Impact of forbidden foodstuffs on the efficacy of homoeopathic medicines: An in vitro evaluation

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Abstract

Background: In previous screening experiment, out of some homoeopathic medicines in 30 and 200 potencies Mezereum 200 showed maximum inhibition to growth of Candida albicans on comparing the ‘Zone of Inhibition’ in culture plates treated with homoeopathic medicines keeping standard antifungal Ketoconazole, rectified spirit and distilled water as control by using Disc method. Objective: To observe the impact of various forbidden edible items such as garlic, onion, cardamom, clove, caraway, ginger, fenugreek, black pepper, asafoetida, red chilli, green chilli, turmeric, lemon and camphor on the efficacy of Mezereum 200 in the inhibition of growth of human pathogenic fungus C. albicans.

Materials: Isolation of human pathogenic fungus: Sample collected from patients suffering from oral ulcers was incubated for 15 days at 37±1°C for growth of fungus, if any. The growth of Candida albicans was obtained. Preparation of prohibited items: 500 mg of fine powdered prohibited items were dissolved/mixed in 5 ml distilled water. 5 μl of autoclaved solution of each item was mixed with 5 μl of Mezereum 200.

Method: Disc method was used to assess the impact of prohibited items on the efficacy of homoeopathic medicine Mezereum 200 in in-vitro conditions against Candida albicans by “Inhibition Zone Technique”. Result: The result of this in-vitro experiment has shown that there is no inhibitory effect of prohibited items in question on Mezereum 200 in causing inhibition to growth of Candida albicans. Conclusion: It is evident from this experiment that there is no interference of prohibited items on the action of homoeopathic medicine.

Keywords: Candida albicans, Disc method, Mezereum, In vitro inhibitory effect, Garlic, Onion, Inhibition zone technique

INTRODUCTION

Homoeopathy has been the hot subject of debate in the scientific parlance with respect to the efficacy of potentised preparations.1-5 This is a system of medicine that has been in widespread use for the last 200 years, the theory of which is diametrically opposed to modern pharmaceutical knowledge and theories6-8 because the fundamental tenets of Homoeopathy are completely different from modern medicine, pharmacology and chemistry.9-11 Main sources of contention include the implausibility of homoeopathic principles, the lack of a proven or plausible mechanism of action for Homoeopathy and mixed results from randomised controlled trials on homoeopathic preparations. These conflicts coupled with the existence of some high-quality trials that did not show a benefit with Homoeopathy have caused many to conclude that Homoeopathy is nothing more than quackery.12-13 Over and above, the restriction of certain edible food stuff/items by homoeopathic physicians on flimsy grounds that these stuffs neutralise the effect of medicine caused repulsive impact in the mind of public about Homoeopathy. These restrictions are being passed from one generation of homoeopathic physician to the other without even trying to explore any possible scientific reason behind it, thus putting a big question mark on its efficacy.

In previous experimental research work entitled ‘Anti-candidal activity of homoeopathic drugs: An in vitro evaluation,’ effect of some homoeopathic medicines (namely, Acid benzoicum, Apis mellifica, Graphites, Kali iodatum, Mezereum, Petroleum, Sepia, Silicea, Sulphur, Sulphur iodatum, Tellurium, Thuja occidentalis) in 30 and 200 potencies against human pathogenic Candida albicans by comparing the ‘Zone of Inhibition’ for growth of the fungus in culture plates treated...
with potentised medicines and with standard antifungal drug, Ketoconazole (Positive control), rectified spirit (vehicle) and distilled water as control using Disc method were screened. Among different drug potencies having given a positive response, *Mezereum 200* showed maximum inhibition of growth confirming its definite inhibitory activity against *C. albicans*.[13]

It has been propagated since inception of Homoeopathy that certain edible items (namely, garlic, onion, cardamom, clove, caraway, ginger etc.) neutralise the action of homoeopathic medicines. Majority of homoeopathic physicians used to prohibit intake of these items during homoeopathic treatment without any scientific reasons. This gave us a point to ponder whether restriction of these items during homoeopathic treatment is merely arbitrary/whimsical or has any scientific basis. It was a matter of concern that whether these forbidden items actually neutralise the action of homoeopathic medicines or it is just a myth? There was also a big question that, could by any means, such phenomenon, if any, be proved on human subjects?

To observe whether these forbidden items are capable of neutralising the action of homoeopathic medicines or not, an *in vitro* experiment was planned and conducted in the Medical Mycology Laboratory of Gaurang Clinic and Centre for Homoeopathic Research (GCCHR) based at Lucknow. In this experiment, the effect of certain prohibited edible items alone (namely, garlic, onion, cardamom, clove, caraway, ginger, fenugreek, black pepper, asafoetida, red chilli, green chilli, turmeric, lemon and camphor) in comparison to impact of these items admixed with *Mezereum 200* keeping *Mezereum 200* and rectified spirit (vehicle) as control was observed for their inhibitory activity on the growth of human pathogenic yeast *C. albicans*.

**Objective**

To observe the impact of various forbidden edible items such as garlic, onion, cardamom, clove, caraway, ginger, fenugreek, black pepper, asafoetida, red chilli, green chilli, turmeric, lemon and camphor on the efficacy of *Mezereum 200* in the inhibition of growth of human pathogenic fungus *C. albicans*.

**Materials and Methods**

**Isolation of human pathogenic fungus**

The samples were collected from the oral cavity of the patients suffering from oral ulcers who came to GCCHR for treatment. Part of the oral swab was examined directly in potassium hydroxide (10%) slide mount. KOH preparation of swab showed fair number of yeast-like cells. For isolation, the rest part of swab was inoculated in petridishes poured with Sabouraud’s Dextrose Agar (SDA) with and without Cycloheximide and Chloramphenicol (HI Media B. No. 9039) incubated at 37+1°C for 72 hours. Microscopic examination of 4 days old culture showed globose, short, ovoid sometimes elongated blastoconidia (3–6 µm) on corn meal agar. Reynold’s–Braude phenomenon was observed by incubating blastoconidia in human serum at 37°C and germination was found to be more than 70%.

Fermentation and assimilation test further confirmed the identity of the species as *C. albicans*. However, for contamination, if any, petridishes poured with SDA in four replicates were exposed to the environment which gave few mycelial fungi dominated by species of *Aspergillus*, but there was no *C. albicans* in the working environment.

**Method of preparation of forbidden foodstuffs**

All the forbidden edible items mentioned above were converted to very fine dry powder (except lemon in which the pulp was first extracted, then dried to remove the moisture content) and weighed 500 mg using electronic balance (CAMRY-Model EHA701: d = 0.01 g) and dissolved/mixed in 5 ml distilled water. This mixture was autoclaved at 15-pound pressure. 5 µl of this autoclaved mixture of each forbidden item was mixed with 5 µl of *Mezereum 200* so that the total mixture was 10 µl.

**Methodology**

Disc method was used to assess the impact of all the forbidden edible items in question on the efficacy of homoeopathic medicine *Mezereum 200* in *in vitro* conditions against human pathogenic *C. albicans* using ‘Inhibition Zone Technique’.[14,15] 20 ml sterilised SDA was plated on 30 sterilised petridishes and allowed to solidify. 1 ml of seeded culture broth was mixed well and poured over the surface of all the petridishes already plated with medium. The discs (12 mm in diameter) of sterilised Whatman No. 1 filter paper dipped in mixture of *Mezereum 200* (5 µl) and every forbidden item (5 µl) were placed on the centre of each petridish separately. Discs soaked in *Mezereum 200* (5 µl) and rectified spirit (vehicle) were kept as control.

Petridishes were then incubated at 37+1°C for 72 hours. The impact of forbidden item on the efficacy of homoeopathic medicine *Mezereum 200* was judged by comparing the zone of inhibition on the growth of *C. albicans* produced by *Mezereum 200* alone to the zone of inhibition produced by *Mezereum 200* admixed with forbidden item. An appreciable reduction in the zone of inhibition by *Mezereum 200* admixed with forbidden item as compared with that of *Mezereum 200* alone was considered as negative impact of the forbidden item on the action of *Mezereum 200*. Similarly, same zone of inhibition was considered as no impact while increase in the same was considered as positive impact on the inhibition in growth of human pathogenic fungus *C. albicans* by *Mezereum 200*.

The experiment was repeated three times and the mean effective area of zone of inhibition was calculated.

**Results**

The results of these experiments have shown that there is no visible effect of forbidden item in question on the inhibition in growth of pathogenic fungus *C. albicans* by homoeopathic
Forbidden items alone did not produce any appreciable zone of inhibition [Table 1 and Figure 1]. The zone of inhibition shown by onion, cardamom, clove, caraway, black pepper, asafoetida, red chilli, green chilli, turmeric, lemon and camphor against C. albicans was 12 mm (equal to disc diameter) similar to rectified spirit (vehicle/control). Ginger and fenugreek showed 13 mm inhibition and garlic 13.5 mm.

The zone produced by Mezereum 200 mixed with these items was almost same as shown by Mezereum 200 alone [Table 2 and Figure 2]. The zone of inhibition shown by garlic (39.72 mm), onion (39.56 mm), caraway (39.26 mm), fenugreek (39.89 mm), red chilli (39.62 mm), green chilli (39.38 mm), lemon (39.86 mm) and camphor (39.17 mm) mixed with Mezereum 200 was slightly more than Mezereum 200 alone while that of cardamom (37.99 mm), clove (35.25 mm), ginger (36.37 mm), black pepper (37.99 mm), asafoetida (35.87 mm) and turmeric (37.77 mm) was slightly less than that Mezereum 200 alone.

### Discussion

Even in the present scientific era of evidence-based medicine where seeing is believing is the main motto majority of homoeopathic physicians, as a tradition, are prohibiting intake of certain edible items during homoeopathic treatment which was started by their predecessors for a reason better known to them. These stereotyped practitioners never bothered to inquire whether there is any scientific basis behind such restrictions. It was also a big question whether, by any means such phenomenon, if any, be proved either in human subjects or in some experimental model. The involvement of psychological factor and number of variables were the main bottleneck behind not conducting such study on human subjects. Moreover, it was also difficult to quantify the amount of forbidden item taken by the subject. Over and above, certain prohibited food item may act as disease-modifying substance.

Thus, to prove or disprove the authenticity of such dietary restrictions, an experiment was planned by the research team to be conducted in the Medical Mycology Laboratory of GCCHR, Lucknow to demonstrate the effect of some frequently prohibited items on the efficacy of homoeopathic medicine, Mezereum 200, on the inhibition in the growth of human pathogenic fungus C. albicans in in vitro biological experimental model.

The results of these experiments have shown that there is no significant effect of these forbidden items on the inhibition in growth of human pathogenic fungus C. albicans by homoeopathic medicine Mezereum 200 in in vitro conditions.

The available literature has evidence of anti-fungal activity of onion, cardamom, clove, caraway, black pepper, asafoetida, turmeric, lemon and camphor and many more edible items in in vitro conditions.

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on the growth of Aspergillus carbonarius, Aspergillus wentii, Aspergillus versicolor, Penicillium brevicaespactum, Penicillium glabrum, Penicillium chrysogenum and Fusarium spp. and an inhibitory effect on A. niger and Penicillium aurantiogriseum.[17]

Pinto et al. in 2009 concluded that clove EO, its main component, eugenol obtained from Syzygium aromaticum has inhibitory activity against Candida, Aspergillus and dermatophyte.[18]

The results of screening by Rabadia et al. in 2011 indicated that EOs of black pepper, cardamom, cumin, boswellia and patcholi inhibited fluconazole-resistant fungal strains in varying degrees of dilutions. EO of Boswellia was found to be the most effective against Candida tropicalis and that of black pepper and cardamom against Trichophyton mentagrophytes.[19]

Dimić et al. in 2009 concluded that caraway extract strongly inhibited the growth of Emericella. nidulans, Penicillium commune and Penicillium implicatum at the concentration of 0.1% and Aspergillus tamarii at the concentration of 0.5% during 7 days of incubation at 25°C. The extract of garlic only partially inhibited the growth of A. tamarii and P. commune but completely inhibited the growth of P. implicatum and E. nidulans at the doses of 0.5 and 1%. Oregano extract partially inhibited all mould species, significantly reducing the growth of colonies, especially E. nidulans.[20]

Omezzine et al. in 2014 evaluated the antifungal activity of methanolic extracts of aerial parts of fenugreek and found it highly active against Fusarium oxysporum f. sp. radicis-lycopersici (FORL) and F. oxysporum f. sp. lycopersici (FOL).[21]

Sitara et al. in 2008 evaluated the antifungal activity of EOs extracted from the seeds of neem, mustard, black cumin and asafoetida at 0.5, 0.1 and 0.15% concentration against eight seed borne fungi namely Aspergillus niger, A. flavus, F. oxysporum, F. moniliforme, F. nivale, F. semitectum, Drechslera hawiensis and Alternaria alternata. Of these oils, Asafoetida oil at 0.1% and 0.15% concentration significantly

Figure 1: Impact of forbidden edible items alone on the growth of Candida albicans in comparison to Mezereum 200 assessed by ‘Inhibition Zone Technique’
inhibited the growth of all test fungi except A. flavus. Black cumin oil at 0.15% was also effective but showed little fungicidal activity against A. niger followed by neem while Mustard oil did not show any fungicidal activity.[22]

Martos et al. in 2008 demonstrated the antifungal activity of EOs of lemon, mandarin, grapefruit and orange on the growth of moulds commonly associated with food spoilage: Aspergillus niger, A. flavus, P. chrysogenum and Penicillium verrucosum, using the agar dilution method.[23]

Li et al. in 2014 demonstrated that the extracts from the xylem parts of camphor plant had antifungal activity against Coriolus versicolor and Gloeophyllum trabeum. Thus, it could provide a renewable source for wood preservatives.[24]

Apisariyakul et al. in 1995 studied antifungal activity of turmeric oil against 15 isolates of dermatophytes. The inhibitory activity of turmeric oil was tested in Trichophyton-induced dermatophytosis in guinea pigs. The results showed that all 15 isolates of dermatophytes could be inhibited by turmeric oil at dilutions of 1:40–1:320. The other four isolates of pathogenic fungi were inhibited by turmeric oil at dilutions of 1:40–1:80. All six isolates of yeasts tested proved to be insensitive to turmeric oil.[25]

Nascimento et al. in 2000 evaluated the antimicrobial activity of plant extracts of yarrow, clove, lemon-balm, basil, guava, pomegranate, rosemary, sage, jambolan, thyme and phytochemicals such as benzoic acid, cinnamic acid,
eugenol and farnesol with antibiotic susceptible and resistant microorganisms. The highest antimicrobial potentials were observed for the extracts of clove and jambolan which inhibited 64.2 and 57.1% of the tested microorganisms respectively. Pseudomonas aeruginosa was inhibited by clove, jambolan, pomegranate and thyme extracts. This inhibition was observed with the individual extracts and when they were used in lower concentrations with ineffective antibiotics.\(^{[28]}\)

The above reports confirm direct effect of garlic, onion, cardamom, clove, caraway, ginger, fenugreek, black pepper, asafoetida, turmeric, lemon and camphor on various pathogenic strains of filamentous fungi but none of the experiment was conducted against yeast-like fungi in general and C. albicans in particular except by Pinto et al. who demonstrated the antifungal activity of clove EO, obtained from Syzygium aromaticum. The EO analysed showed a high content of eugenol (85.3%) while in the present study only 5 \(\mu\)L of crude clove solution was used. It is a matter of further research whether high content of eugenol in clove EO is responsible for the inhibition of germ tube formation by C. albicans.

From time immemorial, extracts isolated from different natural resources especially plants have always been a rich arsenal for controlling fungal infections and spoilage. Due to extensive traditional use of turmeric in food products various researches have been done to study the antifungal activity of turmeric and curcumin. As per available literature, turmeric powder when added in plant tissue culture at concentration of 0.8 and 1.0 g/L had appreciable inhibitory activity against fungal contaminations.\(^{[27]}\) Methanol extract of turmeric showed antifungal activity against Cryptococcus neoformans and C. albicans with MIC value of 128 and 256 \(\mu\)g/mL, respectively,\(^{[29]}\) which again is much higher than concentration of crude turmeric in 5 \(\mu\)L solution.

Since this experiment was planned with an objective to observe whether various forbidden edible items such as garlic, onion, cardamom, clove, caraway, ginger, fenugreek, black pepper, asafoetida, red chilli, green chilli, turmeric, lemon and camphor by any means hinder, neutralise or annihilate the action of Mezereum 200 in inhibiting the growth of human pathogenic fungus C. albicans, the concentration of all items, rectified spirit (vehicle/control) and Mezereum 200, was kept same i.e., 5 \(\mu\)L.

This particular experiment was conducted with yeast-like fungus C. albicans while in almost all the other experiments cited above with reference to edible items were conducted either on pathogenic strains of filamentous fungi or on dermatophytes. It is a matter of research that whether a similar low concentration (5 \(\mu\)L) of forbidden items alone in question by any means inhibit the growth of filamentous fungi too. Moreover, further experiment needs to be conducted to elicit whether much higher concentration of forbidden items alone by any means inhibit the growth of C. albicans. However, both these aspects are beyond the scope of this experimental study.

The outcome of this preliminary effort to observe the effect of various forbidden items on the efficacy of Mezereum 200 in the inhibition of growth of human pathogenic C. albicans boosted our morale to undertake a few more in vitro studies. The other in this series is to study the impact of a few inebriants such as tea, coffee, tobacco and bhang.\(^{[29]}\) Further, in this series, the work on impact of certain allopathic medicines such as antibiotics, steroids and analgesics on the efficacy of homeopathic medicines in in vitro conditions is in progress.

**Conclusion**

The results achieved in this experiment remove the prevailing concept of prohibiting intake of various foodstuffs merely on hypothesis that they neutralise or annihilate the action of homeopathic medicines by some interaction or due to their odour, taste and chemical composition etc. This experiment will also remove the misconception that Homeopathy is nothing but placebo therapy or psychotherapy.

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**Conflicts of interest**

None declared.

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Impact des produits alimentaires interdits sur l’efficacité des médicaments homéopathiques : une évaluation in vitro

Contexte: Lors des expériences de criblage précédentes, parmi certains médicaments homéopathiques 30 ou 200 CH, Mezereum 200 a montré une inhibition maximale du développement de Candida albicans lors de la comparaison avec la ‘Zone d’inhibition’ dans les plaques de culture traitées avec des médicaments homéopathiques tout en gardant l’antifongique standard Ketoconazole, de l’alcool rectifié et de l’eau distillée comme contrôle au moyen de la méthode Disc. Objectif: Cette étude expérimentale in vitro a été conduite dans le laboratoire de mycologie médicale de GCCHR afin d’observer les effets de divers produits alimentaires défendus/interdits durant un traitement homéopathique (Mezereum 200).

Matériels et méthodes: Des échantillons prélevés sur des patients souffrant d’ulcères buccaux ont été incubés pendant 15 jours à 37 + 1˚C pour le développement de champignons, le cas échéant. Des Candida albicans se sont développés. Préparation des produits défendus: 500 mg de produits défendus broyés finement ont été dissous/mélangés à 5 ml d’eau distillée. 5 μl d’une solution de chaque produit stérilisée dans un autoclave ont été mélangés à 5 μl de Mezereum 200. La méthode Disc a été utilisée pour évaluer l’impact des produits défendus sur l’efficacité du médicament homéopathique Mezereum 200 dans des conditions in vitro pour lutter contre le Candida albicans au moyen de la « Technique de la zone d’inhibition ».

Résultat: Les résultats de cette expérience in vitro ont montré qu’il n’y a pas d’effet inhibiteur des produits défendus en question sur Mezereum 200 entraînant l’inhibition du développement de Candida albicans. Conclusion : à partir de cette expérience, il est évident que les produits défendus n’ont aucune incidence sur l’effet d’un médicament homéopathique.

Impacto de los alimentos prohibidos en la eficacia de los medicamentos homeopáticos: una evaluación in-vitro

Fundamento
Con anterioridad, se han realizado experimentos sobre medicamentos homeopáticos en potencias de 30 y 200 en cuanto a la inhibición del crecimiento de Candida albicans. Aplicando el método de disco, se constató que Mezereum 200 mostraba la inhibición máxima del crecimiento de Candida albicans al comparar la “zona de inhibición” entre las placas de cultivo con los medicamentos homeopáticos y las placas de control (con ketoconazol, alcohol rectificado y agua destilada). Este estudio in vitro se efectuó en el laboratorio Medical Mycology del GCCHR para observar el efecto de diferentes alimentos productos prohibidos durante el tratamiento homeopático.

Materiales y métodos
Las muestras recogidas de pacientes con úlceras orales se incubaron durante 15 días a 37+10°C para comprobar si había un crecimiento micótico. Se obtuvo el crecimiento de Candida albicans. Se disolvieron mezclaron 500 mg de productos prohibidos en polvo fino en 5 ml de agua destilada.

5 μl de solución de autoclave de cada producto se mezcló con 5 μl de Mezereum 200. Se aplicó el método de disco para evaluar el impacto de los productos prohibidos en la eficacia del medicamento homeopático Mezereum 200 en condiciones invitro frente a Candida albicans a la “técnica de la zona de inhibición”.

Resultados
El resultado de este experimento in vitro ha mostrado que los correspondientes productos prohibidos no tuvieron efectos inhibidores en la eficacia de Mezereum 200 en provocar la inhibición del crecimiento de Candida albicans.

Conclusiones
En este experimento, se ha evidenciado que no hay interferencia por parte de los productos prohibidos en la acción del medicamento homeopático.
Auswirkungen verbotener Lebensmittel auf die Wirksamkeit homöopathischer Arzneimittel: Eine In-vitro-Bewertung


Ziel: Diese experimentelle In-vitro-Studie wurde im Labor für medizinische Mykologie durchgeführt von GCCHR, um die Wirkung verschiedener während der homöopathischen Behandlung verbotener / verbotener Substanzen (Mezereum 200) zu beobachten.


Ergebnisse: Das Ergebnis dieses In-vitro-Experiments hat gezeigt, dass es keine hemmende Wirkung von verbotenen Substanzen auf Mezereum 200 gibt, die eine Hemmung des Wachstums von Candida albicans verursachen.

Schlussfolgerung: Aus diesem Experiment geht hervor, dass keine verbotenen Gegenstände auf die Wirkung der homöopathischen Medizin einwirken.