term use of dual antiplatelet therapy (DAPT) lowers the risk of major adverse cardiovascular events after ACS and maintains stent patency in patients who underwent intracoronary stent implantation during percutaneous coronary intervention. In many cases 12 months of DAPT is ideal although some patients may benefit from shorter of longer regimens. Neurohormonal blocking drugs such as b-blockers and inhibitors of the renin-angiotensin aldosterone system also lower the risk of major adverse cardiovascular events and can be initiated prior to the discharge of hospitalized patients.[25]

Roman medici employed non-pharmacological and pharmacological methods to prevent or treat ACS. They did not fully comprehend the cardiovascular system and its diseases but learned over the centuries through trial and error and from Greek and Egyptian writings what practices and medicines best addressed the specific symptoms of heart disease. Non-pharmaceutical interventions included: weight control, exercise, dietary changes, adequate rest, recreation, sleep, and dietary changes. Roman physicians learned that obesity correlated with heart disease and recommended overweight colonists to establish and maintain loss of weight. Exercise programs helped military retirees to increase muscle tone and strength and prevent cardiovascular disease. Walking, running and swimming were common forms of exercise.[26] Rest, recreation and sleep can benefit heart health and overall wellness. After a MI Roman physician recommended a diet which excluded meat, poultry, fish and eggs. The diet also

excluded dairy products, oils and nuts. Recommended foods included: vegetables, legumes, whole grains, fruits, turmeric, ginger, cinnamon, coriander and non-alcoholic beverages.[27]

Pharmacological intervention included: hawthorn, bilberry, red vine leaf and garlic. Hawthorn (Crataegi fructus) contains flavonoids which have hypotensive, coronary and peripheral vasodilating, anti-atherosclerotic and anti-arrhythmic properties.[28] Bilberry (Myrtilli fructus) contains anthocyanosides which improve blood circulation in venous insufficiency and have antiplatelet and anti-atherosclerotic effects.[29] Red Vine Leaf (Vitis vinifera) contains polyphenols which improve symptoms of chronic venous insufficiency, inhibit platelet aggregation and hyaluronidase, and reduce edema.[30] Crushed garlic (Allium sativum) contains alliinase which has antiplatelet and antithrombotic activity.[31]

CONCLUSION

Acute coronary syndrome is a problem which transcends time and space and affects primarily senior citizens. Modern technology and techniques are superior to the technology and techniques used by physicians of antiquity. However, past is prologue. The methods of subjective patient complaints, objective findings of the examining physician, assessment of the patient's medical condition and plan of treatment remain the same. Comparative perspectives about treatment of acute coronary syndrome arising from the study of cardiology across time and space enrich and challenge our perspectives about the treatment of coronary artery disease.

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