Review Article

Ancient Greek medicine before and after Hippocrates: the scientification of medicine

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Abstract

The path of Greek Medicine is lost through the centuries between myth and history. The Greek mythology flourishes with stories about the adventures and life of gods, godesses, heroes and heroins. The purpose of this article is to present the evolution of medicine before and after the era of Hippocrates and to stress the
contribution of Hippocrates in the scientification of medicine. A thorough study of ancient texts of the Greek and Roman literature, revealed that Greek mythology abounds in examples of Gods such as Apollo, semi-gods such as Asclepius and Amphiarau, and creatures such as Centaur Chiron who practiced and taught medicine in pre-historical times in Greece. Hippocrates will be the first to nominate medicine as a science rejecting the influence of Luck and of Gods. In general, the chronological order of the appearance of those figures in Greek mythology depict the course of transformation of Medicine from divine gift to practical art.

Keywords: mythology, medicine, Hippocrates, Ancient Greece.

Introduction

The world of Ancient Greek mythology depicts a series of events which are rather allegorically narrated than totally fictitious. The word “μύθος” (mythos) in Greek is totally different by the word “παραμύθι” (fairy-tale): the second is a compound word of the word “παρά” and the word “μύθος” which literally means “on the side of myth” or alternatively “a story very close to that of myth” (“παρά το μύθον”). During prehistory, what was unable to be explained by reason, was attributed to transcendental entities, which had either a human or animal form. In that way, diseases were thought to be of divine origin and, therefore, their final outcome—either cure or death—was bestowed upon the will of God. The innate inability of the individual as a unit or within the family or the tribe led man to device different means with the superior, invisible deities, giving birth, in that way, to Magic and Ritual.

Medicine in Ancient Greek Mythology

Ancient Greeks believed that Gods sent disease and provoked death, punishing “Үβρις” (hubris) and injustice. All disease could be healed by the process of propitiation of the Gods through sacrifices and other rituals. Only the chosen ones could communicate with the Gods; they were people who were worshiped after their death as deities and were undertaking the task to mediate between the patient and the God for the sake of the first.

The first figure in Ancient Greek mythology connected with Medicine is the healer of Gods “Παιών” (Paeon or Paion)
who treated the wounds of Mars and Ades using various ointments and remedies [1]. His name comes from the word “παίω” which means “heal the disease by a magic hit”, whereas the word “Παίαν” was used to name the military lied of victory, connecting the music and healing properties of Paion. During the classic years, the word Paean became a synonym of Asclepius and, in many cases, he was considered as a deliverer from any evil or calamity [2].

Examining the Dodekatheon, Apollo (Figure 1), the God of Light and Music, was also connected to Medicine; he was considered to be the inventor of the art of «θεραπεύειν» (healing). According to Hesiod [3] Apollo was the son of Zeus and Leto, the son of spiritual Light, of Music, of Poetry and of Vaticination. Apollo is considered to be the god who wards off evil and offers help; different names have been used to describe this property such as: “αλεξίκακος” (aleksikakos) - a Greek word that means the one who prevents evil- “λοίμιος” (limios) - another Greek word for the one who provokes epidemics (“λοιμός”). Other characterizations for Apollo regarding his medical dexterities was “υπερδέξιος” (hyperdeksios)- the one who uses the right hand in order to heal-, “ιατρομάντις” (iatromantis) – the one who is doctor and prophet- and “ιατρός” (iatros) since he is referred by Hippocrates as the first doctor ever. Apollo was worshiped in the Oracle of Delphi by the characterization “λοξίας” (loksias), but also as a healer in various places in Ancient Greece such as Lindos, Tegea, Sparta, Athens, Oropos, Sicyon and Thraca in various oracles. Other characterizations for Apollo include “ακέσιος”, “ακέστωρ”, “σώτερ”, “αποτρόπαιος”, and “επικούριος” (akesios, akestôr, alexikakos, sôtêr, apotropaios, epikourios, iatromantis) [4-6].

Figure 1. Apollo
Another important figure in the Greek mythology connected with Medicine was Centaur Chiron (Figure 2), son of the father of the gods, Cronos, and of a nymph, Philyra [7]. Cheiron lived in Mount Pelion, until his forced expulsion to the forest of Laconia by Lapithae, decents of Lapithes who was son of Apollo and Stilbe. Centaurs was a tribe of half-horse men. Mount Pelion in Ancient times was a desolate region full of caves and impenetrable thickets [8]. Centaur Chiron was considered to be the founder and the first teacher of Medicine [9]; his name “χείρων” originates from the ancient greek word “χείρ” which means hand. Chiron’s name implied that he was "skilled with the hands”, and, therefore, could heal by the use of magic through his hands. The name was also closely associated in myth with “χειρουργός» (kheirourgos or surgeon). Except from Medicine, Chiron was an adept in the use of herbs [10-11], the augural art, music, astronomy, law, hunting and the art of war ; therefore he was a brilliant teacher. His students were heroes that excelled in battles and in the field of Medicine and many of them participated in the Argonautic campaign with Jason [12-13]. Chiron was “the wild centaur who ruled in the glens of Pelion” who bred “Asclepius, the gentle artificer of freedom-from-pain, that strengthens the limbs, the demi-god that wards off diseases” and the “most just of all centaurs” [14]. He was worshiped in Magnesia, and, according to Propertius, he healed the blindness of Phoenix, whereas he was the one that converted medicine from magic to a practical art of therapeutics [15,16].

Asclepius (Figure 3), the son of the Trikkaian princess Koronis or Arsinoe and of Apollo, was taught the art of Medicine by Chiron [17, 18]. His mother died in labour and was laid out on the pyre to be
consumed, but his father rescued the child, cutting him from her womb, performing the first caesarean section in the history of medicine. There are many theories about the origin of his name. Some believe that he received his name from the fact that he was born with a caesarean section and that the name Asclepius means "to cut open". Others believe that his name “Ἀσκληπιός” comes from the word “Αἰγλή” which means brilliance or “Ασκλῆς”- the name of a king whose eyes were ill and was subsequently healed- and the word “Ἡπίος” which means calm. Asclepius, as a new-born child, was to be sacrificed along with his mother to the vengeance of Gods, and Apollo took him out of the funeral pile the last moment and transferred him to a cave in Mount Pelion where Chiron lived, in order to learn how to treat illnesses that afflict the mortals [19]. According to the myth, Asclepius’ art reached in such a high level that he managed imprudently to raise up from the dead mortals. There were many theories about how Asclepius obtain his power to resurrect the dead. According to Apollodorus, he had received from Athena the blood which had flowed from the veins of Gorgon, and the blood which had flowed from the veins of the right side of her body possessed the power of restoring the dead to life. According to the other tradition, Asclepius on one occasion was shut up in the house of Glaucus, whom he was to cure, and while he was standing absorbed in thought, there came a serpent which twined round the staff, and which he killed. Another serpent then came carrying in its mouth a herb with which it recalled to life the one that had been killed, and Asclepius henceforth made use of the same herb with the same effect upon men. When he was exercising this art upon Glaucus, Zeus killed Asclepius with a flash of lightning, as he feared lest men might
gradually contrive to escape death altogether, or, according to others, because Pluto had complained of Asclepius diminishing the number of the dead too much [19-21]. Asclepius, after his death, was worshipped all over Greece, and many towns claimed the (honor) of his birth. many magnificent temples- over 300- were built in his honor in Cos, Knidos, and Epidaurus, the so-called «Aσκληπεία» Asclepieia, which were, in the same time, the first Hospitals in Ancient Greece. The Asclepieia, offered their services to patients from all over the Greece from the beginning of sixth century B.C. till the advent of Christianity in Greece in the fourth century A.D. All founders of the first schools of Medicine in Knidos, Kos, Cyrenea and Rhodes in Ancient Greece were students of the Asclepieia’s. His marriage with Epione gave him many children; his sons Machaon and Podalirius, were his disciples who propagated his art in the whole Ancient Greece [22]. Machaon moved from Thessaly to Peloponnesus, where he founded Asclepieia with his sons Alexanor, Sphyrus, Nicomachus, Gorgasus and Polemocrates [23, 24]. Podalirius, on the other hand, founded Asclepieia in Karia, in Aegean islands and in Apulia in Italy. Epione gave birth to four daughters, Hygeia, Panacea, Iaso and Akeso. Hygeia was the goddess of good health, whereas in one of the Orphic Hymns, she is also called the wife of Asclepius. Iaso was considered to be the goddess of recovery, Panacea was the “all-healing” goddess of cures and of “πανάκειας” (panaceas), whereas Akeso was the goddess of wound healing and curing of illnesses.

Asclepius sons, Machaon and Podalirius, according to Homer’s Iliad, participated in the siege of Troy as doctors (chief medical officers) attached to the Greek forces from Thessaly and warriors and were brilliant doctors and excellent men. Machaon and Podalirius, thus, were the first doctors who practiced medicine in the battlefield. In Iliad, in the second book, both of them were marshals of the tribes of Trikka, Ithome and Oechalia who dwelt in Thessaly [25]; in that way, they were not only military doctors but also brilliant leaders who fought bravely. The name of Machaon is named 11 times in Iliad, whereas the name of Podalirius appears only one time [26]. Notably, in the fourth book of Iliad, Homer narrates that Menelaus, the king of Sparta, was wounded by an arrow from the bow of Alexander, and Agamemnon, his brother and king of Mycenae, addressed for help to Talthybius, the divine herald. Talthybius,
in turn, called for Machaon who removed the arrow and healed the wound saving Menelaus from death [27]. Podalirius, specialized especially in internal medicine, on the other hand, according to Homer, could heal wounds using a miraculous cure, whereas he was the first to diagnose Ajax’s insanity by the glinting of his eyes and the depression of his spirits [26]. According to Virgil’s Aeneid, he was one of the soldiers hidden in the wooden horse of Troy [28]. The reports on the death of the two brothers differ. According to Quintus Smyrnaeus, Machaon was killed during the siege of Troy by Eryryplus son of Telephus [29], whereas Podalirius married the daughter of King Damethus, after healing her wounds when she fell off her horse [26].

Melampus, son of Amythaon and ruler of Argos, was considered to be a healer and a soothsayer. His name (‘Μελάμπους’) literally means the one who has black foot whereas his father’s name, “Αμύθεος” means the “ineffable” or “unspeakably great”. Melampus practiced a type of primitive psychiatry; according to Herodote, he healed Pritos’ daughters of their madness by the use of helebore [30]. Later, according to Apollodorus, he healed the mania of the women in Messinia, whereas he also treated the sexual incompetence of Iphiclus by the use of iron rust [31].

Amphiaraus, son of Oicles (Oecles) or Apollon and Hypermenstra [32,33], daughter of Thestius, participated in the hunting of the Calydonian boar, which he is said to have deprived of one eye, and also was as one of the Argonauts [34]. Amphiaraus was a descendent of the Melampus on his father’s side and was thought to have acquired the skill of therapeutics and augury from his grandfather. By his participation in the Argonautic campaign, it is our firm belief that Amphiaraus was the first naval doctor. Amphiaraus was a hero of the war of the ‘Seven Against Thebes’; he died during a battle, when he sought to flee from Periclymenus, son of the divine Poseidon [19], who wanted to kill him, but Zeus threw his thunderbolt, and the earth opened to swallow Amphiaraus together with his chariot transforming him into an oracular daimon (spirit) [35]. After his death, he was worshiped and a sanctuary at Oropos, the so-called Amphiaraeion, was built. Amphiaraus was considered to be a healer and a oracle who was associated with divine Asclepius, as result of his relationship with Melampus. After making a sacrifice of a few coins, or sometimes a ram, at the temple, a petitioner slept inside
and received a dream detailing the solution to the problem.

Agamede was princess of Elis, daughter of King Augeias and wife of Mulius, and a practitioner of the art of mixing medicinal herbs (the so called pharmakeia). According to Homer, she was acquainted with the healing powers of all the plants that grow upon the earth [36].

**Hippocratic medicine: the transformation of medicine into science**

Medicine during the ‘Classical Period’ in Greece was practiced by physicians, who have been trained by renowned tutors or in medical schools, by medical assistants, by empirical doctors, and by charlatans who employed filters and other magical therapies. During this period, two medical schools dominate in Greece: the Medical School of Knidos, with his main representative Euriphon, and the Medical School of Kos, with his main representative Hippocrates (Figure 4). Physicians of the School of Knidos focused on the detailed recording of symptoms and consider each variation of the manifestation of the disease as a separate clinical entity. On the other hand, Hippocratic medicine emphasized the patient rather than the disease with great attention paid to observing and evaluating the physical findings. In Knidos, diseases are categorized according to the the affected organ, a system resembling the practice in the Mesopotamian lands east of Knidos.

![Figure 4. Hippocrates of Kos.](image)

The Hippocratic corpus represents the first scientific recording of the ancient greek medicine. Consisting of 60 ancient Greek medical works strongly, this collection of books is strongly associated with the physician Hippocrates and his teachings, and although attributed to
Hippocrates, most of them are of unknown authorship. The Hippocratic Corpus contain textbooks, lectures, research, notes and case histories without any particular order. For example Books I and Books III of *Epidemics* contain case reports of which 60% had a fatal outcome [37].

In many parts of the Hippocratic Corpus one can find in parallel empiricism and rationalism, since the writer of the Hippocratic corpus bases medical knowledge not only in theories but also on experience. For example, in *Ancient Medicine*, one of the oldest books of the Hippocratic Corpus, the writer deals with the evolution of human diet and will stress that man chooses his diet based on his experience of the effect that various food exert on human health. The next step in the history of medicine is the separation of diet during health and illness:

“For the art of Medicine would not have been invented at first, nor would it have been made a subject of investigation (for there would have been no need of it), if when men are indisposed, the same food and other articles of regimen which they eat and drink when in good health were proper for them, and if no others were preferable to these. But now necessity itself made medicine to be sought out and discovered by men, since the same things when administered to the sick, which agreed with them when in good health, neither did nor do agree with them….. To such a discovery and investigation what more suitable name could one give than that of Medicine? since it was discovered for the health of man, for his nourishment and safety, as a substitute for that kind of diet by which pains, diseases, and deaths were occasioned.’’ [38]

The writer of *On the Places in Man* states that medicine is art (τέχνη) in order to defend against opponents who claim it produces no better results against disease than chance:

“I think that Medicine has already discovered all its sections and, at the current stage, teaches what is necessary in each cases and when circumstances are favorable. Whoever knows Medicine in this way, nothing is based on luck…..” [39]

In *The Law*, one can read the following:

“Medicine is of all the Arts the most noble; but, not withstanding, owing to the ignorance of those who practice it, and of those who, inconsiderately, form a judgment of them, it is at present far behind all the other arts” [40]

According to the Hippocratic texts, medicine draws conclusions based on facts which are gathered on the basis of patient
interview and thorough patient examination. In that way, based on facts, on observation and on reason, medicine, as recorded in the hippocratic texts, becomes a science.

The writers of the Hippocratic texts agree in rejecting divine and religious causes and remedies of disease in favor of natural mechanisms. For example in the treatise On the Sacred Disease considers that epilepsy has a natural cause and its supposed divine origin is due to men’s inability to explain its peculiar character:

“It is thus with regard to the disease called Sacred: it appears to me to be nowise more divine nor more sacred than other diseases, but has a natural cause from the originates like other affections. Men regard its nature and cause as divine from ignorance and wonder, because it is not at all like to other diseases.” [41].

Finally, another important contribution of the Hippocratic school in Medicine was the formulation of Medical Ethics. The Hippocratic Oath represents a landmark declaration of Medical Ethics with practical and philosophical projections. The writer of On the Physician offers the ideal image – physical and moral- of the doctor, whereas in Precepts one can read about the physician’s conduct. Decorum deals with advice on good manners that a physician must have when visiting patients.

**Conclusion**

In summary, Hippocrates, as depicted through the Hippocratic Corpus, inaugurates the scientific era of medicine. In the years to come, the principles of the Hippocratic School of medicine formed the basis of medical thought and research. In the pre-hippocratic era, Medicine mingled between Myth and history; Greek mythology is full of examples of deities and heroes who possessed the art of healing and practiced primitive forms of medicine during pre-history period in Greece. The practice of medicine from Gods, semi-gods and then from humans and Hippocrates could symbolize the different stages of the rationalization of medical practice in Ancient Greece from the cult of Apollo, Amphiaraus and Asclepius to the practice of medicine from Melampus, Machaon and Podalirius and the use of herbs, surgical operations and various other remedies.

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