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PULSED MAGNETOTHERAPY ON CUPOLOLITHIASIS OR CANALINOLITHIASIS THERAPY. AN EXAMPLE OF PHYSICAL INFORMATION THERAPY

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ABSTRACT

An electromagnetic approach to pathologies affecting the inner ear can be considered legitimate based on the understanding of the piezoelectric mechanisms underlying vestibular and cochlear physiology. We owe to the mechanisms of serendipity[1] the possibility of considering the pulsed magnetic field (CEMP) effective in the pathology called cupololithiasis / canalinolithiasis. The characteristic waveform, with which the equipment was equipped and which fortuitously supported the resolution of the first case of cupololithiasis, represents the essential in the context of an informational therapy, according to the canons of Electraceutical therapy.[2] The efficacy, in the first intention of the CEMP, defines a shallow depth of the noxa underlying a pathology such as positional vertigo that recognizes many causes, some of which are chronic. In these cases, patient management requires an integrated approach, in which the CEMP makes its contribution. The dynamics of interaction between matter and energy, underlying the use of pulsed magnetism, take place in compliance with the principle of conservation of energy and punctually confirm the foundations of quantum medicine.[3,4,5]

KEYWORDS: Cupololithiasis, Canalinolithiasis, Serendipity, CEMP, Mitochondrial Barrage, Informational Therapy, Electraceutical therapy.

INTRODUCTION

An electromagnetic solution to pathologies that afflict the inner ear can be considered legitimate from the awareness of the piezoelectric mechanisms underlying vestibular and cochlear physiology.

Over the years of clinical practice, a relationship between electromagnetic fields and balance disorders had been noticed. In this conception we are in perfect agreement with Prof Bistolfi, who believes that piezoelectricity can represent the instrument of different non-ionizing relationships, defined as NON-IONIZING RADIATION.[6]

After citing the definition from Arnold Ganzer Iurato's manual[7], and returning to the context of outpatient otolaryngology practice, we will discuss a case that warrants a brief narrative.

Positional vertigo can be triggered by the pathological displacement of calcium crystals on the sensory epithelium of a semicircular canal dome (Cupulolithiasis) or by free-floating otolith particles suspended in the lumen of the semicircular canals (Canalithiasis).

A 67-year-old woman presented for her first visit due to the onset of benign paroxysmal positional vertigo (BPPV). She was subsequently found to have vitamin D deficiency and was treated with supplementation. A Semont maneuver, both diagnostic and therapeutic, was performed during the first visit, which promptly restored her to an asymptomatic condition. She later returned for a scheduled follow-up. At a subsequent point, the patient underwent a brain MRI, prescribed by a neurologist who had been consulted prior to the otolaryngology visit. However, during the MRI, after hearing a click in the affected ear, she experienced dizziness again. As anticipated, her symptoms resolved after further repositioning maneuvers of the otoliths.

This case, due to its unique characteristics, drew attention during the patient's history-taking process, revealing that many patients who underwent brain, cervical spine,

or shoulder MRIs sometimes experienced otolith detachment, with a consequential chronological relationship.

The observation of a fragility in the utricle-saccule unit, which led to a reduction in the bonding capacity between otoconia and the supporting structures (the maculae), necessitates the search for a "rational explanation".[8] It must be acknowledged that the magnetic field of the MRI may provoke a displacement of the otoconial material within the labyrinth, potentially leading to the onset of positional vertigo symptoms as a result of this altered functional geometry.

Anticipated by the Aristotelian aphorism "the whole is greater than the sum of the parts", the conceptualities supported by Entropy and Enthalpy[9] of the system enter thescene.

The observational study in question aims to establish a causal consequential relationship between the Electromagnetic fields and the dynamics of the otolith; according to Bistolfi, transduction processes between electromagnetic energy and mechanical energy are at play.[10] Just as the detachment was observed at exposure to CEMP resulting in BPPV, in accordance with what is symbolically represented by the Caduceus, it is possible to consider a therapeutic role of CEMP itself in spontaneous pathology. Bistolfi, in addition to His literature, states that NON-IONIZING RADIATION biostimulation, in particular magnetic bio-stimulation, in able to induce order.[11] We declare that the study did not receive any financial support, the premises were granted free of charge by UNISED University, the patients did not incur any expenses.

MATERIALS AND METHODS

All patients diagnosed with Benign Paroxysmal Positional Vertigo (BPPV) underwent a comprehensive examination, which included taking a detailed medical history focused on identifying the positional characteristics of their vertigo episodes and any associated pathologies. This was followed by a bedside examination aimed at detecting spontaneous and provoked vestibular signs, particularly through the use of triggering maneuvers proposed by various authors. For those patients who did not opt for magnetotherapy as an initial treatment, repositioning maneuvers were performed instead.

Instruments Used: The instruments used included a Fiber Optic AIESI® Otoscope, a medical examination table for diagnostic maneuvers, and a simple chair for administering the pulsed electromagnetic camp (CEMP) therapy using a dedicated device known as "OneJoule" – Electronic Product for Life.

Technical Specifications of the Equipment: The CEMP device used in this observational study emitted a ***"bipolar signal"***, which was specifically designed to avoid any pain-inducing (algogenic) characteristics. Analysis of the waveform using an oscilloscope revealed both positive and negative peaks (Fig.1). The device generated medium amplitude pulses around 300 V, with the signal produced by a solenoid with a low number of turns, creating a magnetic field of 10,000 Gauss (1 Joule/microsecond), and peak currents of 140-145 A/microsecond. The modulation dial allowed for the delivery of the bipolar signal at frequencies ranging from 1 Hz to 15 Hz, divided into five channels (Fig2).

It is important to note that the PEMF device was initially selected for its effectiveness in treating a pilot case recruited for another inner ear pathology, specifically a study on tinnitus. The pilot case involved a 63-year-old male with no comorbidities, who suffered from right-sided tinnitus and recurrent cupulolithiasis affecting the right lateral and posterior semicircular canals following an episode of Herpes Zoster auricularis contracted at the age of 22. After being fully informed, the patient consented to participate in the study. At the conclusion of the CEMP therapy, the patient reported the persistence of tinnitus, the onset of a headache, but the resolution of the BPPV that had been affecting him for three weeks. Upon further evaluation, both subjective reports and objective examination confirmed the absence of BPPV. This serendipitous outcome was reminiscent of Oersted's discovery when he observed the interaction between a compass needle and an electric current flowing through a wire. Such empirical research often reveals unexpected possibilities to attentive observers.

The headache, which lasted for 36 hours and resolved without any treatment, was hypothesized to be a result of excessive magnetic stimulation. Therefore, mindful of Weber and Fechner's law[12], the protocol was adjusted for ongoing cases to reduce exposure duration to one minute on the external auditory meatus, followed by a one-minute pause, and then another minute over the tragus, all on the affected ear.

Treatment Protocol: For patients in the observational study, standard treatment sessions involved applying the CEMP therapy to the affected ear following a predefined protocol in terms of time, topography, and delivery. The CEMP device was set to the minimum allowed by the technical specifications (modulation dial in position 1 of 5 available). The treatment sessions were scheduled once per week, for a maximum of three sessions.

Additional Technical Details: The CEMP device used in the study emitted a bipolar signal with no algogenic characteristics. The waveform's intensity and frequency, as provided by the device manufacturer, are shown in Figure 1. According to Professor Franco Bistolfi, while these physical parameters are important, the waveform itself is the most crucial therapeutic input.[13]

Supervision During Treatment: Throughout the magnetotherapy sessions, an otolaryngologist, a physician specializing in Quantum Medicine, and a technician re-

sponsible for operating the PEMF device were present, alternating as needed.

Patient Recruitment and Study Cohort: Patients were recruited from the Experimental Vestibology Clinic at UNISED in Corsico (Milan) if they were experiencing either the initial onset or a relapse of BPPV. After being thoroughly informed about the safety of the energy used, some patients opted for an exclusive treatment approach using pulsed magnetotherapy (PEMF) at the Vestibology Clinic of UNISED University in Corsico (Milan). Patients who experienced short-term relapses after initial repositioning maneuvers performed during their first visit were also included in the observational study.

These problematic cases, which represented a minority among the larger patient population, were offered the option to choose and request magnetotherapeutic treatment after being fully informed, thus re-entering the observational study cohort. Two male patients over the age of 80, who had pacemakers, were excluded from receiving pulsed magnetic therapy due to contraindications.

Case Study: The study included 32 adult patients, 10 males and 22 females, aged between 31 and 84 years (Table 1), who were observed from September 1, 2020, to May 31, 2021. The last patient was included in the study on May 15, 2021, allowing sufficient time to monitor the progress of the established therapy.

The patient cohort was reorganized as detailed in a dedicated figure at the end of this section. In summary, 32 patients underwent CEMP therapy, either as a primary treatment or as a secondary intervention. The latter scenario occurred only in cases where patients experienced short-term relapses following repositioning maneuvers or required both PEMF therapy and maneuvers for stabilization. These maneuvers were performed prior to the magnetic treatment, as suggested by Professor H.Voisin of Aix-Marseille University, a leader in institutional energy medicine, where the protocol is to first apply a mechanical action followed by energy therapy.

All patients who opted for CEMP therapy, whether initially or upon a secondary evaluation, were educated about the mechanism of magnetotherapy and reassured of the harmlessness of the energy form used (defined as NON-IONIZING RADIATION).

ANALYSIS OF THE RESULTS

Of the 32 patients enrolled in the observational study, 22 accepted magnetotherapy as the initial treatment for cupulolithiasis-canalithiasis, and 10 accepted both magnetotherapy and additional maneuvers (Table 2). Out of these 22 patients, 16 responded positively to the therapy without the need for additional maneuvers and remained asymptomatic throughout the observation period. Within this group, 12 patients, marked with an asterisk (*), responded after the first session, while the remaining 4 patients, indicated with a degree symbol (°), required up to three sessions to achieve symptomatic relief.

Four of the 22 patients proved more challenging; after the first session of pulsed magnetotherapy, they also required manual maneuvers. Although the CEMP (pulsed electromagnetic field therapy) provided partial relief, resolving the positional component of their vertigo, these patients continued to experience postural instability. Despite this, control sessions—characterized by a combination of manipulation and magnetotherapy—never exceeded three sessions and were reported by patients to contribute to an overall sense of well-being.

Two patients, initially subjected to magnetotherapy, were found to be refractory to its effects. These patients also demonstrated difficulties with standard BPPV management and underwent further investigations, including Doppler ultrasound (TSA), otovestibular tests (OTV), and MRI scans. These tests revealed more complex diagnoses where vertigo was merely an epiphenomenon of a broader clinical condition.

Ten patients, who initially chose manual maneuvers, requested magnetotherapy in subsequent sessions. These patients were treated with a combination of repositioning maneuvers and CEMP (<3 sessions). Of these, 7 responded to the combination therapy, while no response was observed in the remaining 3 cases.

In total, five patients (3 males and 2 females) exhibited symptoms of dizziness resistant to magnetotherapy, whether used as the primary therapy or in conjunction with repositioning maneuvers (Table 3). Follow-up appointments were scheduled one week after the initial visit, with a maximum of three check-ups, each spaced seven days apart.

Patients who did not respond to CEMP alone or in combination with repositioning maneuvers required further, multidisciplinary management. This approach included detailed otolaryngological, neurological, and physiatric evaluations.

Case Studies

Case 10 (M, 64 years old)

The patient had a history of prostate cancer and uncontrolled type 2 diabetes. During the observation period, he experienced significant cervical pain, which was investigated via X-ray and revealed pathological findings (reduced cervical lordosis, C5-C7 spondylosis). The patient independently sought mobilizations and physiotherapy during the study. Previously, he had experienced an episode of cupulolithiasis five months earlier, successfully treated in a single session with Semont and Epley maneuvers, followed by vitamin D supplementation due to a deficiency. He presented again with a recurrence, which was initially resolved with a session of TMP for the right ear, but relapsed after five days, coinciding with an emergency room visit where he was diagnosed with de-

compensated diabetes. Two additional TMP sessions resolved the positional component of the vertigo, but symptomatic stabilization required a Semont maneuver for the right lateral canal and a third session of magnetotherapy. Professor E. Del Giudice hypothesized that persistent hyperglycemia, through protein glycation, contributed to the patient's refractoriness to CEMP.[14]

Case 19 (M, 55 years old)
The patient, with a history of hypertension, hypercholesterolemia, and psoriasis, presented with positive HST and Halmagyi tests on the right side, showing vertical nystagmus components, and a positive Dix-Hallpike and Pagnini-McClure tests on the right, with apogeotropic nystagmus. The patient refused specific maneuvers. Two sessions of CEMP aggravated his symptoms for several hours, after which he returned to his baseline symptomatic state without further therapy. The patient declined a recommended brainstem MRI.

Case 20 (F, 64 years old)
This oncology patient, recently operated on for breast cancer and fitted with a temporary prosthesis, was known for previous left-sided cupulolithiasis, successfully treated with two maneuvers years earlier. She relapsed postoperatively with BPPV attributed to the left posterior canal. After two sessions of CEMP, she showed improvement and initiated vitamin D supplementation due to deficiency. Following two sessions of laser and Tecar therapy for concurrent neck pain, she experienced a recurrence of positional vertigo and ataxic gait. The interaction between the different frequency therapies in adjacent contexts likely led to a mutual interference, hindering the therapeutic outcome. Further examination confirmed cupulolithiasis of the left lateral canal, treated with a Semont maneuver and CEMP. An MRI was recommended concurrently with the visit, but due to the temporary breast implant, it was postponed until after breast surgery. The MRI revealed 9 mm areolae on the right cerebellar peduncle, pontine-mesencephalic alterations, and right frontal subcortical changes indicative of inflammation. The patient remains symptomatic under multidisciplinary observation and therapy.

Case 26 (F, 78 years old)
The patient presented for her second ENT visit due to dizziness. On a previous occasion, she was not treated with repositioning maneuvers, as her symptoms were considered central vestibular in origin. When she later presented with an ataxic gait, diagnostic maneuvers triggered a cascade of symptoms that she could not tolerate, leading her to decline further repositioning maneuvers. She underwent two sessions of CEMP, which provided no benefit. She was subsequently treated elsewhere with repositioning maneuvers, again without success. An otovestibular examination with rotoacceleratory tests (OTV) revealed bilateral BPPV, uncompensated dysfunction on the right, and a central component with a deficit in the spinal vestibular reflex. The patient also had hypercholesterolemia and vitamin D deficiency. An MRI with brainstem contrast showed diffuse leukoaraiosis, atrophy of the cerebellar vermis, and degenerative changes in the central vestibular pathways, leading the consulted neurologist to discontinue ticlopidine.

Case 17 (M, 82 years old)
The patient, with a history of heart disease treated with ticlopidine and beta-blockers, was initially treated with the Epley maneuver for left posterior canal BPPV (positive Dix-Hallpike test). Two subsequent sessions of CEMP did not completely resolve his symptoms, with a persistent vertigo that was very bothersome to the patient. He was referred for an otovestibular examination with rotoacceleratory tests (OTV), which revealed positive Pagnini-McClure maneuvers bilaterally, hyperreflexic VVOR and VOR, and a pathological VST, leading to a diagnosis of left ageotropic BPPV secondary to cerebellar vascular dysfunction (vertebrobasilar insufficiency confirmed by TSA Doppler). Soludexide was prescribed, but was later replaced with levosulpiride 25 mg twice daily with meals, which stabilized the patient, rendering him asymptomatic.

Additional Case Discussion
Case 23 (M, 31 years old)
This case involves a patient with a history of migraines and vertigo, initially referred by another specialist. Upon presentation, he underwent an Epley maneuver for the right posterior canal, following a positive Dix-Hallpike test on the right, and two sessions of CEMP. Despite resolution of the positional vertigo, the patient developed a vagal syndrome affecting the gastrointestinal system, characterized by pale skin and dark circles under the eyes, but no migraine attacks were noted. Given the complexity of his case, despite being categorized as a responder to both maneuvers and CEMP, the patient was referred for an Electronystagmographic (OTV) examination. This confirmed bilateral hyporeflexia, with compensated bilateral spontaneous nystagmus and hyporeflective VVOR and VOR. The administering colleague, unaware of the observational study, prescribed a nutraceutical containing Q-TER, a clathrate form of coenzyme Q10. The patient quickly achieved stabilization of the vagal syndrome and dizziness after taking Q-TER, suggesting that the dizziness following CEMP might have been due to a transient mitochondrial dysfunction. This observation, along with findings from the pilot case, led to a reduction in the duration of CEMP sessions for subsequent patients while maintaining the therapy's effectiveness. This aligns with the principles of Weber and Fechner's law.

After detailing cases that did not respond to pulsed magnetic therapy, it is worth mentioning **Case 14**. This patient responded to the first session of CEMP but experienced a relapse three months later, where he was resistant to a second session. By coincidence, the patient underwent TECAR Therapy for a shoulder issue, which led to symptomatic improvement of vertigo lasting a day and a half. A third session of CEMP restored the patient

to an asymptomatic state. The case suggests potential interactions between different therapeutic frequencies, leading to both constructive and destructive interference in clinical outcomes. This patient had a long history of bilateral cupulolithiasis, with comorbidities including diffuse angiosclerosis and moderate leukoaraiosis, as confirmed by a brain MRI.

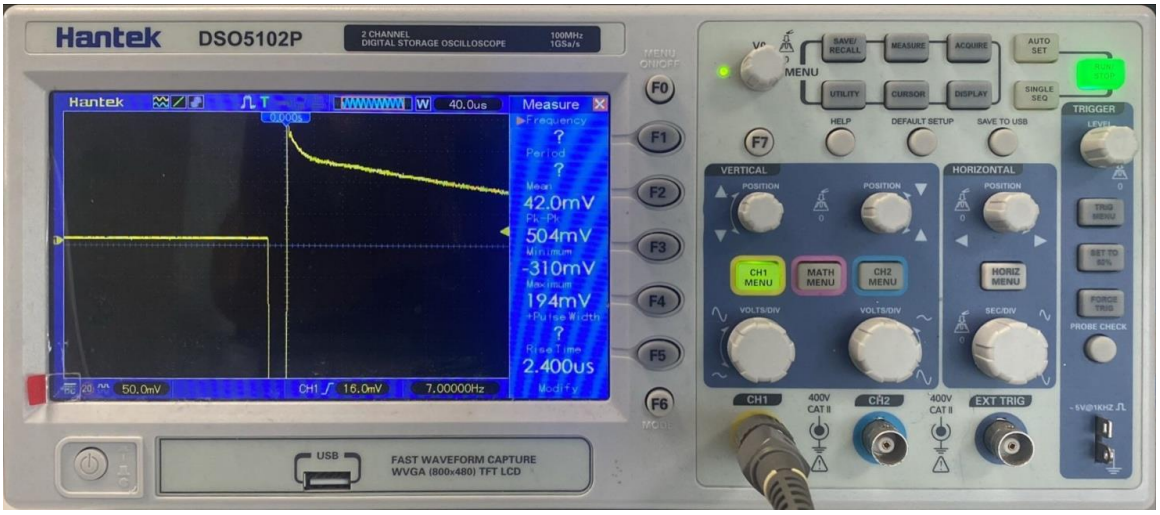

Fig. 1: Waveform highlighted by the oscilloscope.

Fig. 2: Moduilation dial.

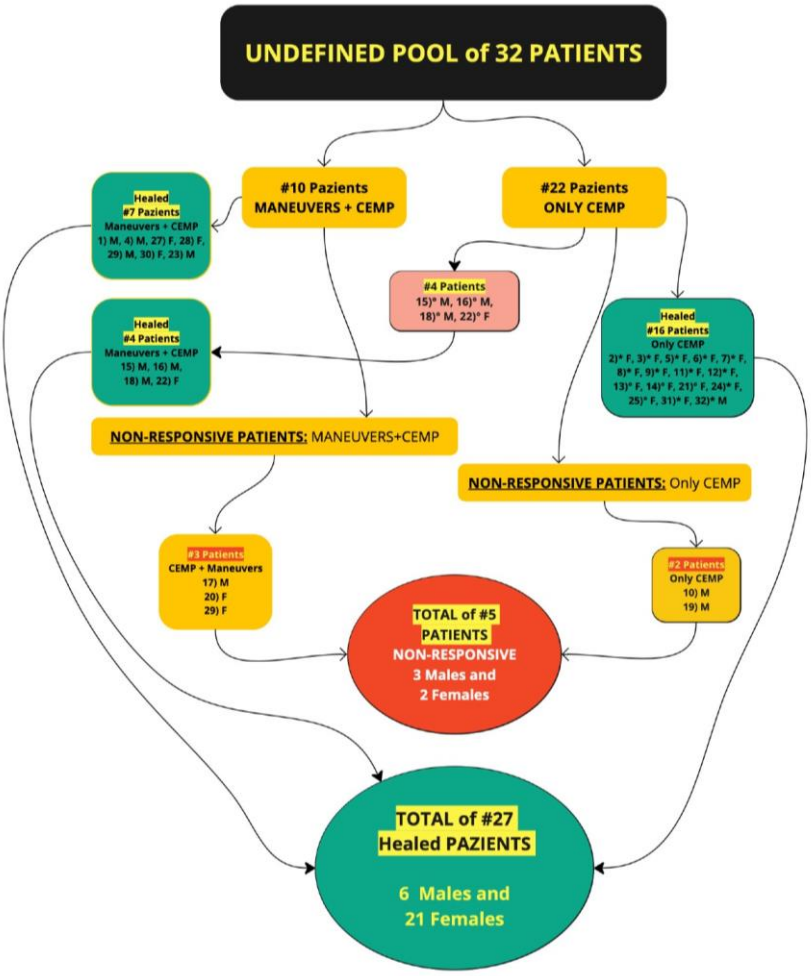

Table 3: Synoptic table of the observational study.

(Table 1)

Demographic Data on Cases Study

Pulsed Magnetotherapy on Cupololithiasis or Canalinolithiasis Therapy

N° of Males	9
N° of Females	23
Total	32
Min. Age	31
Max Age	84
Mean Age	64,2
Mean Age Males	56,8
Mean Age Females	66,7

Grouping by Age	**F**	**%**	**M**	**%**	**Total**	**%**
30 - 40	0	0,0	1	3,1	1	3,1
41 - 50	3	9,4	1	3,1	4	12,5
51 - 60	4	12,5	4	12,5	8	25,0
61 - 70	4	12,5	2	6,3	6	18,8
71 - 80	10	31,3	0	0,0	10	31,3
81 - 90	2	6,3	1	3,1	3	9,4
Total (Check Sum)	23	71,9	9	28,1	32	100,0

(Table 2)

Results on Cases Study

Pulsed Magnetotherapy on Cupololithiasis or Canalinolithiasis Therapy

N° of Males	9
N° of Females	23
Total	32
Initial Group of Only CEMP	22
Initial Group of CEMP + Mai	10
Total	32
Final Group of Only CEMP	18
Final Group of CEMP + Man	14
Total	32

Healed and non-responsi	**F**	**T%**	**F%**	**M**	**T%**	**M%**	**Totale**	**%**
Healed only CEMP	15	46,9	65,2	1	3,1	11,1	16	50,0
Healed CEMP + Maneuvres	5	15,6	15,6	6	18,8	18,8	11	34,4
Non responsive CEMP	0	0,0	0,0	2	6,3	22,2	2	6,3
Non responsive CEMP + Mai	2	6,3	8,7	1	3,1	11,1	3	9,4
	22	68,8		10	31,3		32	100

Where:
T% represents the percentage related to the total patient pool,
F% the percentage related to the total number of female patients,
M% the percentage related to the total number of male patients, and

CONCLUSIONS

While pulsed magnetotherapy (CEMP)[15,16,17,18,19,20] may not yet be considered the gold standard in the treatment of labyrinthine lithiasis, the results from this study, particularly the 12 cases—plus the pilot case—that responded exclusively to CEMP in the first session, provide promising evidence for its efficacy. This is noteworthy considering that prior literature only documented the use of static magnetic fields in treating nonspecific dizziness within a non-specialist context.[21] In continued clinical practice at the Experimental Vestibology Clinic of UNISED University in Corsico (MI), the effectiveness of CEMP as observed in this study has been consistently reaffirmed.

Our analysis indicates that resistance to CEMP often underlies issues that transcend vestibular dysfunction, pointing to broader pathological conditions that warrant further investigation through advanced diagnostic tests such as dynamic TSA Doppler ultrasound, electronystagmography with roto-acceleratory and/or caloric tests, and MRI of the brainstem and cervical spine.

In resistant cases, symptoms often shift from clearly positional vertigo to a form of dizziness that, in one instance, was alleviated by administering a clathrate form of coenzyme Q10 (QTER). This suggests that in certain patients, mitochondrial dysfunction might play a role, necessitating a targeted intervention to overcome what could be described as a "magnetic shock" to cellular energy production.

Thus, CEMP not only serves as a therapeutic tool but also as a diagnostic discriminator, capable of differentiating routine cases of BPPV from more complex conditions that require multi-disciplinary management, including those involving mitochondrial pathology affecting the respiratory chain. Another significant factor contributing to resistance to CEMP is persistent hyperglycemia, as indicated by elevated glycated hemoglobin levels.

The findings from this observational study call for a reasoned interpretation, in line with the philosophical and scientific rigor of W. Leibniz, balancing induction and deduction.[8] However, delving deeper into these theoretical considerations lies beyond the scope of this study; we therefore refer to the comprehensive scientific literature of Professor Franco Bistolfi.[22]

Two key conclusions emerge: first, the clinical utility of applying Weber and Fechner's law to guide the timing and dosage of energy therapy is evident. Second, the interaction between different types of energy, such as the pulsed magnetic field and radiofrequency, can be both destructive and constructive.[23] For instance, in Case 14, radiofrequency therapy appeared to overcome a therapeutic block induced by prior resistance to CEMP, while in Case 20, laser and radiofrequency treatments com-

promised the clinical outcomes achieved by CEMP in treating cupulolithiasis. These observations suggest that, in clinical practice, it is prudent to avoid the concurrent use of other physical therapies in adjacent contexts to prevent interference with the therapeutic effects of CEMP.

From a practical standpoint, it is crucial to maintain certain precautions. Before abandoning a previously effective therapy, it may be beneficial to "unblock" the patient by using an alternative form of energy within the NON-IONIZING RADIATION range, but with a higher frequency as observed by Spaggiari/Pisano. This unblocking effect has been noted in other cases of cupulolithiasis; however, to establish this mechanism as a reliable therapeutic approach, further observations and studies are needed.

In our continued clinical activities at the Experimental Vestibology Clinic of UNISED University, beyond the time frame of this study, we have confirmed the effectiveness of radiofrequency in unblocking resistance to CEMP. We emphasize that moving beyond strict protocol logic allows for deeper analysis of the dynamics at play, a possibility unique to observational studies. This approach can be described in terms of serendipity.

In summary, we propose that there is a quantum leap in the conceptualization of a therapy that implies "action at a distance," such as that facilitated by a pulsed magnetic field (CEMP). The physical dimensions of Entropy and Enthalpy, particularly the concept of the "entropic quantum," serve as natural minima in this context, using Aristotelian terminology. The result is a clinical vision supported by quantum medicine[24], situated within a philosophical and scientific framework. This framework, by its very nature, operates within the "Terrain" (the human biological soil), reflecting the coherence domains that constitute the human body, at the intersection of biochemistry and quantum biophysics.[14]

Ultimately, philosophy and science are never separate, as the philosopher of science E. Laszlo asserts: the matrix of the universe lies in the union of energy and information.[25]

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