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Humanities in health

A case of syphilis in Gustav Klimt's Medicine? Iconodiagnosis and historical review

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ABSTRACT

At the beginning of the XX century, syphilis was a major cause of morbidity and mortality, earning the name "The Great Imitator" due to its complex manifestation. The causative agent of syphilis remained unknown until 1905, when *Treponema pallidum* was identified, followed shortly by the introduction of Salvarsan as the first effective treatment in 1910. The social stigma associated with syphilis compounded its public health challenge, especially in cities like Vienna, where urbanization, poverty, and prostitution fueled its spread. Paleopathological records indicate that congenital syphilis had been present in Vienna since the 18th century, emphasizing its historical persistence. The disease's impact extended beyond health, permeating culture and art. Renowned painters, including Édouard Manet, Paul Gauguin, Vincent van Gogh, and Francisco Goya, are believed to have suffered from syphilis, while others, like Edvard Munch, drew inspiration from it in their work. Gustav Klimt, a pivotal figure of the Vienna Secession, created Medicine, a painting that reflects themes of life, death, and human vulnerability. Klimt's depiction of human forms entwined in a cycle of life is characterized by the presence of death as a skeletal figure. Near death stands a woman with three pathognomonic signs of syphilis: saddle nose, Hutchinson's teeth and alopecia syphilitica. The two figures may symbolically represent the societal burden of syphilis. By capturing the fragility of human existence, Klimt's work may suggest the pervasive influence of the syphilis epidemic on Vienna's cultural and artistic landscape. This interpretation situates Klimt within a broader narrative wherein syphilis shaped artistic expression in an era marked by both scientific discovery and public health challenges. The prevalence of syphilis in early XX-century Vienna may underscore the intersection of disease, art, and culture, making Klimt's Medicine a testament to this complex scenario.

Background and aim

Syphilis is a sexually transmitted infection which could become a chronic systemic disease. It is caused by the spirochaete bacterium *Treponema pallidum*, classified under Spirochaetes phylum, Spirochaetales order, Spirochaetaceae family [1]. Syphilis is spread mainly through sexual contact when the causative agent is transferred into damaged skin or mucous membranes, mainly during sexual intercourses. The disease is characterized by the formation of ulcers and sores and can lead to severe damage to various organs and systems and even death in the forms of tertiary syphilis. Syphilis can also be transmitted vertically from the mother to the newborn [2]. There are various main hypotheses about the origin of syphilis and its impact in the history of medicine is widely accepted [3–7]. It was not until 1905 that Fritz Richard Schaudinn, a German zoologist, and Erich Hoffmann, a dermatologist, discovered Spirochaeta pallida (now called *Treponema pallidum*). The bacterium was spiral-shaped and white under dark background light [1,7,8]. In 1906, August Paul von Wassermann, a German bacteriologist and assistant of Robert Koch, developed a complement-binding serum antibody test for syphilis; the so-called "Wassermann reaction" [9].

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From the mid-nineteenth the incidence declined even in developed countries, except during wars. Nevertheless, there has been a dramatic increase in syphilis cases in recent decades, which has been accompanied by a relative increase in scientific interest in the subject. Moreover, congenital syphilis remains a major public health problem, particularly in low-income countries, complicating an estimated one million pregnancies annually worldwide [1,10–14].

As previously introduced, congenital syphilis is a chronic infection typically caused by transplacental transmission, or less commonly, through direct contact with syphilitic genital lesions during delivery. Transmission can occur at any stage of pregnancy, but the risk of transmission increases as the pregnancy progresses. Congenital syphilis is often referred to as "The great imitator" because of the wide spectrum of clinical manifestation. These infections range from asymptomatic to serious consequences such as stillbirth, growth restriction or prematurity [15]. The known consequences of a mother suffering from syphilis were serious. In the first two decades of the 20th century, there are reports of 12 consecutive abortions before 4 children were born alive but died prematurely due to syphilitic meningitis [16]. Common fetal signs include hepatomegaly, anemia, placentomegaly, polyhydramnios and hydrops. Early symptoms (before two years of age) may include anemia, rash, lymphadenopathy, hepatobiliary problems, feeding problems, failure to thrive and fever. Moreover, syphilitic alopecia is a rare and underreported manifestation [17]. Pathognomonic are moth-eaten bone lesions. Up to 60% of symptomatic newborns may have neurosyphilis with seizures or eye problems [15]. Late congenital syphilis typically manifests after 2 years of life [18]. Late manifestations are a consequence of scarring or chronic inflammation and are characterized by gumma formation. These manifestations include midline facial bone abnormalities, such as saddle nose, and deformities of the lower extremities, like saber shins. Other features include Hutchinson teeth, cutaneous and mucosal rhagades and gummas, sensorineural hearing loss and ocular complications such as interstitial keratitis, secondary glaucoma, corneal scarring and optic atrophy [15,19,20].

In the following essay, we discuss the possible influence of the syphilis "pandemic" on a masterpiece of visual art such as Gustav Klimt's Medicine. Scientific databases (e.g. PubMed and Google Scholar) and historical records have been reviewed. The reader is encouraged to look at the work from the perspective of the artist and the one of the physician; while remarking how a terrible pandemic might have shaped pictorial art almost one century ago.

All authors conducted an analysis of a high-resolution image of the black-and-white photograph "Medicine" by Moriz Nähr (after 1901), owned by and available on the website of the Austrian National Library (https://onb.digital/result/10DEEA8C).

The primary focus of the analysis was the identification of possible pathological lesions; however, postures and facial expressions were also systematically examined. In the absence of specific guidelines, the assessment was conducted according to the authors' clinical expertise, which may provide insights into potential underlying medical conditions.

Subsequently, a cross-analysis of the iconographic observations and historical-medical sources was performed to assess the validity of the diagnostic hypotheses, in accordance with recommended iconodiagnostic practices [21]. In particular, the artwork was evaluated through comparison with parallel representations by the same artist and contextualized within the historical and artistic framework in which it was produced. Contemporary medical knowledge was also taken into account.

The presumed pathological lesions were evaluated by a panel of medical practitioners with specific expertise in the relevant disease area. After formulating a primary diagnostic hypothesis and possible differential diagnoses, a consensus diagnosis was reached among the members of the iconodiagnostic team. Finally, the level of evidence supporting the proposed diagnosis was estimated.

Contextualization: the scourge of syphilis in Vienna and Gustav Klimt

At the beginning of the XX century, Europe was at the forefront of research into venereal diseases [22]. For centuries, they have been treated with topical ointments and with derivatives of mercury. They were administered orally, by injunction, inhalation or injection. These mercury treatments were administered over a long period of time, sometimes for life, which led to the well-known saying "A Night with Venus, a Lifetime with Mercury" [23]. The first chemotherapeutic agent effective against syphilis was Salvarsan (arsphenamine). It was discovered by Paul Ehrlich (1854–1915) in 1910 and it was his 606th tested arsenic compound [24]. Based on the observation that fever leads to a symptomatic improvement in neurosyphilis, various methods of fever induction were also tested (e.g. turpentine, tuberculin and even *Salmonella typhi*). Interestingly, in 1917 the Austrian physician Julis Wagner-Jauregg (1857–1940) included Plasmodium vivax induced infection in the treatment of syphilis [1]. The same treatment, known as malariotherapy, was also used from the late 1920s on the mentally ill population and neurosyphilitic patients [25]. The XX century is often referred to as "the century of sex" and is seen as an era of increasing liberalization; with complexities and contradictions in sexual desires and behaviors [2,26]. Prostitution and sexually transmitted diseases were widespread throughout the European continent in the early XX century [27,28]. Intercourses with female sex workers were encouraged also to treat man's nocturnal ejaculation (onanism) [16]. Moreover, barrier contraception methods (e.g. condoms) were not widely used. As a matter of fact, Charles Goodyear (1800–1860) only discovered the vulcanization process in the second half of the XIX century, while latex was invented after the first two decades of the XX century [29]. Furthermore, the use of contraceptive female pessaries applied to the cervix, such as the Mensinga's or the Matrisalus', did not protect either the man or the woman from the horizontal transmission of bacterial and viral pathogens, including *Treponema pallidum* [30].

In the early XX century, in Vienna, the syphilis epidemic became a major public health problem, exacerbated by factors such as urbanization, poverty and prostitution. The city's medical community responded with public health campaigns and regulations, although the social stigma surrounding syphilis hindered progress. Many infected individuals avoided seeking help for fear of social consequences. Efforts to control the disease also included the regulation of prostitution and medical practices to curb the spread of the disease [31]. Since the first appearance of syphilis in the 16th century, the image of the sinful, dirty and lustful syphilitic person has been created. Today, as then, the stigma accompanies many infectious and non-infectious diseases with severe consequences [32,33].

In 1904, Adolph Schiele, the father of Egon Schiele (1890–1918), died of tertiary syphilis. He had contracted syphilis around the time of his marriage, but refused to admit the disease, did not want to have it treated and soon after infected his wife. Her first 3 pregnancies were stillbirths, while Elvira, the first surviving child, probably died at the age of 10 from meningitis, a complication of late-onset congenital syphilis. Egon was the first boy to survive and become a major figure in Austrian Expressionism, a modernist movement that arose in Vienna about 1909–1910 [34]. Schiele's mentor and friend was Gustav Klimt (1862–1918), a milestone of the Vienna Secession depicted in Fig. 1. The Secession was a movement closely related to Art Nouveau that was formed in 1897 by a group of Austrian painters [35]. Interestingly, recent movies depicted the same Klimt as a patient in hospital using mercury treatments for a syphilis which he had contracted earlier in his life (e.g. Klimt by Raúl Ruiz; 2006; 2 h 11 min) [36].

"Medicine" by Gustav Klimt

"Medicine" is an oil on canvas painted by Gustav Klimt's between 1899 and 1907, and it is a remarkable example of early XX century

Fig. 1. Gustav Klimt im blauen Malerkittel; by Egon Schiele. 1913. Edited by the authors from Wikimedia Commons.

Fig. 2. The original destroyed painting of Klimt's Medicine for the University of Vienna. Image taken from the public domain. Wikimedia Commons.

Symbolism, characterized by its elaborate decorative style. It was one of the three allegories (along with Jurisprudence and Philosophy) commissioned to Klimt in 1894 to decorate the ceiling of the Great Hall at the University of Vienna, and presented in March 1901 at the 10th Secession Exhibition.

The paintings were meant to represent the faculties of the university, highlighting the positive effects of these sciences in society. However, Klimt provided a completely different representation.

The composition of Medicine is centered around Hygeia, the Greek goddess of health, who is depicted with the Aesculapian snake around her right arm, the cup of Lethe in her left hand, both symbols of renewal and medicine. She has an aura of divine grace. Behind her, there is a column of nude figures representing the "river of life", the succession of events of human existence, from creation to the dissolution of life itself. Among these figures, a skeleton symbolizes death.

Beside it, on the left side, a young nude female with a newborn infant at her feet, represents life. The link between this woman and the column of bodies is two arms.

The painting juxtaposes Hygeia's serene and idealized form with a chaotic amalgamation of figures and symbols, simultaneously illustrating the complexity of life and the multifaceted nature of medicine (Fig. 2).

The painting is able to emphasize the tension between the idealistic depiction of health and the reality of human suffering and illness. This dichotomy underlines the painting's thematic exploration of the dual aspects of medicine as art and science [37]. With this painting, Klimt reminds us that the highest aim of medicine is not to achieve immortality, but to relieve suffering, honor human dignity, and preserve love during the physiological human decline [38].

The painting "Medicine", still unfinished at the time, was presented to the public on 15 March 1901 at the tenth exhibition of the Vienna Secession. The work provoked strong criticism within academic circles, as Klimt was accused of failing to depict medical science according to established conventions and to the way physicians themselves understood their discipline [39]. In particular, he was reproached for having offered his ministerial patrons a symbolic and unsettling vision in which the chaotic entanglement of suffering bodies alluded to the conditions of the Vienna General Hospital [40]. Moreover, Klimt was also accused of indecency and pornography because of some of the nude scenes depicted, particularly the pregnant woman in the top right-hand corner [41]. The controversy also involved art historians, who became sharply divided into supporters and opponents of Klimt's work [42].

The resonance of the debate was such that Klimt attempted to terminate his contract with the Ministry; when this proved unsuccessful, he refused to hand over the paintings. Ultimately, the State revoked the commission in exchange for repayment of the fee that had already been disbursed. Subsequently, partly due to financial difficulties, Klimt sold the painting to a private collector; it was later acquired by the Austrian Gallery [43]. In the following years, "Medicine" was exhibited on several occasions. In 1943, together with the other Faculty Paintings, it was transferred to an art storage depot at Immendorf Castle in Lower Austria for protection against wartime damage. There, the works were irreversibly destroyed in a fire on 8 May 1945, which, according to some accounts, was set by German soldiers who reportedly stated that it would have been "a sin" for these artworks to fall into Russian hands [44]. So, the original work was destroyed and only black and white images remain; however, thanks to artificial intelligence, a color version was created [45].

The syphilitic woman in Gustav Klimt's Medicine: Saddle nose, Hutchinson's teeth and Alopecia syphilitica

Artists have secularly been influenced by infectious diseases circulating in their age [46]. In addition, there are many representations of infectious diseases in works of art. In particular, throughout the centuries, sexual transmitted diseases and syphilis have been represented in different ways in Art [47], such as in some paintings by William Hoghart [48] and Edvard Munch [49]; as well as in cinema [50]. Congenital syphilis and syphilitic faces has also been represented in artistic work (e.g. in The Inheritance, 1897–1899, by Edvard Munch) [49,51].

Interestingly, we report that at least three pathognomonic signs of congenital syphilis may be identified in the female figure with a covered body and closed eyes near the skeleton. This figure is generally considered as a representation of the illness, appearing alongside the figure of death, and together with her, symbolizing the ills of humanity plagued by illness and death [38]. It is similar to some figures that Klimt depicted in "Beethoven Frieze". On the central wall, above the Gorgons, there are dark faces representing illness, madness, and death. These faces are toothless and have a broad forehead suggesting alopecia [52].

However, looking at this figure, and considering the limitations due to the black and white picture, we can observe three possible clinical features of congenital syphilis: a saddle nose, Hutchinson's teeth and alopecia (Fig. 3).

Saddle nose deformity is a severe complication of late congenital syphilis and late-stage or tertiary syphilis, characterized by the collapse of the nasal bridge due to destruction of the nasal cartilage and bone. This deformity reflects the progression of untreated syphilis and the cultural and medical challenges surrounding the disease. The development of saddle nose is primarily linked to the formation of gummas, which are destructive granulomatous lesions. These lesions lead to tissue necrosis and scarring, targeting the nasal septum. Over time, the septal cartilage and bone erode, causing the nasal bridge to collapse into a characteristic concave shape, resembling a saddle. Historically, patients with this deformity often sought cosmetic interventions, such as nasal prosthetics, to conceal their disfigurement. The saddle nose deformity serves as a visible reminder of the significant impact of untreated syphilis on both physical appearance and quality of life [18,51,53,54].

Hutchinson's teeth are stigmata of late congenital syphilis and were clearly described by 1863 [55]. Along with interstitial keratitis and hearing loss due to eighth cranial nerve damage, they form the Hutchinson's triad. The upper incisors display a notch and taper from the base toward the free edge. When the notch is minimal, they are referred to as screwdriver-shaped incisors. These teeth are often spaced further apart than normal. Moon molars, also known as mulberry molars, are abnormal molars characterized by clustered cusps on the occlusal surface [56].

Hair loss in syphilis is an unusual manifestation, occurring in approximately 4% of cases. In early syphilis, all types of alopecia can occur, ranging from localized patches to total hair loss [57]. Moreover, early diffuse alopecia has been described also in neonates with congenital syphilis and it has still not been systematically described. [17,58]. Hair loss typically appears later than the cutaneous manifestations of syphiloderm, approximately 8–12 weeks after their onset, at which point serological tests are invariably positive. Hair (and body hair) shedding may follow the distribution of the exanthem. Patients often report diffuse hair loss; however, clinical examination reveals yellowish-reddish alopecic areas that can merge into irregular patterns. This is the most common type of pattern, also called moth-eaten or patchy alopecia. The eyebrows may also be affected. Complete patchy alopecia resembling alopecia areata is rare. In other cases, diffuse shedding may occur, leaving a scalp with a light yellow-reddish hue visible in a widespread telogen effluvium-type hair loss. Mixed pattern characterized by small, irregular plaques of alopecia developing on a background of diffuse alopecia can also occur. Finally area of alopecia can be associated with the typical skin lesions on the scalp, usually in the form of papulosquamous lesions [59].

The marks on the face and body of a syphilitic became the unmistakable sign of a progressive change in the sick person's body, of his gradual estranged decomposition and a clear sign of God's punishment for a licentious life [60].

As syphilis was one of the most important and widespread health problems at the beginning of the 20th century, we can hypothesise that Klimt deliberately included a woman suffering from syphilis among the characters of the "River of Life" in order to depict the partial failure of medical progress and clinical research. As a matter of fact, until the discovery of penicillin, doctors were mere observers of the disease evolution and could only rely on the alleviation of symptoms [8].

Moreover, the author's choice to use a woman's body to depict syphilis was not accidental. In fact, women's sexuality and prostitution were historically associated with syphilis and other venereal diseases. Since the late XVII century, official efforts to contain the disease focused on controlling women and their behaviors, brutally examining them and imposing detention to the suspected or confirmed cases (e.g. the Contagious Diseases Acts introduced in England and Ireland in the 1860s) [61].

Moreover, maybe Klimt deliberately places the figure suffering from syphilis next to the figure symbolizing death to underline the high mortality rate of the disease.

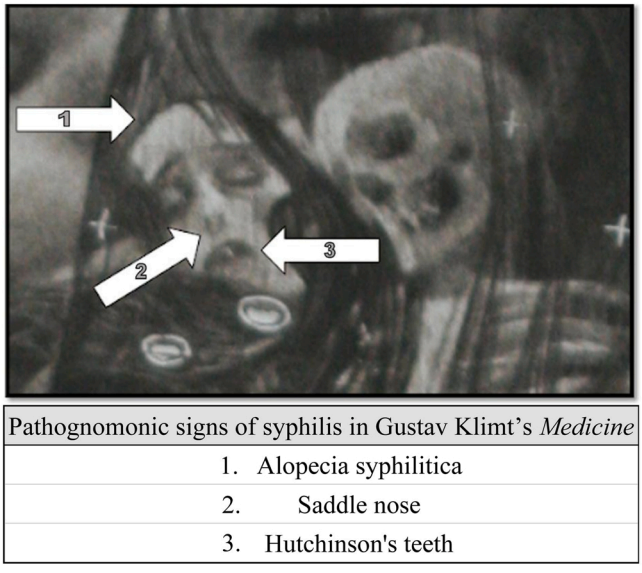

Fig. 3. The detail of the feminine figure with at least three pathognomonic signs of syphilis (white arrows). Edited by the authors by a version of Medicine taken from the public domain. Wikimedia Commons.

Conclusions

Paleopathological records indicate that congenital syphilis had been present in Vienna since the 18th century, emphasizing its historical persistence [62]. At the beginning of the 20th century, syphilis was one of the main causes of morbidity and mortality in the city, as well as in other European capitals, and those affected were socially stigmatized. The interest in identifying the cause of this debilitating disease was so great that in just 10 years, from 1900 to 1910, *Treponema pallidum* was discovered as the cause of syphilis, and Salvarsan was produced. Some scholars have speculated about a syphilis diagnosis affecting famous painters such as Eduard Manet, Paul Gauguin, Vincent van Gogh, and Goya. Others, like Eduard Munch, were clearly inspired by syphilis in their works [1].

We identified the presence of saddle nose deformity, Hutchinson's teeth, and alopecia in a figure depicted in "Medicine" by Gustav Klimt.

Following a comprehensive evaluation of the painting, including its artistic and historical context (according to the methodology previously described), and taking into account the inherent limitations of iconodiagnostic assessment, congenital syphilis emerges as the most plausible diagnostic hypothesis to explain the pathological features identified by our iconodiagnostic team.

Therefore, in accordance with established guidelines for iconodiagnosis [21], and with an estimated level II evidence, we hypothesize that the artist portrayed a case consistent with syphilis.

Given the widespread nature of this infectious disease in Vienna during those years, we speculate that Klimt may have deliberately chose to represent syphilis, and associated it with the figure symbolizing death to underline the fragility of human existence and the inability of the medicine of that time to modify the course of human life and counteract human suffering. However, the lack of documentation on the artist's intentions prevents confirmation that the observed features were meant to represent specific pathologies.

In conclusion, the painting represents a further observation of how the arts represent the scientific and cultural aspects of the time, and are influenced by them.

Limitations

The present study has several methodological limitations. First, the iconodiagnostic analysis is based exclusively on black-and-white photographic reproduction of "Medicine" by Gustave Klimt (as the original work was destroyed in 1945), limiting the ability to accurately assess chromatic details, texture, and potentially relevant anatomical features. Furthermore, the clinical interpretation of symbolic figurative elements inevitably involves a degree of subjectivity, which is ampliated by the allegorical nature of the painting, as it was not intended to serve realistic or documentary purposes. Klimt's art is deeply centered on the female figure, portrayed not merely as decoration but a bearer of aesthetic, psychological, and cultural meaning. The female face plays a crucial role shifting from realistic detail to symbolic stylization to express themes such as sexuality, life, and mortality [63]. The examined figure is similar to other figures that Klimt has depicted in "Beethoven Frieze" to represent illness, madness, and death. Moreover, as already reported in the text, the lack of documentation on the artist's intentions prevents confirmation that the observed features were meant to represent specific pathologies.

Authors' contributions

OS and MM designed and conceived the manuscript. OS, AP, AP, EG, VZ, FB, SDB, MM and DO performed a search of the literature and drafted the manuscript. AP, SDB and DO critically revised the manuscript. All authors have read and approved the latest version of the paper for publication.

Ethical declarations

Not applicable.

Declaration of Generative AI and AI-assisted technologies in the writing process

We declare the use of AI for English orthographic improvement (InstaText).

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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