ISSN: 2755-6328

Case Report

Open Access Journal of Pharmaceutical Sciences and Drugs

A Novel Information Technology in Management of Neuro-Infection After Subdural Empyema: A Case Report

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Received: July 08, 2025; **Accepted:** July 14, 2025; **Published:** July 22, 2025

ABSTRACT

There is little data in the literature on the possible sequelae of subdural empyema. The presented case describes the novel information approach in diagnosis and treatment of a patient, who, after surgery for interhemispheric empyema, continued to have various complaints manifested by signs of damage to the nervous system, with which he sought treatment at the Outpatient department of the Research Institute of Virology. The patient underwent medicament testing to identify possible infectious agents in the patient's internal organs, followed by application of levofloxacin, ribavirin and nystatin (tablet forms) placed in the field created by an ultra-low intensity laser as it passes through a spirally twisted waveguide emitter of the "device for transfer information from a drug to the human body".According to the MRI of the brain and the patient's clinical condition, this management tactic led to the disappearance of the patient's leading complaints, a decrease in the symptoms of the disease, and an improvement in the prognosis of the pathological process. The proposed clinical approach is innovative, and the case report describes the results of treating a patient with neuro-infection after subdural empyema who was treated with a novel information medicine method. The study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Institutional Review Board of the Research Institute of Virology.

Keywords: Medicament Testing, Acupuncture Point, Device for Transfer of Information from the Drug to a Human Body, Subdural Empyema, Neuro-Infection

Introduction

The objective of our study was to investigate the potential of medicament testing (MT) in diagnosing infection in a patient who had previously undergone subdural empyema surgery, and to explore the use of a "device for transferring information for a drug to the human body" (DTI) in eliminating the identified pathogens.

The system of electropuncture diagnostics (EAV), developed by R. Voll, includes a medicine testing method, the purpose of which is to study the influence of drugs on the altered electrodermal activity of acupuncture points (AP) located on the surface of human skin [1]. We have improved the method of medicine testing and developed a new approach to detect infectious agents [2]. An integral part of medicament testing (MT) is the use of various allopathic and homeopathic remedies to restore altered electrodermal activity at the acupuncture point under study. Antiviral, antibacterial, and antifungal drugs are used as allopathic remedies when conducting MT in infectious pathology. Antigens and toxins of bacteria, viruses, and other infectious agents, prepared according to the principles of homeopathic pharmacopoeia, are used as nosodes [3].

The invention of the "device for remote transfer of information from a drug to the human body" (ITD) was based on the results of more than 40 years of research by scientists from the Russian Academy of Medical Sciences on ultra-weak radiation in intercellular interactions [4-7]. Russian scientists discovered the so-called "mirror cytopathic effect" reflecting the interaction of two identical cultures (primarily trypsinized human embryonic fibroblasts, human embryonic eye cells, a transplantable culture of human cervical cancer epithelial cells, i.e., cells of the same

Citation: Djumaeva Naylya. A Novel Information Technology in Management of Neuro-Infection After Subdural Empyema: A Case Report. Open Access J Pharma Sci and Drug. 2025. 1(2): 1-4. DOI: doi.org/10.61440/OAJPSD.2025.v1.15

species, transplantable lines of monkey inguinal gland cells, mouse fibroblasts, i.e. interspecies tissue cultures) placed in chambers connected by quartz substrates with high penetrating ability. Exposure of cultures in one chamber to various influences (poison, viruses, sublethal dose of ultraviolet radiation) led to the death of the culture. After some time, the death of the culture in the adjacent chamber, isolated from the first culture, was observed. It was concluded that the source of the signal information could be ultraviolet or infrared radiation generated by the interaction of two cellular systems.

Further studies led to the creation of a "device for remote transmission of information from a medicinal product to the human body" (ITD). The studies were conducted in vitro and in vivo. When an insulin ampoule was placed in a spiral light guide-emitter of the DTI located over the liver area of a patient with diabetes mellitus, a decrease in the concentration of glucose in the patient's blood was observed, similar to the effect of an insulin injection. In a patient with a heart rhythm disorder, when an adrenaline solution was placed into the DTI over the heart area projection, the patient's heart rhythm changed, as indicated by ECG data. When a volunteer was placed directly in the field of action of a large size of the DTI without any medicinal products, subsequent EEG, ECG, and various clinical and biochemical tests did not reveal any changes in the patient's condition [6,7]. Thus, russian scientists have demonstrated the phenomenon of information transfer from one object to another, provided that an external light source supplies electromagnetic radiation that induces the processes involved in this transfer. According to the description of the Russian Federation patent issued for ITD, the light source (external electromagnetic field) of the proposed device can be: 1) a 2.8 V bulb, the power source of which is an electric battery, or 2) a helium-neon laser. Considering the capabilities of semiconductor laser diodes, specifically their small dimensions and low energy consumption, a red laser with a wavelength of 650 nm, powered by an electric current, was chosen as the light source.

The study by R. Cowie of 89 patients who had suffered a subdural empyema found that some patients subsequently had hemiparesis, visual field deficits, and early or late epileptic seizures [8]. The presented case describes an informational technology approach to treating a patient with a neuro-infection as a consequence of previous subdural empyema using levofloxacin, ribavirin, and nystatin placed in a ITD, which led to the disappearance of the patient's significant complaints, the mitigation of the disease symptoms, and the positive dynamics of the disease according to the brain's MRI data and the improvement of the pathological process prognosis.

Case Report

In June 2023, a 48-year-old white (Russian) man presented to the Research Institute of Virology with complaints of increased fatigue and vision problems, manifested in the form of sudden glare in the eye; loss of peripheral vision on the right, periodic dizziness and headaches, muscle weakness in the right arm and leg, more pronounced in the leg with difficulty walking, 10 kg weight loss, and "brain fog" symptoms, i.e. lack of concentration, forgetfulness and slow thinking process. Due to the above complaints, the patient was unable to work and required care from relatives. The patient has a medical history of frequent exacerbations of chronic sinusitis, chronic otitis media, and moderate SARS-CoV-2-associated pneumonia in December 2022. In February 2023, he experienced another exacerbation of otitis media and formation of subdural empyema, which was subsequently successfully operated on. On examination, the patient's vital signs were within normal ranges. Horizontal gaze-evoked nystagmus was more pronounced on the right. A visual field examination revealed right-sided homonymous hemianopsia. The pyramidal weakness of the right limbs was estimated at 3/4 points on the Medical Research Council scale in the arm and 2/3 points in the leg; the patient also exhibited spasticity, hyperreflexia, and a Babinski reflex on the right side. There was a sensory impairment of the hypoesthesia type from Th 7-8. No cerebellar abnormalities were observed. The patient was in a depressed mood. Serological examination of the patient revealed negative results for HSV-1, EBV, JC virus, and Toxoplasma gondii. Cerebrospinal fluid serology was negative for HIV, HBV, HCV, brucellosis, tuberculosis, and syphilis. Urinalysis showed growth of Candida spp. The patient was offered non-invasive medicament testing (MT) followed by the use of ITD with tested allopathic drugs in it.

Description of the Intervention

MT was performed using a device called "Vistron" for EAV diagnosis (Kindling, GmbH Medizintechnik), equipped with the EAV HomopathR S software system. The EAV readings of the tested access points (APs) were recorded and analyzed before and after the maintenance test (MT). EAV diagnosis was performed according to the standard developed by the device manufacturer. Taking into consideration the patient's complaints, the history of the present illness and his medical history, the following APs (or Voll's measurement points (MP) were used: Ly1-1, Ly3, Kr8a, Ne1 to measure the level of electrodermal activity, where the Ly designates the lymphatic system meridian, Kr - the circulation meridian, and Ne - the nervous system meridian[9]. Given the patient's medical history, including the exacerbation of otitis media and the presence of Candida spp. in the urine, the following nosodes and medications for MT were used: the nosode of Streptococcus spp. in 30C dilutions, and levofloxacin (500mg, tablets) for Candida spp. nosode in 30C dilutions, and nystatin (500,000 U, tablets). The first, the Streptococcus spp. nosode of in 30C dilutions, and levofloxacin were used. A detailed description of the described approach has been presented earlier [2]. Table 1 presents the MT results obtained before the first session of exposure using the nosode Streptococcus spp. in 30C dilutions and levofloxacin (500 mg).

Table 1: The results of MT before the first session of exposure

MPs	MT pre-test readings(units)	Indicator drop (units)	MT post-test readings(units)	Interpretation of the data obtained
Ly1-1	38	12	60	positive response
Ly3	40	10	62	positive response
Kr8a	36	14	58	positive response
Ne1	38	12	58	positive response

Note: MPs - measurement points; MT - medicament testing, Ly - the lymphatic system meridian, Kr - the circulation meridian, and Ne - the nervous system meridian. The MT pre-test readings (units) show the results of the AP values after the indicator drop phenomenon. The MT post-test readings (units) reflect the results obtained after the Streptococcus spp. nosode and levofloxacin (tablet) were placed in the EAV apparatus honeycomb in the MPs under study during the MT process. The presented data demonstrate that a positive response to MT was obtained for all selected MPs: Ly1-1, Ly3, Kr8a, and Ne1. Levofloxacin was selected based on the results of the previously conducted antibiogram for our patient. Table 2 presents the assessment of the MT results obtained during EAV diagnosis.

Table 2: Assessment of Medicament Testing Reading Results

№	Indicator Readings(U) after Medicament Placement Into the Honeycomb	Tested Drug Effect on the AP
1	No changes	No effect
2	The device indicator stops dropping	Positive response
3	The device indicator returs to normal values(50-65U)	Positive response
4	The device indicator shows a more significant drop	Negative response

Figure 1 demonstrates the schematic diagram of the ITD used in the study [6]. The Russian patent recommends using only allopathic drugs, so levofloxacin was used inside the IDT at the first session.

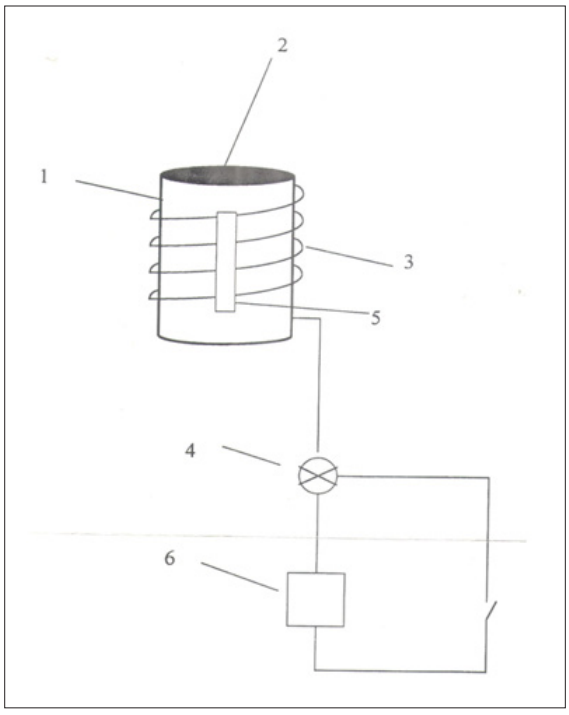


Figure 1: Diagram of the ITD used in the study

The device consists of a hollow closed by lid (2) cylinder-emitter (1) made of non-conductive material (cardboard) around which, on the outer surface, a light guide (3) twisted in a spiral, top-down direction, connected to a light source (4); a medicine is places inside the cylinder (5;) a light source (4) is connected to power supply (6).

Voll points out the relationship between the internal organs and the positive response to levofloxacin obtained during MT: Ly1-1 - corresponds to the lymph outflow from the ear; Ly3- a lymph outflow from the mucous membranes of the nasal cavity and paranasal sinuses; Kr8a- a deep cervical lymph nodes and thoracic lymphatic duct, Ne3 - corresponds to the brainstem and brain [9]. The patient was given an explanation of the procedure for using ITD and was told that he could refuse to participate in the study. Lying on the couch in the supine position, the cylinder (a spiral light guide-emitter of the "device for transmitting information from the drug to the human body") is positioned over the projection of the organ on the body surface, as selected by the doctor based on the previously conducted medicament testing results. Then the drug is placed in the cylinder, and the laser device is turned on. The radiation power of the laser device does not exceed five mW (according to the patent). The procedure lasts no more than 30 minutes, after which the laser device is switched off. The following organs were planned to be exposed to the effect: ears (D, S), paranasal sinuses (D, S), deep cervical lymph nodes and thoracic duct, and brain (D, S).

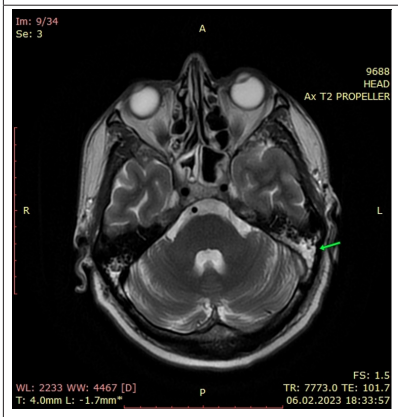
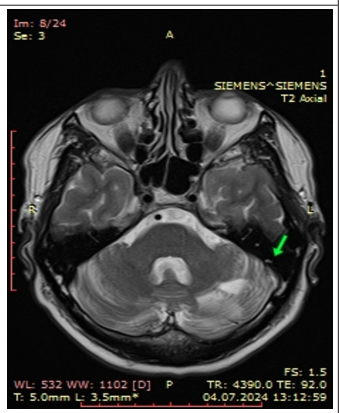
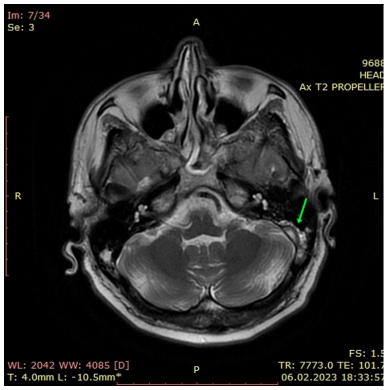
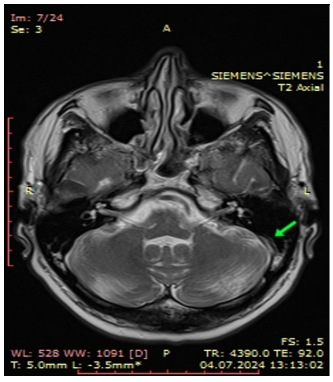
During the first session, the spiral light guide-emitter of the ITD was placed above the projection of the left ear, followed by the right ear, as described above, using levofloxacin. Similarly, during the first procedure, all organs were sequentially exposed to levofloxacin. When exposing the brain, the patient was placed in a lateral decubitus position (D, S), and the exposure was carried out separately over the projection of the following brain regions: the temporal lobe, frontal lobe, parietal lobe, occipital lobe, and cerebellum. The procedure lasted a total of two hours. After the procedure, he experienced slight weakness for two days and required additional rest. Ten days later, the patient underwent the MT, which revealed a negative response to nosode of Streptococcus spp. and levofloxacin at all MPs that

previously demonstrated positive responses to these drugs, as presented in Table 1.

The MT was conducted at the second therapy session using the nosode of Candida spp. in 30 dilutions and nystatin (500000 U, tablets). The following MPs showed a positive response to MT with the mentioned drugs: Ly1-1, Ly3. They were associated with the following organs: Ly1-1- lymph drainage from the ear; Ly3- lymph drainage from the mucous membranes of the nasal cavity and paranasal sinuses. The patient was exposed to nystatin above the projection of the specified organs with the application of ITD, and nystatin was placed into the device. Ten days later, the patient was again examined by MT, which revealed a negative response to the nosode of Candida spp. and nystatin at the MPs, previously demonstrating a positive response to these drugs.

One month after completion of therapy, in July 2023, the patient continued to complain of increased fatigue and vision problems, manifested in the loss of peripheral vision on the right, muscle weakness in the right arm and leg, and difficulty walking. The patient's previous vision problems, i.e., sudden glare before the eyes, periodic dizziness, headache, and brain fog symptoms, no longer bothered him. MT showed a negative response to levofloxacin and nystatin and restoration of electrodermal activity readings to normal values at all tested MPs.

Thus, in June and July 2023, the patient underwent two sessions using a ITD with tested drugs placed inside it. On his last scheduled visit on July 7, 2024, the patient complained only of the loss of right lateral vision and slight weakness in the right leg. The neurological examination revealed the right-sided homonymous hemianopsia. Deep reflexes in the upper limbs were normal and slightly increased in the right leg. The patient's pyramidal weakness in the right leg was 4/5 (Medical Research Council scale), with slight spasticity, hyperreflexia, and a positive Babinski reflex. There was no sensitivity impairment. The patient was in a good mood. He gained 10 kg. The patient leads an active social life, has returned to work (as the sole breadwinner in the family), and feels healthy. The brain MRI data obtained with contrast on 07.04.2024 revealed extensive cystic, gliotic, and atrophic changes in the left hemisphere of the brain, as well as in the upper parts of the cerebellar vermis, and indirect signs of moderate intracranial hypertension. Figure 2 illustrates the dynamics of changes in the MRI data during therapy, with the application of the ITD.

06.02.23	04.07.24	Description
		06.02.2023. Inflammatory changes in the cells of the mastoid process of the left temporal bone are noted As of 04.07.2024. No inflammatory changes in the mastoid process of the left temporal bone were detected.
		06.02.2023. Inflammatory changes in the cells of the mastoid process of the left temporal bone are noted As of 04.07.2024. No inflammatory changes in the mastoid process of the left temporal bone were detected.

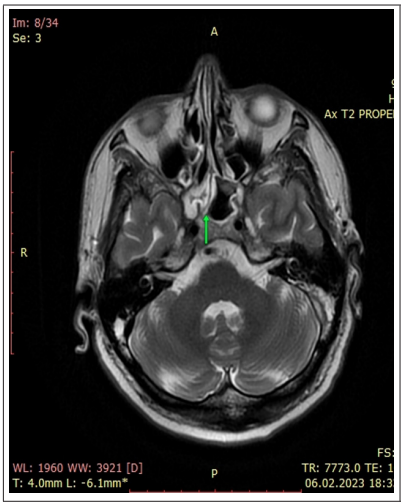
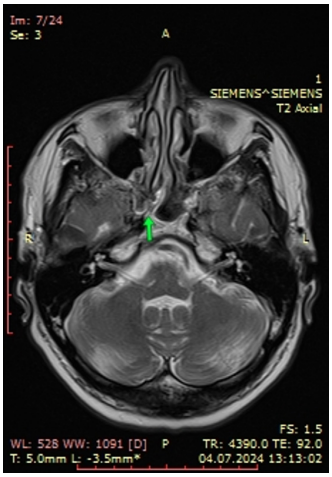
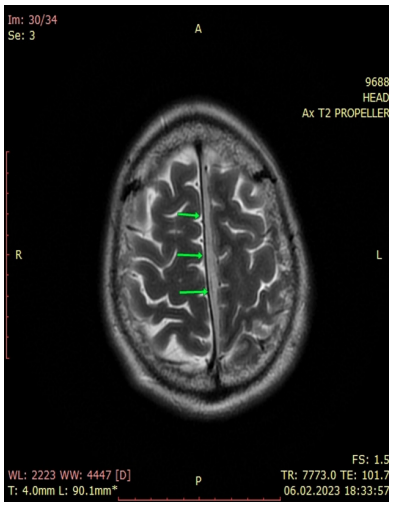
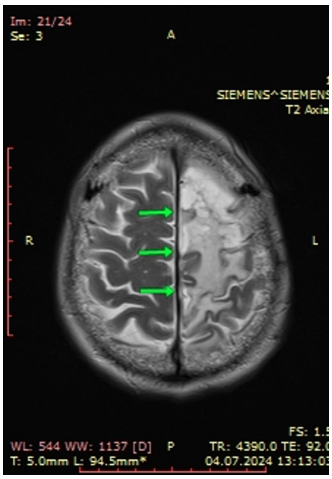
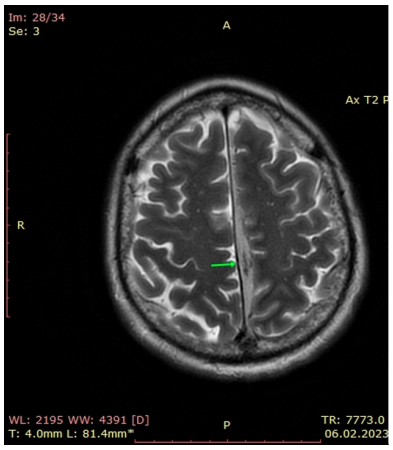
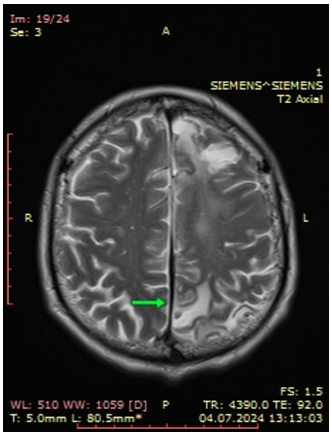
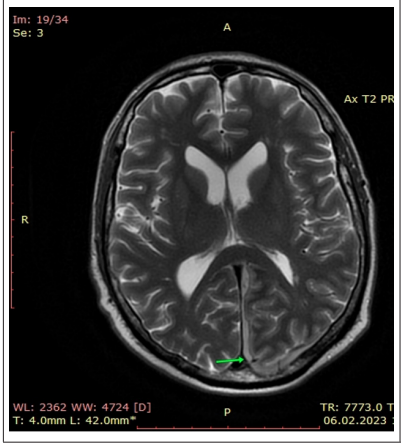
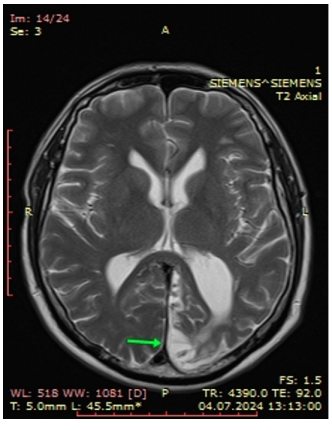
		06.02.2023. Inflammatory changes are detected in the sphenoid sinus. On 04.07.2024. Minor inflammatory changes are noted in the sphenoid sinus.
		06.02.2023. An extra-axial subdural left parafalcine empyema is noted along the falx on the left As of 04.07.24. Areas of encephalomalacia and gliosis in the left frontal lobe of the brain are detected
		06.02.23 Extra-axial subdural left parafalcine empyema along the falx on the left is detected As of 04.07.2024. Areas of encephalomalacia and gliosis in the left parietal lobe of the brain are noted
		06.02.2023. Extracerebral subdural empyema area along the falx and occipital region on the left is detected as of 04.07.2024. Areas of encephalomalacia and gliosis in the left occipital lobe of the brain are noted

Figure 2: MRI data of the patient's brain from 2023 to 2024

Study Supervision

The research is an investigator-initiated study, and its protocol was approved by the Institutional Review Board of the Research Institute of Virology (5/12-1815; 2023). The patient provided written informed consent before inclusion in the study and subsequently for the publication of this article, in accordance with the principles outlined in the Declaration of Helsinki. The author vouches for the completeness and accuracy of the data and the study's compliance with the protocol.

Discussion

This case report informs about a patient with signs of neuro-infection after a previously successfully operated subdural empyema. Possible complications in patients after a subdural empyema include hemiparesis, visual field deficits, and early or late epileptic seizures. Our patient had hemiparesis and visual defects, but he also presented other complaints, which led us to suspect that the patient had an unresolved inflammatory process in the central nervous system. This conclusion led to the use of MT and ITD to eliminate pathogens from the patient's body.

The most common causative microorganisms in brain abscesses are known to be Streptococcus and Staphylococcus species, with predisposing conditions primarily involving contiguous or metastatic foci of infection [10]. Levofloxacin is a synthetic antibacterial drug from the fluoroquinolone class that exhibits bactericidal activity. It blocks DNA gyrase and topoisomerase IV, disrupting the supercoiling and cross-linking of DNA, inhibiting DNA synthesis, and causing profound morphological changes in the cytoplasm, cell wall, and membranes of microbial cells. The drug is active against most strains of microorganisms, including aerobic gram-positive organisms, which determined its choice in this study. Levofloxacin was chosen due to its high sensitivity, as demonstrated by the antibiotic susceptibility test previously performed on our patient.

The presence of fungi in the patient's body was a result of multiple exacerbations of sinusitis and otitis media in the past, accompanied by subsequent antibiotic therapy without adequate control of possible fungal growth. The patient's failure to use antifungal drugs was confirmed during the examination. Therefore, the fungal growth in our patient's urine prompted the search for Candida fungi in the foci of bacterial infection, specifically in the ears and sinuses. Nystatin belongs to the group of polyene macrolides, the mechanism of action of which involves blocking the synthesis of ergosterol in the fungal membrane, leading to its lysis and ultimately the death of the microorganism. This drug is active against yeast and yeast-like fungi - Candida spp.

SARS-CoV-2, the virus responsible for COVID-19, has been the subject of extensive research since its emergence in late 2019. The symptoms of SARS-CoV-2 associated with Long COVID include fatigue, brain fog, shortness of breath, and others. The pathogenic mechanisms underlying these symptoms of long COVID remain largely unclear; however, several hypotheses suggest that both nervous system and systemic pathogenic mechanisms are involved, including viral persistence, neuro-invasion by SARS-CoV-2, abnormal immunological responses, autoimmunity, coagulopathies, and endotheliopathy [11]. A previous infection, including chronic otitis media and chronic sinusitis, may have contributed to the development of Long COVID symptoms in our patient. This bacterial infection contributed to the dysregulation of the immune system, and consequently, the patient experienced Long COVID symptoms after recovering from acute SARS-CoV-2-associated pneumonia.

Considering the patient's complaints and medical history, we selected the specified antibiotics with corresponding nosodes for MT. No attempts had been made previously to use antibiotics in an ITD to treat a patient with signs of neuro-infection, and this case is the first to describe such an approach. We were unable to find any publications on the application of similar devices to transfer information from drugs to the human body for the treatment of infectious diseases by other authors. The description of the proposed technology in the treatment of patient with multiple sclerosis has been published [12].

The mechanism of information transfer from a drug to the human body in the ITD can be explained as follows: the ultra-weak electromagnetic field generated inside the cylinder (spiral light guide-emitter) of the ITD when the laser device is turned on cause's activation of molecules of chemical elements included in the composition of the medicine located inside the emitter, which leads to vibration and oscillations of these molecules. It is assumed that the oscillations of the molecules lead to the formation of a special field inherent in the chemical structure of the medicinal product located inside the emitter, namely the creation of an electromagnetic cast-imprint of the crystal lattice of an organic substance, for example, a drug. It is suggested, that since the direction of the waveguide located on the outer wall of the spiral light guide-emitter goes from top to bottom, the vector of field motion inside it is also directed from top to bottom, which, in turn leads, to the transfer of the formed electromagnetic cast-imprint down the vector of the emitter field. Further, the formed electromagnetic cast-imprint of the preparation penetrates human tissue and interacts with the ultra-weak photon radiation inherent in the infectious agent (the penetrating ability of the emitter field, according to Russian scientists, exceeds several meters, overcoming all obstacles) [7]. The interaction of two identical fields directed towards each other apparently leads to the destruction of both fields and the biological object itself - the infectious agent, the carrier of ultra-weak photon radiation. The phenomenon of resonance in physics can serve as an analogy here [13]. This assumption requires rigorous proof.

The study of spectral characteristics of chemical molecules in pharmaceutical preparations is the basis of near-infrared spectroscopy, a method widely used in pharmacy. IR spectroscopy is based on the absorption of infrared electromagnetic radiation by molecules of the substance being studied. Under the influence of IR radiation, excitation and the subsequent occurrence of vibrational and rotational states of the molecules themselves occur, allowing for the study of the composition of drugs [14]. In January 2015, scientists from the Michigan University published an article describing the use of an ultrafast spectroscope to detect the natural vibrations of viral particles, specifically a lentiviral pseudo-virus. The natural vibration frequencies of biological particles, such as viruses and bacteria, encode essential information about their mechanical and biological state as they interact with the local environment and undergo structural evolution. The scientists ' research found that the

ultrasound spectrum of the 80-100 nm lentiviral pseudo-virus reveals vibrational modes in the range of 19-21 GHz, which are sensitive to the virus's morphology [15]. According to the authors, the approach's sensitivity, high resolution, and speed promise a deeper understanding of the biological dynamics and early diagnosis at the level of individual microorganisms.

We use a semiconductor laser diode because the laser part of the device serves only as a light source. Its special properties, such as monochromaticity, coherence, fixed polarization, and narrow directivity, are not crucial for this device. Lasers with a power of less than 25 mW and a wavelength of 400-700 nm are classified as first-class laser devices and are considered safe for human beings [16].

Ultra-weak photon radiation inherent in the cells of various objects is the subject of research by many scientists [17-20]. Ultra -weak photon emission (UPE), also known as biophoton emission, is commonly observed in a wide range of living organisms, including humans. This phenomenon is closely associated with reactive oxygen species generated during normal metabolic processes and pathological states induced by oxidative stress. However, this phenomenon concerns not only living beings, as according to Kaznacheev VP (2002), drugs in the human body realize their pharmacological effects not only at the level of chemical compounds that form the medicine, but also at the level of the electromagnetic component inherent in the medicine [7]. Apparently, inside the "device for transferring information from the drug to the human body", this electromagnetic component, under the influence of external electromagnetic radiation, acquires the ability to realize itself.

Limitations of the Study

This study has some limitations. The study was conducted on only one patient, which significantly limits the ability to assess the findings objectively. The only one medicament testing expert with 34 of experience participated in this study. However, several MT specialists should be included in future studies to compare the obtained results and the reproducibility of the MT method. Further studies with a larger sample size and improved design are warranted.

Conclusions

The described case is innovative and interesting because, for the first time, the novel information technologies for diagnosing and treating the consequences of subdural empyema are proposed. The diagnostic part involves studying the electrical properties of APs using specialized equipment, as well as homeopathic and allopathic drugs. The therapeutic part of the proposed approach utilizes the electromagnetic component of allopathic medicines, employing a specific device (ITD) to transfer information from a drug to the human body. Considering the difficulties of treating patients with brain damage from the point of view of problems in treating such patients (due to the blood-brain barrier, which forces a multiple increase in the doses of administered antimicrobial drugs, the need for long-term delivery of drugs to the brain in a patient with chronic brain pathology), the proposed technology is promising for both doctors and patients. However, further studies and the use of appropriate equipment are required to include more patients and obtain convincing data on the potential application of the proposed technology in patients with brain pathology.

Acknowledgments

The author would like to thank Ahmedov I.B., M.D. from the National Multidisciplinary Medical Center, Radiological Department, for his help in describing and interpreting the MRI data.

Disclosure Statement

Funding

No funds, grants, or other support were received.

Ethical Approval

The study was conducted according to the principles of the Declaration of Helsinki and was approved by the Review Board of the Research Institute of Virology (5/12-1815;2023).

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Conflict of Interests

Author declares no "Conflicts of Interest".

Author's Contribution

ND performed the study design, conceptualization, methodology, investigation, the original draft preparation, and the final version for publication.

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