A review on concept of potentization in homoeopathy with physiochemical properties and other molecular structure.

Una revisión del concepto de potenciación en homeopatía con propiedades fisicoquímicas y otras estructuras moleculares.

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ABSTRACT

Objectives: Through this review assessing the physiochemical properties of potentised homoeopathic medicines by use of certain equipment's and basic theories by various literature sources.

Methods: Summarized the results from the various experimental areas previously introduced, extracting the general findings and trends and also summarized the results in terms of specific research topics: aging, medium used for potentization, sample volume, temperature, material of potentization vessel, and, finally, the use of molecules to probe homeopathic samples.

Results: There are number of variations has been recorded in the physiochemical properties of homoeopathic medicines by the application of various equipment's and laboratory tools in terms of potentization.

Conclusions: The field requires further targeted experimentation to validate past findings reporting differences between homeopathic dilutions and controls, and to expand these findings by specifically testing the three main working hypotheses that are currently at hand.

Keywords: Physiochemical, potentization, dilutions, nanoparticles

RESULTADOS

Objetivos: A través de esta revisión, evaluar las propiedades fisicoquímicas de medicamentos homeopáticos potenciados mediante el uso de ciertos equipos y teorías básicas de diversas fuentes bibliográficas.

Métodos: resumió los resultados de las diversas áreas experimentales previamente presentadas, extrajo los hallazgos y tendencias generales y también resumió los resultados en términos de temas de investigación específicos: envejecimiento, medio utilizado para la potenciación, volumen de muestra, temperatura, material del recipiente de potenciación y, finalmente, el uso de moléculas para probar muestras homeopáticas.

Resultados: Se ha registrado una serie de variaciones en las propiedades fisicoquímicas de los medicamentos homeopáticos por la aplicación de diversos equipos y herramientas de laboratorio en términos de potenciación.

Conclusiones: El campo requiere más experimentación específica para validar los hallazgos anteriores que informan diferencias entre las diluciones homeopáticas y los controles, y para expandir estos hallazgos probando específicamente las tres hipótesis de trabajo principales que están disponibles actualmente.

Palabras clave: Fisioquímica, potenciación, diluciones, nanopartículas

INTRODUCTION

In Homeopathy, pulverizing and succusion are engaged with the course of potentization. Samuel Hahnemann's revelation of potentization gives homeopathy a one of a kind personality. This was not an incidental revelation, for example, that of gravitational power by Isaac Newton. We know since potentization is a milestone throughout the entire existence of remedial medication. A nearby investigation of Hahnemann uncovers that this revelation was the result of a continuous bit by bit process that started in 1797. He portrayed his experience of treating a patient experiencing stomach colic with the medication Veratrum collection in grain portions. Hahnemann endorsed the medication powder containing 4 grains day by day for 4 days, yet all the same the patient took all the medication in 2 days.^[1] Very in no time, the patient encountered a hazardous disturbance of his condition. This experience prepared for limiting the amount of medicine endorsed to patients during the 1801 pandemic of red fever in Germany. Hahnemann endorsed one drop of weakened Belladonna as a portion containing, in each drop, five millionth amount of a grain. By endorsing something similar portion, he accomplished astounding outcomes in the fix and counteraction of red fever. Hahnemann proceeded with his analyses with different drugs also, for example, Ignatia (1/1,200,000); Veratrum collection (1/4,800,000); Nux Vomica (1/1,200,000 to1/2,400,000); Pulsatilla (1/80,000); Capsicum (1/1,200,000); Chamomilla (1/85,000,000 to 1/3,840,000,000); Cocculus (1/3,600,000); Belladonna (1/120,000); Drosera (1/200,000); Hyoscyamus (1/100,000,000).[2]

The successin powerful treatment utilizing high weakening encourage aged Hahnemann to find, after 10 years, the course of potentization of medications dependent on the centesimal scale. Having found the hypothesis of potentization, Hahnemann began involving 30C intensity for directing medication demonstrating tests furthermore for treating patients. Potentization is an interaction where therapeutic substances are pulverized or succussed in the medium of sugar or milk or 90% ethyl liquor in a particular proportion: that is, 1:99 in centesimal scale and 1:9 in decimal scale. A demonstrating explore was performed ideally with 30C potency.³ In his last long periods of life, Hahnemann found a completely new scale: the LM scale, in light of 1:50,000 weakening, which ranges from LM1 to LM30.^[4]

As he couldn't experimentally validate the cycle of drug readiness and the helpful activity of homeopathic potencies, Hahnemann proposed a thinking that he called a 'conjecture' (being dubious). Hahnemann proposed a speculation. That, during the time spent potentization, there could be development of stowed away 'unique powers' of the medication substance. Further, he saw that these unique powers of the intensity Might follow up on the 'crucial power' of the patient in its healing activity. Indeed, even today most homeopaths think that it is hard to eliminate themselves from this speculative assertion of Hahnemann. The theory of Avogadro, proposed in 1811, characterizes the Number of particles in a single mole of any substance as equivalent to 6.022 1023. The term 'Avogadro's number' was first utilized by French physicist Jean Baptiste Perrin in 1909. The exact Judgments of Avogadro's number happened solely after the American physicist Robert Millikan estimated the charge of an electron. In the underlying times of potentization, Hahnemann restricted the utilization of potencies to 30C or less, contending that there was no chance of any restorative substance in potencies past it, however later he endorsed the exploratory proof of his supporters and consented to utilize potencies higher than 30C. It has now become certain that the strategy for drug preparation in homeopathy (potentisation) is exceptionally near the cutting-edge strategy for crushing and processing utilized in nanotechnology to produce nanoparticles (NPs). Certifying the discoveries of others, [5-14] the creator has shown the nano-particulate nature of homeopathic super high weakening in all the ordinarily utilized potencies. [15-20]

His review was directed with different homeopathic drugs, got from plants, metals, minerals and nosodes. The presence of unique medication substance in the structure of NPs in high potencies of metallic and mineral medications may help to address the essential inquiry of how homeopathic medication arrangements can deliver remedial activity. In this way, the nanopharmacological helpful capacity of homeopathic super high weakening is exceptionally pertinent and substantial.

These discoveries require the following period of more profound enquiry into the remedial action of NPs in the unpretentious and complex natural arrangement of people and different life forms. Logical proof is gathering that homeopathic medications can start an assortment of changes in the hereditary system. [21–45] For instance, Samadder et al have over and over detailed the guideline of quality articulation by potentised homeopathic medications: for instance, they noticed that Lycopodium clavatum 5C-15C has against disease impact on HeLa cells in vitro. Another concentrate by Mondal et al implicated DNA connection in apoptosis actuated by Conium maculatum through age of responsive oxygen species. And at al have likewise detailed that homeopathic high potencies of Hydrastis Canadensis and Marsdenia cundurango can modify quality articulation profiles in HeLa cells in vitro. Daset al have shown that Arsenicum collection 30C regulates protein biomarkers and quality articulations in the yeast Saccharomyces cerevisiae after its openness to arsenite. Olsen seen that super high weakening of Sodium butyrate could instigate quality articulation in HEK 293 cells.

BACKGROUND OF POTENTIZATION

Assuming that we glance back at the historical backdrop of potentization, it should be noticed that Dr. Hahnemann utilized tiny portion of the colour of Quinine (Cinchona officinalis) also thusly Belladonna and different medications also continued to decrease the amount to a drop and then, at that point, decreased it by further weakening it with water. To diminish the physiological impacts of the portion, he proceeded with the weakening and furthermore utilized the course of fiery shaking, which at last transformed into a deliberate course of potentization or dynamization. In 1814, he utilized enthusiastic shaking of the jug containing the medication substance and a vehicle for 3 min. In 1818, he did the pulverizing for the first time. [3] In 1821, he closed to do succussions by giving ten strokes to the jug utilizing the full strength of the arm. [3] In 1825, Dr. Hahnemann started seeing homeopathic prescriptions as dynamized or then again potentized as most likely the portion became minuscule. In 1837, he proceeded with ten strokes process, apparently by hands. [4, 5] Dr. Hahnemann had characterized potentization as "This striking change of the properties of normal bodies through the mechanical activity of pulverizing and succussion on their particles. (While these particles are diffused in an idle dry or fluid substance) fosters the idle unique powers already intangible and figuratively speaking lying stowed away sleeping in them." [6] Strong shaking later every weakening is needed to hold the action of the first specialist; photons are engaged with the transmission of data, and photon-engrossing constructions that reemit photons in explicit ways are involved. Dr. Hahnemann performed dynamization or potentization of meds by an exact number of shakings (succussions) or strokes in given time groupings or by a precise number of pulverizing's of the therapeutic substance that was liberated from every single coarse material. Such high weakening was then, at that point, potentized (dynamized) by rehashed strokes. Dr. Hahnemann utilized high potencies which he accomplished by dynamizing with careful number of strokes. Dr. Hahnemann said that the progressive strokes against hard, flexible body to each vial containing one drop of the lower intensity with 99 drops of liquor (vehicle) to acquire solid potencies are tremendously more powerful than giving a couple nerveless progressive strokes, which will deliver minimal more than weakening, which should not to be the case.

SIGNIFICANCE OF FORCE PARAMETERS

Potentization has all the earmarks of being a cycle, which initiates organic action of the source material through physicochemical changes, produced by sequential utilization of specific quantum of power. At this point, there is no sufficient clearness about the nature of the specific change occurring through the interaction of potentization. In any case, what is processable is the quantum of applied power, which can be evaluated and normalized for each medication utilized for logical investigation just as for clinical application.

The fundamental part of potentization is to apply specific power on the restorative substance blended in with vehicle. The power conferred may be delivering breaking down or enactment of the particles of the source material, regarding which we don't have lucidity. The new examination has shown the presence of nanoparticles [10] seen in the potentized drugs, which are giving off an impression of being coming about because of the power applied on the medication vials. Another hypothesis is about atomic engraving and ionization through the course of potentization. Researchers have led the investigations to gauge the molecule size of a couple of Homeopathy medications. An overall numerical articulation of the structure y = hatchet – n has been inferred which relates the size of nanoparticles (y) with the relating potencies (x). [8] The impact of potentization of the hydrophilic homeopathic medication Cuprum metallicum on the stage profile of the liposomal film was concentrated by Ghosh et al. [9] It can likewise consistently be assumed that the initiation of the remedial properties would rely upon how much power the restorative substance is presented to, making it basic that we measure and normalize the power applied to each medication hence potentized.

PHYSIOCHEMICAL PROPERTIES OF HOMOEOPATHIC MEDICINES

In the past two pieces of this survey, we found promising exploratory proof supporting that homeopathic weakening have physicochemical properties not the same as suitable controls. [10,11] However, not knowing the method of activity through which homeopathy may work leads to a major hindrance for examination into this clinical treatment strategy. A few speculations have been proposed to clarify the preclinical and clinical impacts of homeopathic arrangements; in any case, predictable exploratory proof to back those speculations has been missing up to this point (see audits by Bellaviteet al. [12, 13] and Guedes et al. [14]). Any clarifications of the particular treatment impacts incited by homeopathic medications would have to cover two regions: the drug method of action3 and the pharmacological method of action. [13] The last option would have to respond to the fundamental inquiry of pharmacodynamics, that is, how homeopathic cures work in residing organic entities, though the previous would focus on the topic of the impacts at a physicochemical level. With regards to our deliberate audit of physicochemical investigations, [10, 11] we considered it helpful to relate the experimental outcomes we recognized to some as of late talked about speculations for the drug (physicochemical) method of activity of homeopathic cures. Not monitoring a new methodical survey of the hypotheses of how homeopathy deals with a physicochemical level, we allude to Bellavite et al.,3 who distinguished three significant theoretical ways to deal with conceivably clarify explicit cure impacts of homeopathic arrangements: the development of (1) water groups or clathrates, (2) sound spaces, and (3) nanoparticles from the first substance.3 Water groups—clathrates—were proposed as the method of activity of homeopathic remedies. [6,7] Around atoms of the unique substance, shells of water atoms are relied upon to be framed, reflecting the state of these particles. It was conjectured that these shells could get by and self-repeat regardless of whether the shaping particles were weakened away during the potentization process. These shells were theorized to fill in as a data transporter of the first atoms, which could be interpreted by receptors on cell surfaces. The Quantum Coherence Domains (QCD) hypothesis was created by Preparata and Del Giudice et al.[18,19] This hypothesis predicts the arrangement of stable water locales or spaces in water, which—via conveying some data connected with the material potentized—could clarify explicit cure properties of homeopathic arrangements. A full depiction of this hypothesis is given somewhere else.

FACTS ABOUT HIGHER DILUTION IN HOMOEOPATHY

The physical science and science of high weakening paired or ternary combinations are exceptionally confounded what's more a few hypothetical and trial studies had as of now been completed to comprehend the baffling conduct of such blends [19, 20]. In planning high weakened Homeopathic medication (Homed), utilized weakening interaction, (otherwise called "dynamization" or "potentization") is a process in which a modest quantity of the solute or a fluid restorative substance is weakened inside a lot of liquor or refined water medium. The combination is energetically shaken in an interaction called "succussion" which has all the earmarks of being identical to thorough mechanical fomentation used to create Nano-particles of strong materials [24]. It is notable that this interaction is exceptionally fundamental and without embracing such a dynamization cycle, homed

can't gain the mending power or action (intensity). At last unique higher strength combinations are created. Nonetheless, homed utilized by homeopaths are for the most part weakened to that degree where they could contain no particles of the first substance. As indicated by the author Father of homeopathy, Samuel Hahnemann (1755–1843), the course of progression actuates the "essential energy" of the weakened substance, and that progressive weakening's increment the "strength" of the arrangement. Be that as it may, the solutions to the inquiries why and how it happens have not been explained up to this point [21, 22]. This is on the grounds that, at such a low weakening, no atom or Nano-particles of the first restorative material is probably going to be available. Also, it has not yet been tentatively affirmed. In any case, metallic or strong Nano-particles from the mass of the holder which may be available in the weakened medication are not viewed as dynamic for relieving an illness. Along these lines, how weakened Homed takes care of business (or fix sicknesses) is an unavoidable issue. Besides, a more weaken Homed shows a higher intensity, and likewise viewed as more grounded and more profound acting. The final result is frequently weakened that it is undefined from the host dilatants (unadulterated water, sugar or liquor) as currently referenced. Accordingly, in more weakened Homed, the movement of the medication is hard to clarify. Questions additionally emerge in regards to various restoring abilities of the Homed. It is additionally taken note that occasionally a Homed fix an infection exceptionally speedy and in a few different cases, the relieving process is so sluggishly that it is hard to keep confidence in Homed. There are no convincing clarifications of all such questions connected with the relieving system of any regular high weakened Homed (for example there is no logical clarification of "why and how a Homed function in human body"). The current situation is to such an extent that Homed is utilized by the individuals who have confidence in it, and those that sell it. Hahnemann trusted that the dynamization or shaking of the arrangement utilized for getting ready Homed caused a "soul like" mending power to be let out of inside the substance. Indeed, however the Homed are frequently amazingly weakened, homeopaths consider the presence of a mending power in these homeopathic arrangements. Allies of homeopathy have additionally proposed one more idea of "Water Memory", as per which water "recalls" the substances blended in it, and sends the impacts of those substances when burned-through [23]. This idea is conflicting with the ebb and flow comprehension of issue, and water memory has never been shown to have any perceivable organic or then again other impact. The genuine memory of water or other fluid was estimated tentatively and was viewed as around 10-14 -10-15 seconds. Numerous materials have practically such memory or better. Accordingly, the case of "water memory" can't be upheld tentatively.

METHODS

Summarized the results from the various experimental areas previously introduced, extracting the general findings and trends and also summarized the results in terms of specific research topics: aging, medium used for potentization, sample volume, temperature, material of potentization vessel, and, finally, the use of molecules to probe homeopathic samples.

All the articles were collected from database like google scholar by using key words like potentization in homoeopathy, logistic view of potentization in homoeopathy from different journal source. (Please see table. no.1.)

DISCUSSION

From Hahnemann's initially proposed 'dynamic powers of homeopathic potencies, a few later hypotheses have been created. These incorporate water memories, formulation of clathrates, epitaxy and quantum physical aspects. Every one of which depends on the unique idea of potencies. The silica hypothesis is diverse in that it proposes the likelihood that silicon NPs, siphoning from the crystal, go about as the remedial specialists of a homeopathic arrangement. Yet, the assortments of helpful activity of homeopathic drugs can't be restricted to just the one kind of NP. The revelation of NPs of the first medication materials by Chikramane et al in six metallic homeopathic medications of 6C, 30C and 200C opened another time of investigation into the substance of super high dilutions.5 However, in approving the homeopathic potencies based on their

disclosures, Chikramane et al endeavored to clarify their discoveries exclusively inside the restrictions of Avogadro's number, which has limited the extent of enquiries past that cutoff. The essential idea of homeopathy remains on the strength of homeopathic medication demonstrating tests. These analyses, on sound individuals, produce signs and manifestations that vanish with the withdrawal of the drug. The discoveries of Khuda-Bukhsh et al appear as applicable in the medication demonstrating setting as they do in clarifying the remedial activity of homeopathic potencies. As the homeopathic medications appear to be capable of starting epigenetic changes in the patients that are therapeudic, the equivalent might start transient epigenetic modifications during a medication demonstrating test. The revelation of prompt early qualities (IEGs) may help in conceptualizing the science behind such impacts. The absolute number of IEGs is thought to be near 100, just not many of which have been broadly described. The statement of IEGs (for example c-fos, c-jun, bend) happens quickly and momentarily on openness to incited pressure furthermore a wide assortment of cell upgrades. The outflow of IEGs is low or imperceptible in quiet cells, yet is quickly actuated at the transcriptional level not long after extracellular stimulation; this transcriptional acceptance is autonomous of new protein synthesis. These revelations offer a new testable speculation on homeopathic medication demonstrating.

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Table. no.1. Summarise various review on Medicinal properties of Different Homoeopathic Medicines at various Potencies with the help of different tools.

S.NO.	Name of authors	Year of publication	Name of journal	Title of study	Tools used/equipment's	Medicines / potency	Conclusion	References
1.	Papiya Nandy	2015	IJRH (Indian Journal of Research in Homoeopathy)	A review of Basic Research on Homoeopathy from a physicist's point of view	Ultraviolet-visible Spectroscopy, Fourier Transform Infrared Radiation (FTIR) spectra,	C. metallicum, A. napellus	It has been shown that with an increase in potency the drug particle size decreases achieving nano-dimension. Konovalov has concluded that nanoassociate formation is a clue to understanding the behavior of highly diluted aqueous solution	25
2.	Niranjan B. Joshi1 , Tejas P. Gosavi2 , Manisha P. Gajendragadkar3 , Amit D. Kandhare4 , Tanveer A. Khan5	2021	Turkish Journal of Physiotherapy and Rehabilitation	DEVELOPING AN APPLICATION OF RAMAN SPECTROSCOPY IN HOMOEOPATHIC PHARMACEUTICAL ANALYSIS OF BARYTA MURIATICUM	Raman Spectroscopy	The homoeopathic formulations of Baryta Muriaticum viz., 3X, 6X and 12X were prepared according to guidelines set by Indian Homeopathic Pharmacopeia	This review reasoned that Raman vibrational spectroscopy is a touchy and viable application in distinguishing fluctuation among different homeopathic trituarations of Baryta Muriaticum and in this way accommodating method in normalization and approval of homeopathic medications	26
3	Tejas P. Gosavia , Pinaki Ghoshb , V. S. Gholec , S. L. Bodhankarb	2011	Pharmacologyonline	Comparative Study of Ultra Molecular Homeopathic Dilutions and Potentised Preparations by UV Spectroscopy in Relation with Beer's Law	UV spectrophotometric analysis	30c, 200c,1000c (1M) of Conium maculatum, Argentum metallicum, Tarentula hispanica	In traditional medication centralization of medication substance is as indicated by Brew's law, on the opposite homeopathic potencies shows nonlinear peculiarities at 210nm when contrasted with sequential weakenings of same medications and apportioning liquor as a standard control	27
4.	Rajendra Prakash Upadhyay1, Chaturbhuja Nayak2	2011	Int J High Dilution Res	Homeopathy emerging as nanomedicine	Trace element analyses for silicon, SEM, TEM Analysis	Colchicum, Pulsatilla and Belladonna	As different types of silica are known to interface with proteins and cells of the safe framework, these nanoparticles (alongside the interfacial water on their	28

5.	Michel Van	2021; 20	International	Particle	Nano tracking	Lactose C, Cuprum	surface) may likewise go about as transporters of this data to the objective. The "size" of data may be connected with the weakening level of meds. Under such potential conditions, homeopathy qualifies as a nanomedicine framework not needing high innovation. The beginning material and	29
J.	Wassenhoven1*, Martine Goyens2, Pierre Dorfman3, Philippe Devos4	2021, 20	Journal of High Dilution Research	Characterisation of Traditional Homeopathically Manufactured Medicine Cuprum metallicum and Controls	analysis (NTA)	metallicum C & simply diluted	weakening/dynamization technique impact the nature and grouping of these NPs. Further estimations are required on other natural substances utilizing similar controls (dissolvable and just Weakened assembling lines) to help these discoveries.	23
6.	Barbara Marschollek1, Mathias Nelle2,*, Martin Wolf1, Stephan Baumgartner1,3, Peter Heusser1, and Ursula Wolf1	2010	TheScientificWorld JOURNAL	Effects of Exposure to Physical Factors on Homeopathic Preparations as Determined by Ultraviolet Light Spectroscopy	ultraviolet (UV) spectroscopy	Homeopathic arrangements of CuSO4 were created in fluid stage as c arrangements (i.e., centesimal, 100-crease weakening with each move forward) to 30c. Homeopathic arrangements of S8 were created in fluid Stage as x potencies (i.e., decimal, 10-crease weakening), beginning with S8 6x. Since S8 isn't dissolvable in water,	The discoveries of this review show that openness to outer variables might influence homeopathic Arrangements. The lower transmission esteems might show that the diluent is less organized or more powerful later homeopathic potentization and that higher intermolecular energy is held after openness to physical Factors. Further examination on this subject is exceptionally attractive.	30

						1x to 5x of S8 were ready as pulverizings, utilizing lactose.		
7.	Scott Marsh- Brown	2016	Dissertation	A Comparative Study of the NMR Spectra of Sulphur 12CH prepared using Hahnemannian method and Sonication	Kruskal-Wallis method, NMR	Sulphur 12CH	As far as the CH2 top substance shift esteems it very well may be presumed that particular similitudes exist between 12c power level of Sulfur created by Hahnemannian hand succussion and sonication, and that the two strategies for disturbance produce comparative primary properties in examples of the 12c strength Level. Moreover as far as the synthetic shift esteems, succussion and sonication foster cures that are particular from unagitated cures of Comparable intensity level. In this way, these discoveries support the utilization of sonication as a possibly suitable choice to hand succussion as a technique for unsettling in The potentization interaction.	31
8.	Claudia Scherra,c Stephan Baumgartnera,b Jörg Sprangerc,e Meinhard Simond	2006	Forsch Komplementärmed	Effects of Potentised Substances on Growth Kinetics of Saccharomyces cerevisiae and Schizosaccharomyces pombe	photometrically	potentised substances or water controls	Both yeast species responded to certain potentised substances by evolving their development energy	32
9.	E S Rajendran	2017	Saudi Journal of Medical and Pharmaceutical Sciences	Nano Pharmacological Aspect of Homeopathic Drugs -	HRTEM	Natrum Muriaticum 6C – CM and LM1 - LM30	A relative investigation of the molecule size of LM scale and centesimal scale shows that NPs in LM	33

			A Comparative Study of Different Scales of Ultra-High Dilutions Based on HRTEM Analysis and NP Characterization of Homeopathic Drug Natrum Muriaticum 6C – CM and LM1 - LM30	scale are a lot more modest than the NPs in centesimal scale.
10	E. S. Rajendran1 2018	Homeopathy	Homeopathy Seen as Personalised Nanomedicine	Among every one of the disclosures of Hahnemann, potentisation was the most significant, however disputable. The remedial impact of individualized homeopathic potencies is experimental however baffling by the ordinary standards of science. This Catch 22 is a profoundly disagreeable subject of discussion among realists and homeopaths. Later revelations connecting with the nanoparticulate nature of homeopathic super high potencies what's more their expected impact on individual quality articulation give new bits of knowledge into this Complex issue. It is inferred that homeopathy might be seen as 'customized nanomedicine'.