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Vaccination of the Ethnic Greeks (Rums) Against Smallpox in the Ottoman Empire: Emmanuel Timonis and Jacobus Pylarinos as Precursors of Edward Jenner

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ABSTRACT

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This historical review examined the onset of the vaccination method during the Ottoman Empire. Inoculation was performed in the regions of Thessaly, Macedonia, and Thrace using folk medicine as a measure against the spread of smallpox/variola infection. Greek physicians Emmanuel Timonis (1669–1720) and Jacobus Pylarinos (1659–1718) as well as several other Ottoman scientists of the Greek or Turkish descent pioneered the use and dissemination of variolation and the development of vaccination before or concurrently with Edward Jenner (1749–1823). During the 19th century in the Adrianople (Edirne) region and much earlier in Constantinople (İstanbul), vaccination programs used to be implemented as evidenced by various certificates distributed at that time. Ottoman vaccination documents from the early 20th century and the letter of Lady Mary Wortley Montagu (1689–1762), dated 1719, have been analyzed, which confirms the extensive use of the vaccination method. Smallpox was the first disease to have been treated with vaccination method. The difference between the Greek and Ottoman physicians and Edward Jenner lies in the fact that while the Greek and Ottoman physicians removed fluid from pustules of an infected person to perform inoculation, Edward Jenner removed fluid from pustules of infected cows, which is why Edward Jenner's method was coined vaccination (derived from the Latin word “vacca” meaning “cow”). Further, Turkish physicians Mustafa Behçet Efendi (1774–1834) and Sanizade Mehmed Atallah Efendi (1771–1826) recommended the variolation method. It thus appears that the Ottomans provided care to all ethnicities of their Empire. Vaccines were initially used against smallpox, but the immunization program was eventually extended to other diseases.

Keywords: Emmanuel Timonis, history of medicine, inoculation, Jacobus Pylarinos, Ottoman Empire, vaccination, variolation

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INTRODUCTION

The British physician Edward Jenner (1749–1823) was the first to systematically apply vaccination against smallpox. However, physicians Emmanuel Timonis (1669–1720) from Chios and Jacob Pylarinos (1659–1718) from Cephalonia are considered to be the pioneers of the inoculation method and had their respective studies published in 1714 in the English Journal *Philosophical Transactions* (1, 2).

In 1713, the Royal Society of London announced the invention of an immunization method against smallpox. The pioneer of this method was physician Emmanuel Timonis from Chios, a Professor at the University of Padua, Italy, who was also a personal physician of Ottoman Sultan Ahmed III (1673–1736). Two years later, another Greek physician, Jacob Pylarinos from Cephalonia, made a similar discovery. He was also the head physician of the Tsar of Russia, Peter the Great (1672–1725). From 1704 to 1707, Jacob Pylarinos worked in Constantinople (İstanbul) and later served as a consul in Venice, after which he continued his work as a doctor in Smyrna (İzmir) until 1718 (3). Both of them studied in Padua and held Venetian passports as they both hailed from the Venetian-occupied territories of Greece (Fig. 1a) (4). During his numerous trips, Pylarinos met a Greek villager in Thessaly who would rub children's hands on an infected sheep wound to induce immunity. “Every September, some old women perform vaccinations (inoculations, scarifications) when the heat subsides,” he mentioned in his work (5, 6).

Lady Mary Wortley Montagu (Fig. 2a) (1689–1762), wife of the English Ambassador of Constantinople, had her 6-year-old son inoculated in 1717 in Adrianople (Edirne) after having been informed of the inoculation method against smallpox by Emmanuel Timonis. While everyone in Turkey saw despair and peril, she discerned glimpses of promise. Variolation was adopted as a general measure for the public health and “the people there considered it as self-evident as we consider water today” (7). The method gradually became popular after it was embraced by the aristocracy and doctors of that time. By the year 1840, a Thracian physician and scholar of the Greek descent born in Adrianople, İstefanaki Bey (Stefanos Karatheodori, 1789–1867) (Fig. 1b), performed the first official variolation in Constantinople (8, 9).

Although there are several references for the inoculation method among the populations of China and India, this historical review studies the origins of the inoculation method in the area of Adrianople and the Ottoman



Figure 1. (a) Emmanouel Timonis and Jacobus Pylarinos, engraving from the front cover of their book “Some account of what is said for inoculating or transplanting the small-pox” With some remarks thereon *rov* Cotton Mather. Boston, 1721 (top-panel). (b) Stefanos Karatheodoris, portrait, lithography by the Hellenic Institute of Venice, by Spyridon Mavrogenis in his work *Bios Konstantinou Karatheodori*, Koromelas Eds, Constantinople, 1868 (bottom-left panel). (c) Tsalikis Pasis Zoiros Alexandros, portrait, Institute for Neohellenic Research/NHRF (bottom-right panel)

Empire in general. In support, Ottoman vaccination documents from the early 20th century have been analyzed and the letter by Lady Mary Montagu has been cited. Smallpox was the first disease to be treated with the vaccination method. Edward Jenner has been widely considered as the primary pioneer of the method, thus neglecting the folk wisdom of the Eastern people as well as the achievements of the Greek physicians and Ottoman Administration. A search in the online databases, such as PubMed/Medline, Scopus, and Google Books, was conducted using “smallpox vaccination,” “Ottoman Empire and vaccination,” and “history of vaccination” as keywords. In addition, follow-up search in Greek and Turkish bibliographies was conducted. Documents on vaccination (Turkish: *Çiçek aşısı*) of the relevant period and Lady Montagu’s letter were also studied.



Figure 2. (a) Lady Mary Wortley Montagu with her son in Constantinople, oil painting by Jean Baptiste Vanmour, 18th century (top-panel, 4 sheets). (b) Lady Montagu, Epistle, 1717 (bottom-left panel). (c) Inoculation tools from the personal collection of the Turkish professor İlder Uzel published in Mercan Burcu xix. yüzyılda Osmanlı’da çiçek salgınları ve çiçek hastalığı ile mücadele. Kırklareli Üniversitesi. Yüksek Lisans Tezi, 2017 (bottom-right panel)

Lady Montagu’s Letter and the Ottoman Vaccination Documents

Lady Montagu’s letter, written in April 1717 in Adrianople to her long-time correspondent Mrs. Frances Hewet, describes her travels, mentioning that she is now in good health and people in Edirne have been vaccinated against smallpox since 1717. Since this practice was extremely successful and widespread in the Ottoman Empire, she revealed that she had her son vaccinated as well (Fig. 2b) (10, 11).

The Ottoman vaccination documents that were researched are of standard forms, include information related to the identity of the concerned individual, and have been classified as proof of public record, *verbatim aşî şehadetnamesi* (proof of vaccination) and the affixed French title *certificat du vaccine* (vaccination certificate). The blank spaces in these documents have been filled in by hand as well as sealed and signed by the clerk-in-charge. The certificates were cut out of a “certificate pad” and contained, on the upper right-hand corner, a printed numbering system *koçan varakası* (certificate sheet) without always having the serial num-

ber imprinted. At the top right-hand corner, there is another numbering system referred to as *aded-i umūmi* (general number). The center of the upper portion of the document is sealed with the *tuğra* (the Sultan’s calligraphically written identification complex), which, in this case, belongs to Abdūlhamid II (1842–1918) and a round ornate jewel on the right with the inscription of the name “el-Muzaffer Daima” (The Perpetual Triumphant). The last vaccination certificate is different from the others with no Emperor’s seal but a writing *Devlet-i Aliyye-i Osmaniyye* (The High Ottoman State). These documents are dated between 1903 and 1913 and traced back to Sofilu-Soufli, Kirk Kilise-Saranta Eklissies/Forty Churches, and Balikesir areas, all demonstrating incidences of family vaccinations (Fig. 3a–c) (12).

The Greek Physicians Pylarinos and Timonis

Meeting in Constantinople, Pylarinos and Timonis developed a strategical method for dealing with smallpox, which was an epidemic scourge at that time. Convinced of the safety and effectiveness of variolation, they published their studies (5).

In order to protect children against smallpox, some women healers of the Ottoman Empire (majorly Greek and Caucasian populations) engrafted fluid from pustules of patients suffering from smallpox and scarified children’s skin, palms, forehead, and cheeks. During the smallpox epidemic in 1707 in Constantinople, a noble lady, mother of four little boys, visited Dr. Jacob Pylarinos. She inquired whether he approved of her taking the boys to women healers, to have scarification performed, and to allow the application of fluid from smallpox pustules in order to protect them against the lethal disease. This noblewoman’s initiative put Pylarinos in a dilemma as an expert answer was expected of him to ease the mother’s worries. Indeed, as he writes in his study published in 1715, the woman healer to which the noble lady planned on taking her children “described sufficiently and extensively about the process, manner, place, time, and details of the vaccination procedure.” He also notes, “after careful consideration, I concluded that the method was not incompatible with logic and nature.” Evidently, he was convinced that it was safe to recommend vaccination to the children, who in the long run showed effective protection against the disease. He indicates that the application of the material on the skin, where the scarification had been performed, “is a completely natural intervention with no trace of bias.” The grafting of smallpox is real, pure, and natural because it is performed with purely natural and visible means. He even compared it to the 18th century notion of disease therapy “of transplantation magnetism, through which it is said that diseases are transmitted from one person to the other” (5, 13).

Pylarinos then collected all the inoculation cases he was monitoring, and in 1715, with the permission of the Holy Inquisition in Venice, he published his study *Nova et tuta Variolas Excitandi per Methodus; Nuper inventa & in usum tracta: Qua rite per acta immunia in posterum praeservantu ab hujus modi contagio corpora*, literally entitled “A new and safe method for treating smallpox through grafting; newly invented and easily applied, keeping the rest of the body successfully unaffected by such an infection.” He adds that he was publicizing his method owing to its promising efficacy as a means of protection against the deadly smallpox. He stated, “We announce a medical practice worthy of being admired



Figure 3. (a) Proofs of family vaccination, Soufli, 1903 (top-panel). (b) Proofs of family vaccination, Saranta Eklissies, 1903 (bottom-left panel). (c) Proofs of family vaccination, Balikeser, 1913 (bottom-right panel)

by the scientific community not only for its invention but also for its effectiveness” (10).

Emmanuel Timonis was the son of a priest from Chios. Most of his family members were clergy or doctors. The poet Lorentz Mavilis (1860–1912) and the painter Georgio da Chirico (1888–1978) were both descendants of his family. He was the Vice-Rector of the University of Padua in 1691 and had completed his PhD from Oxford (11). F.H. Garrison states in the *History of Medicine* that his daughter, Kokona Timoni, was vaccinated by him in 1722 and died much later of smallpox, proving that the vaccination was not effective (14, 15). Emmanuel Timonis went on to publish two scientific papers, “*Istoria variolarum qua per incisionem excitantum*” (History of smallpox cured by incision) in Constantinople in 1715 and “*Tractatus de nova variolas per trasmutationem excitanti method*” (Treatise on the newest findings concerning smallpox grafting through scarification) in Leiden in 1721. Emmanuel Timonis’ works have been translated and published in several languages, including English, Italian, and French (14). It is well known that Timonis performed experiments in Constantinople, Chios, and elsewhere, but the significance, in his case, is that although he studied in Padua and Oxford, the doctor trusted folk medicine and as a result, the British distrusted his method (13, 16). This notion also stands true for Pylarinos.

The two pioneers against smallpox, according to Alivizat, probably met in Smyrna (17). Pylarinos in the “Introduction” raises the issue of trust in folk medicine and practical healers, emphasizing the perspective that what some considered being magic and empirically perpetuated had a medical basis. Nevertheless, the methodical science of medicine was required to record and systematize these empirical practices in order to prove which of the practices were right and wrong. He seemed to believe that medicine should not be prejudiced against empiricism as scientists in the Western Europe believed, but rather it should examine all cases to identify what concept lies behind the “magic.” Perhaps because there was no Holy Inquisition in the East, people exercised these practices more freely. For example, he mentions the case of a woman making the vaccine herself while trying to convince his reader on the practicality of this method where the doctor was called upon to observe and experiment with. In general, we could say that the Greeks, being Easterners, appeared more amenable to practical medicine than the Westerners. Although they were uneducated, laymen are crucial in guiding unbiased scientists who can examine and codify the data as he did in the multitude of exemplary incidences he described. In the first part, he describes the method they followed, symptoms of the vaccination, and outcome. In the second part, he presented his own experiments as well as those of Timonis’ as practices that they noticed were used by the people of the Empire. The description of their experiments revealed how a scientist functions through observation in order to arrive at safe outcomes and by not concealing even a single case in which the vaccination resulted in poor outcomes. He did not consider his method a panacea, but he did believe that everyone must be vaccinated, especially children (18, 19).

The detailed juxtaposition of both Timonis’ and Pylarinos’ experiments provides a prominence to their excellent collaboration without any trace of antagonism. They seek not only to benefit the local people but also the entire world, considering that they published their results in the West. Pylarinos’ scientific methodology was also demonstrated in the last part of his study “Aetiologia,” where he used logic as a guide to draw conclusions from his experiments, thereby enabling the possible treatment of the disease (18, 19). For some people, Pylarinos is the first immunologist of the modern world (20).

A French book published in Paris in the year 1756 entitled *Recueil de pieces concernant l'inoculation de la petite vérole, et propres à en prouver la securité et l'utilité* (A collection of documents concerning the inoculation of smallpox and proof of its safety and usefulness) reports, on page 9, that Aubry de la Mortaye, a French cosmopolitan traveler who visited his friend Timonis, mentions his technique. In the next chapter, he says that Timonis learned this technique from a healer in Filippoupoli, who in turn had learned it from her ancestors. The healer’s instructions included the use of a laxative and abstaining from meat, eggs, and wine for 5–6 days before vaccination. Timonis learned of another method recommended by a healer in Thessaloniki, who scarified the skin in the shape of a cross, possibly for religious reasons. Elsewhere, he refers to the letter written by Timonis to the Royal Society of London as well as to Mr. Skragenstierna, the royal head doctor of the Swedish King. In this letter, Timonis describes a method of drawing a blend of

smallpox pus mixed with blood. For vaccination, he selected children who were ill, and on the 12th or 13th day of the appearance of the rash, he pierced the pustules mainly in the feet of the children using a needle. He describes his technique in detail and concludes that in his eight years of practicing it, he was pleased with his success (21). However, it still remains uncertain where Timonis first encountered this method against smallpox, despite the multitude of geographical references available.

From Britain to the World

The method adopted by the Ottoman citizens, published by two doctors for information of the European medical community, was brought to Europe by Lady Mary Wortley Montagu, a poet and wife of the English Ambassador of Constantinople, Edward Wortley Montagu (1678–1761), who served as the Ambassador from 1716 to 1717. When she was informed about the vaccination procedures against smallpox by the physician Emmanuel Timonis, who had been practicing since 1701, she had her 6-year-old son vaccinated (22). Through a letter sent in 1717 from Adrianople, she helped to forward the application of inoculation in England as well. She had several scars on her face and had lost her brother to smallpox. Lady Montagu, who happened to be in England in 1721 during the smallpox epidemic, had her 2 and a half-year-old daughter vaccinated against the disease. According to the *Oxford Dictionary of National Biography*, “the practice of inoculating children spread rapidly among those who knew Lady Mary and who had already been bereaved by the disease. Lady Mary’s most important activity during the 1720s, for the world if not for herself, was the introduction of inoculation against smallpox to Western medicine” (11, 23). The inoculation method, which was already used by Timonis and Pylarinos, soon gained popularity and was practiced by several physicians in Europe. In 1721, the famous American surgeon Zabdiel Boylston (1679–1766), who recognized the importance of the work of the two Greek physicians, began the application of the inoculation method in Boston (4, 24). The Genevan physician Théodore Tronchin (1709–1781), after studying in Cambridge University, introduced the inoculation method in Switzerland, praising the two Greek pioneers in his writings (25).

J. Crawford, a British physician, mentioned that the inoculation method was introduced by both Timonis and Pylarinos. Although he suggested that all physicians should experiment with the inoculation method for smallpox, he also proposed the idea that Pylarinos had exaggerated the success ratio. As the variolation results in Britain showed lower success, Crawford believed that Pylarinos mostly noted rather than practiced the suggested method (26). Some researchers also believe that the Turkish population as well as the Turkish Administration of the Ottoman Empire neglected to take measures against epidemics at least until the 19th century. However, the citizens of Turkish origin had sporadically used the inoculation technique, especially in the regions where Greek and Circassians resided while the Greek physicians were employed by the Empire (22, 27). Moreover, it is believed that young women recruited from Caucasian villages to become spouses of the Sultan likely promoted this practice and that the Sultan himself recognized the scars on their body and encouraged promotion of the method (22).

It seems that the first case of smallpox inoculation was performed in Thessaly (16th century), a region in the middle of the Hellenic peninsula, and later in Macedonia as a folk method against infection (28). Based on the observations of Timonis and Pylarinos, the said method was introduced in England, where deaths from smallpox averaged roughly 10%–20% in the affected regions (29). The publication of the two Hellenic papers in the same volume of *Philosophical Transactions* supports the view of the possible collaboration of the two physicians. Meanwhile, both the works were republished in a common volume in Leiden in 1721 after the deaths of both the authors (30, 31). A few years later, the method was embraced by the Greek population, both in the Hellenic peninsula and the islands (first adopted in the Ionian island complex of Heptanesa) as well as in the Asian parts then belonging to the Ottoman Empire. This fact was sealed by the recommendation of the Christian Orthodox Patriarch who cherished the method and proposed it to all the Greeks (32).

Was it the French?

Pylarinos and Timonis were considered as Edward Jenner's precursors (30, 31). Jenner was the one who introduced the term "vaccination," which was later accepted by the great French microbiologist Louis Pasteur (1822–1895) (29). However, it seems that both of them adopted the method of the Greek and Ottoman physicians, who made critical contributions to the major achievements of vaccination through bibliography and international conferences (33).

At several times in the history, breakthroughs in medicine were attributed to only one person. Thus, Edward Jenner has paradoxically remained in the history as the first physician to have had systematically applied the vaccination method against smallpox, even after 80 years of its actual introduction. Jenner used pustules collected from infected cows (variola vs. vaccination) (34). Thus, the difference between the Greek and Ottoman physicians and Edward Jenner lies in the fact that while the Greek and Ottoman physicians used pustules collected from an infected person in order to achieve immunization, Edward Jenner used pustules collected from infected cows, which explains why his method is termed as "vaccination" (derived from the Latin word "vacca" meaning cow) (5, 8, 9). However, the initial scientific application of the term "vaccination" in the European territory should be attributed to the observational spirit of the Greek physicians Pylarinos and Timonis as well as the Ottoman citizens and Ottoman State authorities. The Ottomans always employed Greek physicians in their service, recognizing their significance but also applied the folk inoculation method, which was being practiced among the Rums (35).

At this time point, we should mention the Ottomans' leadership in preventive medicine and that the vaccination program included citizens of the Ottoman Empire from all categories. Because epidemics affected the entire area, the Sultans sent their physicians, mostly Greeks, to various conferences in the West and favored application of epidemic-containment methods (8). It is therefore important to note that during 19th and 20th centuries, the vaccination programs were also applied for other diseases, such as rabies (1882), plague, cholera (1883), dysentery, diphtheria (1900), and typhoid fever (1915) (8, 13). It was decided in 1840 that all those applying to the Imperial School of Medicine (Mekteb-i Tibbiye-i Ad-

liye-i Şahane) should be vaccinated and two officials, under the title of "vaccinationist," headed by Dr. Isthefanaki Bey Karatheodori, were accordingly appointed (36).

The Ottomans

Since the early 15th century, a method of variolation through the nostrils was recorded in China. However, the first Western physician to provide an accurate description of smallpox was Ahrun (610–641), a Greek-speaking Christian Egyptian, who lived in the city of Alexandria. In the 10th century, the best and earliest description of smallpox and its differential diagnosis from measles was provided by one of the most notable physicians and polymath Abu Bakr Muhammad ibn-Zakariyya al-Razi (854–925). Shortly afterwards, reports appeared of the described cutaneous variolation in various regions of the Ottoman Empire (37). A Christian inoculator, Ali Chelepi, widely used this method in Adrianople around the year 1657, including that on his son (38). In 1712, physician Edward Tarry of Enfield, who had returned to England from Pera and Galata, claimed that he had observed more than 4000 cases of variolated Ottoman citizens. In 1715, Peter Kennedy, a Scottish ophthalmic surgeon who had visited Constantinople, also published his observations of variolation or, in his words, "engrafting the smallpox," in a book titled *An Essay on External Remedies*. On March 7, 1716, the botanist William Sherard (1659–1728), British Consul at Smyrna, and a close friend of Pylarinos, sent a letter and printed pamphlet published by Pylarinos to his brother James Sherard (1666–1738), an apothecary and a Fellow in the Royal Society. It seems that Pylarinos had undertaken, or at least observed, a series of three successful inoculations in or around the year 1701. Moreover, Sherard's letter stated that two sons of John Hefferman, the Secretary to Sir Robert Sutton (1671–1746), the British Ambassador to Turkey, had been variolated in Constantinople (39). Moreover, Timonis himself praised the Ottomans for their use of the said method, which according to his opinion, had been adopted from the populations of the deeper Asian continent and had been in use since at least past 40 years before his publication (32).

There were four manuscripts published in the early 20th century that mentioned inoculation prior to the 18th century in the Ottoman Empire. They all refer to a mystery man who came to Constantinople and variolated some children. It may have been Ali Chelepi. One more manuscript of the late 18th century mentioned a female inoculator who inoculated 50 or 60 children in Adrianople. Although all these events happened in the lands of the Ottoman Empire, it seems that due to the fact that most of these physicians were Christians in majority of the populations using the inoculation method, the scientific discussion became more Eurocentric and as a result, the Oriental innovations were somehow sidelined (38).

The Ottoman leadership in the field of vaccination was further demonstrated by the historical creation of the first bacteriological center in the Eurasian region. On his return from Paris, Zoiros Alexandros Tsalikis Pasha (1841–1917) (Fig. 1c) brought with him two hares that had been infected the day before along with all the equipment required to establish a bacteriology laboratory. Upon his return to the Empire on December 29, 1886, he wrote a report to the Sultan (cited in Yıldız Palace archives, file 25) and immediately set up the bacteriology laboratory as well as



Figure 4. (a) Mustafa Behçet Efendi, portrait, engraving of the 19th century (left panel). (b) Sanizade Mehmet Ataulah Efendi, colorized engraving, beginning of the 20th century (center). (c) Hekim Ismail Pasa, portrait as published in Turkish journal “Milliyet” in 1986 (right panel)

the production of the vaccine against rabies. Under the direction of Zoiros, the laboratory began operating in his clinic, to be later transferred to Demirkapı on the premises of the old Medical School. Dr. Zoiros Pasha named the operating room “Dersaadette Daülkelp ve Bakteriyoloji Ameliyathanesi.” This was the first institution created in the East for the treatment of rabies. Zoiros Pasha started preparing the vaccine by using materials collected from the two infected hares and transferring the materials by injecting to other hares. Pasteur’s method of preparing the first vaccine against rabies administered to infected people was later announced to the Military Medical School Administration in Constantinople on June 3, 1887 (8). The center of Zoiros Pasha did an enviable job against infections. It has been reported that after the transfer of the laboratories from the garden of the Imperial Medical School to a mansion house in Nisantasi in 1895, 3,750 vaccines against diphtheria were produced in the year 1899–1900. At about the same time, two more institutes of microbiology and preventive medicine began operations, namely the Vaccination Laboratory against smallpox and Imperial Vaccination Center in Constantinople. Between 1892 and 1913, a total of 7,260,784 people were vaccinated (8, 39). Zoiros Pasha was a great admirer of the French microbiologist Louis Pasteur and he represented Turkey in several scientific conferences to share his knowledge of the Ottomans (8).

Considering all these findings together with the concerning issue of vaccination certificates by the Ottoman authorities revealed that these documents contained sufficient details on the identity of the individuals who were vaccinated but the most interesting information was omitted, viz., diseases that were prevented as a result of vaccination. The fact that all other certificates, except for two, are related to only one family may be a strong indication that vaccination in the Evros region had spread to the populations. This observation may also be interpreted as a version of progressive urbanization, since it implies a level of familiarity with all the modern medicines of that time had to contribute to the emerging field of disease prevention (39). The center of all decisions seems to have been Constantinople, where smallpox appeared as early as in the 12th century and also evidenced by Theodore Prodromos’ collection of poems “Ptochoprodromika”

(1115–1160). It seems that both Timonis and Pylarinos applied the variolation in the epidemic that broke out in Constantinople in 1701, following the example of a Greek individual who is said to have used it in 1660. Many scholars believe that Timonis was the first to study it. At first, the Turks rejected the method, but later the Ottoman authorities embraced it and implemented general variolation programs (40–42). Vaccination of the population appears to have been organized and massive, beginning during the Ottoman Empire and culminating in the 19th and 20th centuries (37).

Greek newspapers of the time, both in the Greek territory and in areas of the Ottoman Empire (the Istanbul’s “Postman” and the Macedonian “Thessaloniki”), extensively covered the vaccination programs while physicians of the time had developed the appropriate inoculation tools (Fig. 2c). In addition to physicians of the Greek descent, several Ottoman physicians used the variolation technique, including Mustafa Behçet Efendi (1774–1834) (Fig. 4a) in 1801, who also translated Jenner’s work from Italian to Turkish, Sanizade Mehmed Ataulah Efendi (1771–1826) (Fig. 4b) in 1811, and Hekim Ismail Pasa (1807–1880) (Fig. 4c) in 1845, who arrived from Chios and served as Sultan Abdülmeccid’s chief surgeon and personal physician (8).

Epilogue

The Ottomans provided care to individuals of all ethnicities of the Empire. The vaccines initially concerned smallpox but were later extended to other diseases to acquire a broader character, resulting into family planning. The pioneers appeared to have been the Greek physicians of the Ottoman Empire, whom the Ottoman authorities had the intelligence to employ in their state mechanism. The inoculation method applied through folk medicine by the laymen of the Ottoman Empire led to its scientific discovery. Vaccination is one of the brightest chapters in the history of medical sciences. However, the tendency of the Western medicine to neglect the achievements of Eastern people such as the Greeks and Ottomans is once more observed in the case of vaccination against smallpox. In fact, the lone genius paradigm, as in the case of Edward Jenner, is detrimental to the evolution of a medical breakthrough.

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