

Homeopathy for Acute Viral Infections: A Bayesian Repertory for Reliable Use of Common Symptoms

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Abstract

A recent worldwide COVID-19 case collection assessed the prevalence and likelihood ratio (LR) of symptoms, resulting in a bayesian repertory and repertorization app. This approach resulted in a clear and reliable differentiation between selected medicines, with common symptoms, combined or separately. The assessed COVID-19 symptoms are mostly common symptoms and occur in several other acute viral infections. Common symptoms are symptoms, throughout the body, common to most viral infectious disease, for example, fever, headache, weakness, etc. Use of this repertory and app is likely to improve the effectiveness of homeopathy in these infections due to the hierarchical approach built within the app to categorize the unique combination of common symptoms specific to each case. The use of the online app is free of charge. This offers an opportunity to experience the usefulness of common symptoms with the bayesian approach in case evaluation. This repertory could be a showcase of homeopathic treatment based on systematic and reproducible data collection. We invite practitioners to test the app in daily practice while treating acute viral infections and give feedback via the new button at the last screen of the app.

Keywords

- ▶ homeopathy
- ▶ acute viral infections
- ▶ Bayes' theorem
- ▶ common symptoms
- ▶ repertory

Introduction

The recent COVID-19 pandemic opened an interesting window of opportunity for homeopathy.

Some of the relevant assets observed as a result of the epidemic are the following:

- Specific combinations of common symptoms may indicate a medicine and is only partly dependent on the cause of the disease.
- Multi-organ involvement is not a problem; rather, it is an opportunity for medicine selection.

- Homeopathy is available worldwide and is immediately available in most countries.
- Homeopathic medicines are cost-effective and easy to produce and disperse.
- Safety of homeopathy has been established due to low dosage and experience of over two centuries.

Acute viral epidemics are an interesting opportunity for homeopathy to show its potential applicability with reasonable certainty. An acute viral infection produces a limited set of typical symptoms, suggesting few eligible homeopathic medicines. However, the recent COVID-19 pandemic

appeared to have a more varied symptomatology than previous epidemics.¹ Still, this disease also produced mostly “common symptoms” that may have made remedy selection more complicated as peculiar, rare symptoms were often lacking. This resulted in a variety of prescribed homeopathic medicines.^{2–9} Handling of common symptoms is problematic in homeopathic practice because it is the unique or characteristic symptoms that usually confirm or contraindicate the curative remedy.

Beside this, there has been a basic limitation of the existing homeopathic repertories from the beginning, where medicine entries in the symptom rubrics are based on their absolute instead of relative occurrence (prevalence) in successful cases and provings.¹⁰ This has caused overrepresentation of frequently used medicines and incorrect or insufficient differentiation between medicines, especially with regard to common symptoms. Without proper epidemiological methods, it is not possible to know if the prevalence of a specific symptom in a population responding well to a specific medicine (medicine population) is, say, 30 or 50%. Such relatively small differences add up if several common symptoms are combined.

As an example, suppose we want to differentiate between medicine A and medicine B in a case with three common symptoms, say “headache,” “myalgia,” and “fatigue.” The prevalence of each of the three symptoms in the population responding well to medicine A is 50%; the prevalence of the same symptoms in the population responding well to medicine B is 30%. Now, suppose that the prevalence of all three symptoms in the remainder of the population is 40% in both cases. This results in a likelihood ratio (LR) of $50/40 = 1.25$ for medicine A and $LR = 30/40 = 0.75$ for medicine B (see ► **Box 1**). For a combination of symptoms, LRs should be multiplied. This results in a combined LR of 1.95 for medicine A and 0.42 for medicine B. If we estimated the success chance for both medicines to be 50% before knowing the three symptoms (prior chance), the posterior chance becomes 66% for medicine A and 30% for medicine B.

This example shows that a bayesian repertory can have considerable advantages over the existing repertories, especially in the cases that present mostly with common symptoms. The formula shows that we need to know the prevalence of a symptom in the whole population, as well as in respective medicine populations (patients responding well to a specific medicine). This requires unbiased collection of successful cases and subsequent unbiased analysis. Biased data could result in obscuring false information. Therefore, we should monitor and evaluate the data collection and the analysis of the data critically. In the “Materials and Methods” section, we show how this was done in an international data collection project of COVID-19 cases.

The COVID-19 data collection resulted in a bayesian repertory and a freely available web-based app for the necessary calculations (in English: <https://hpra.co.uk/> and Spanish: <https://hpra.co.uk/es>) for combinations of symptoms. It is freely accessible for all practitioners who used it for COVID-19 cases as well as influenzalike illness (ILI) and it is, after the pandemic subsided, increasingly being used for all

kinds of acute viral infections. This should be no surprise because the choice of a homeopathic medicine is not determined by the clinical diagnosis but by a combination of complaints represented by the common symptoms displayed by the patient. The 35 common symptoms comprising the mini-repertory and app cover a variety of acute viral infections. Some of the symptoms are keynote symptoms, but most are common symptoms, hitherto represented in large unreliable repertory-rubrics.

Modernizing the homeopathic repertory with practice-based data will require great efforts of many homeopathic practitioners. The COVID-19 pandemic offered unique opportunities to test a scientific approach in gathering and processing treatment data. The resulting instruments, mini-repertory and repertorization app, were appreciated by many practitioners because they improved handling of common symptoms. However, the COVID-19 period was too short to completely evaluate this fundamentally new repertory and further improvement with new data is also possible with this extended use. The extended use of this mini-repertory and app for different kinds of acute viral infections offers a great opportunity to further investigate the potential use and validity of a bayesian concept in repertory. This instrument has already been submitted to some testing in real-time practice, but this testing should be further expanded. In this article, we summarize the methods resulting in the mini-repertory and app and some ideas about further testing. Acute diseases are mostly characterized by a limited number of common symptoms that may be difficult to handle for inexperienced practitioners. A bayesian repertory containing a significant number of such symptoms enables extensive testing in acute diseases. Eventually, a randomized controlled trial would be the ultimate test. A first step is a better insight into the actual use of the mini-repertory and app. For this purpose, a button directing to a short questionnaire is added to the app. With this article, we aim to provide useful information about the scientific process leading to these instruments and to encourage practitioners to take part in further improvement of an instrument that is so important for our method.

Materials and Methods

In March 2020, a homeopathic case collection of COVID-19 cases treated with homeopathy was started by the American Institute of Homeopathy (AIH). The data were collected via an online questionnaire for anonymous case entries with checks for some common COVID-19 symptoms with the option to add other symptoms of the case as free text. Also recorded was the homeopathic medicine that appeared to be helpful. These data were supplemented by a data collection of the Directorate of AYUSH, Government of Delhi, India, using a customized Excel spreadsheet. These two data sets became the basis for a bayesian repertory, supplemented by data from other groups, such as European Committee for Homeopathy (ECH); Ärztesgesellschaft für Klassische Homöopathie (ÄKH); groups from Hong Kong, Italy, Turkey, and Barcelona; and individual homeopathic physicians.

The data collection was not fully prospective and adapted to new insights during the process. Some well-known COVID-19 symptoms were systematically checked from the start. Later, other frequently observed symptoms were added to the questionnaire for systematic checking. Ample opportunity to add more symptoms in free text fields remained possible.

Our main concern was the quality of the data.¹¹ Homeopathic doctors collecting the data generally have no scientific research training. The symptoms they observe are partly influenced by subjective observations and opinions—heuristic bias. This is mostly confirmation biased caused by preference for specific medicines suggested during the consultation. Observers should be aware of this subjectivity and try to handle it. We made great efforts to provide scientific training and feedback. The Indian doctors, in particular, organized consensus meetings to discover and prevent possible biases. All cases were checked for inconsistencies and doctors were contacted if necessary. Three weeks after starting the data collection, we performed the first statistical analysis, and the outcome was communicated to the participating doctors via newsletters dispersed by Liga Medicorum Homeopathica Internationalis (LMHI) and AIH. Over 40 newsletters were published, presenting the outcomes and opportunities for improvement.

Another quality aspect is assessing causality, the relationship between improvement, the prescribed medicine, and the observed symptoms. If more than one medicine is prescribed at the same time, it is not possible to assign the symptoms to one specific medicine. Spontaneous recovery could also confound the assessment of data. As most cases were mild and improved within 24 hours after the first administration of the medicine, this was considered the most objective criterion. Subjective assessment of causality is still inevitable, but observers should realize the consequence of this bias.

The quantitative analysis of the data consisted of calculation of the LR of symptoms: (prevalence of the symptom in the medicine population)/(prevalence in the remainder of the population) of symptoms (see ► **Box 1**).

The counting of prevalence of symptoms sometimes required semantic standardization. For instance, repertory-symptoms such as “weakness,” “weariness,” “lassitude,” and “prostration” were summarized as “fatigue,” which was the most used expression in the COVID-19 literature.¹² Homeopathic practitioners acknowledged that this expression represented what they observed. Homeopathic practitioners

Box 1 Bayes' theorem

Posterior odds = LR × prior odds
LR (likelihood ratio) = (prevalence in medicine population) / (prevalence in remainder of the population)
Odds = chance / (1 - chance); chance = odds / (1 + odds)
If LR > 1, the chance that the medicine will work increases. If LR < 1, it decreases

tend to choose repertory-symptoms that confirm their existing preference for a specific medicine—confirmation bias.

For the medicines with more than 20 cases, the LRs were calculated. An algorithm containing 11 medicines—*Ars, Bell, Bry, Camphora (Camph), Gels, Hep, Mercurius solubilis (Merc), Nux vomica (Nux-v), Phosphorus (Phos), Pulsatilla nigricans (Puls)*, and *Rhus toxicodendron (Rhus-t)*—was prepared using a separate spreadsheet. With this spreadsheet, the bayesian mini-repertory was retested with 358 Indian cases of the database.¹³

Results

After qualitative analysis, 1,424 cases out of over 3,000 cases were selected for quantitative analysis. In total, 76 different medicines were prescribed, but only 12 medicines were prescribed in more than 1% of the cases. The 10 most prescribed medicines represented 83.6% of all cases (see ► **Table 1**).

In total, 72 symptoms were recorded more than 10 times. The most recorded symptom was “cough” ($n = 842$; prevalence of 59.1%). This symptom was recorded for 61 medicines. ► **Table 2** shows the symptoms with prevalence greater than 10%.

For the medicines with more than 20 cases, the LRs were calculated, and a treatment algorithm was designed as described in the “Methods” section. Retesting the algorithm with existing cases revealed that the outcome of the algorithm strongly favored one medicine (*Merc*). Further analysis showed that the majority of *Merc* cases came from one doctor with a strong preference for this medicine after a publication suggesting *Merc* as a genus epidemicus.¹⁴ This resulted in lowering of cutoff values for the most common COVID-19

Table 1 Fourteen most prescribed homeopathic medicines during the COVID-19 pandemic, absolute numbers, percentage, and cumulative percentage

Medicine	N	Percentage	Cumulative percentage
Bry	408	28.7	28.7
Ars	228	16.0	44.7
Gels	140	9.8	54.5
Puls	104	7.3	61.8
Phos	80	5.6	67.4
Bell	63	4.4	71.8
Hep	55	3.9	75.7
Nux-v	48	3.4	79.1
Rhus-t	42	2.9	82.0
Camph	23	1.6	83.6
Merc	21	1.5	85.1
Sulph	18	1.3	86.4
Eup-per	13	0.9	87.3
Ant-t	12	0.8	88.1

Table 2 Symptoms with prevalence more than 10%

Symptoms	Prevalence (%)
Cough	59.1
Fever	50.6
Muscle/bone pain	47.5
Throat pain	43.0
Headache	42.1
Dry cough	40.4
Fatigue	39.7
Thirst	31.9
Chill	29.7
Dry mouth/throat	25.9
Slow onset	23.5
Loss of taste and/or smell	23.0
Anxiety/fear	21.3
Loss of appetite	20.9
Coryza	18.2
Productive cough	17.4
Thirst less	17.3
Dyspnoea	16.5
Chest discomfort	16.3
Perspiration	14.3
Diarrhea	13.3
Restless	12.7
Nose blocked	11.7

symptoms and subsequent exaggerated LRs in the majority of *Merc* cases. Therefore, *Merc* was removed from the mini-repertory and app.

The final version of the bayesian mini-repertory and app contained 35 symptoms covering 10 medicines: *Ars*, *Bell*, *Bry*, *Camph*, *Gels*, *Hep*, *Nux-v*, *Phos*, *Puls*, and *Rhus-t*. Some symptoms, such as “fever,” were left out because they did not differentiate between these 10 medicines. The LR values of the mini-repertory are shown in ► **Supplementary Table 1**, available in the online version.

Discussion

The COVID-19 pandemic offered the opportunity to adopt a “state-of-the-art” scientific approach to be better prepared for future viral infections, including the following:

- Worldwide online data collection.
- Detection of most useful homeopathic medicines.
- Prognostic factor research (PFR): what symptoms indicated which medicine?
- Assessment of causality relationship between improvement and prescribed medicine.

- Detection and management of possible bias.
- Repertorization applying Bayes’ theorem.

This “state-of-the-art” technology should not neglect what we already have achieved by practical experience and consensus. In the past two centuries, homeopathic practitioners developed instruments—materia medica and repertory—containing an incredible amount of information. Moreover, these instruments are used all over the world. The specification of homeopathic symptoms, especially vague symptoms, depends on many variables. Still, practitioners all over the world learned to use the same repertory and materia medica to differentiate between medicines. Scientists could object to the lack of specification, for instance, what is a “desire for sweets?” Such a desire depends on numerous variables such as age and profession, but also on culture. The average desire for sweets in, say, Kolkata is different from the same symptom in Delhi. Practitioners are able, from training and experience, to estimate the deviation from the average intuitively for individual patients, probably better than any algorithm.

This intuitive skill, however, has an important downside for PFR. Practitioners also use this skill for narrowing the number of preferred medicines during the consultation. Such preferences might result in confirmation bias. If the practitioner prefers a medicine that is characterized by, say, a desire for sweets, this is more readily perceived.

To establish a proper scientific identity for homeopathy, we must make choices.

Scientific priorities should be determined by improvement of the homeopathic method. In this process, three principal elements could be distinguished:

- Homeopathic instruments, especially the repertory, should be redesigned, but without losing existing assets.
- Scientists performing PFR in homeopathy should be aware of possible bias in clinical procedures. They must have homeopathic training as well as scientific training to recognize when such bias could occur.
- Clinical observations by homeopathic practitioners are the basis of successful prescriptions and data recording. We should use the knowledge and experience that enables intuitive estimates. However, observations for scientific use require additional training to handle heuristic bias.

All this indicates that the complexity of redesigning the homeopathic repertory should not be underestimated. Biased data and biased analysis of data will result in an ineffective new repertory. The recent COVID-19 data collection showed that some bias can be predicted, but much bias appeared unexpectedly after analyzing the database and communications with and between practitioners. This implies some trial-and-error elements in the development of homeopathy’s scientific identity. The bayesian mini-repertory and corresponding app for repertorization are meant to improve the applicability of common symptoms. We learned from informal communications with the users of the app that it seems to fulfil (part of) these expectations,

even after COVID-19 subsided. This offers a unique opportunity to extend the scientific assessment of the repertory.

Evaluation of the App

The homeopathic mini-repertory and app for acute viral infections are prototypes of an entirely new instrument, partly based on existing information. The app enables homeopathic practitioners to experience the applicability of a bayesian repertory in daily practice, as long as they are aware of its limitations.

First, it should be clear what the app is and what it is not. The app is an instrument based on an assessment of 35 homeopathic symptoms and 10 medicines, and its functionality is restricted to those symptoms and medicines only. It is based on calculating “condition-confined LR” of the symptoms valid for COVID-19-like disease/ILI, which culminates into combined LR when more symptoms are added. For these symptoms and medicines, the app offers an unprecedented opportunity: accurate interpretation of common symptoms of a disease/infection with a far more precise differentiation between the 10 most used remedies.

The app cannot advise about other medicines and symptoms and its use is therefore limited to diseases in which these medicines and symptoms are predominant such as

acute viral diseases. Moreover, if the patient has symptoms that clearly indicate other medicines than the 10 represented in the app, such medicines should be prescribed.

An early version of the app based on 161 cases and comprising 20 symptoms and three medicines has been tested with published COVID-19 cases.¹² The app recommended the same medicines as prescribed in 16 of 17 cases. The app recommendations were based on three to eight mostly common symptoms, while the original classical repertorizations counted nine to 26 symptoms.

The present version of the mini-repertory and app is based on 1,424 cases and comprises 35 symptoms referring to 10 medicines. A variety of acute viral diseases produces cases with only common symptoms, and many of those symptoms are present in the app. The existing repertory is useless in such cases, while the bayesian approach is much more precise in this respect. The number of medicines is limited, but these medicines are the most prescribed in acute viral infections: *Ars*, *Bell*, *Bry*, *Camph*, *Gels*, *Hep*, *Nux-v*, *Phos*, *Puls*, and *Rhus-t*.

The app seems to be helpful for a variety of acute cases, but yet we have insufficient information about the usefulness of the app. To evaluate the use of the app, a questionnaire was developed that can be accessed via a button at the end of the app (“More Information and Feedback”; see ►Fig. 1). We

What are the symptoms?

<input type="checkbox"/> Muscle or bone pain	?
<input type="checkbox"/> Dry cough	?
<input type="checkbox"/> Productive cough	?
<input type="checkbox"/> Fatigue	?
<input type="checkbox"/> Headache	?
<input type="checkbox"/> Sore throat	?
<input type="checkbox"/> Thirsty	?
<input type="checkbox"/> Thirst less	?
<input type="checkbox"/> Loss of taste and/or smell	?

Tick the symptoms. If a medicine is indicated by the selected symptoms, it will show here.

[Reset Symptoms](#) [More Information and Feedback](#)

Fig. 1 Print screen of the hpra app with a button (encircled) to access additional information and a questionnaire for evaluation of the app.

invite homeopathic practitioners to apply the app (English: <https://hpra.co.uk/> and Spanish: <https://hpra.co.uk/es>) in acute viral cases when there are no clear indications for a specific homeopathic medicine.

This short questionnaire to evaluate this new instrument for homeopathy is just a first step to identify the users of the app and to improve it in the future. Many other validation methods are conceivable. The ultimate testcase for this new bayesian repertory would be randomized controlled trials, comparing treatment outcome using the bayesian repertory with the standard methods.

The development of a complete bayesian repertory seems an immense task that requires multiple steps. A large part of the original repertory is less problematic, especially the numerous smaller symptom-rubrics referring to peculiar symptoms, because the bias caused by absolute occurrence is less. The largest rubrics, representing common symptoms, should have priority and can be integrated in the existing repertory step by step.

The applicability of this bayesian mini-repertory might seem low compared to the vast number of possible indications for homeopathy, but acute viral infections represent the most frequently occurring conditions in daily practice. There will be many cases without clear indications for specific homeopathic medicines because of the lack of specific and/or peculiar symptoms. For such cases, the app could be a valuable addition to the existing homeopathic instruments. It will also help young practitioners who are not very confident in medicine selection.

Another aspect of this instrument that is based on systematic data collection is the potential showcase of the (scientific) potential of homeopathy. This condition-confined instrument has the following assets¹⁵:

- Scientific quality.
- Algorithmic approach.
- Reproducibility.

This showcase could draw the attention of doctors toward homeopathy when they search for a solution in therapy-resistant diseases. For homeopathic practitioners interested in research, it offers the opportunity to participate in the improvement of their method. It will also give a platform for meaningful exchange of experiences and drawing consensus for the greater good of homeopathy.

For homeopathic practitioners, it should be clear that this bayesian repertory is just the start of the development of a complete bayesian repertory with many more symptoms and medicines. This work will require the effort of many practitioners. Practitioners can indicate their interest to participate in this project via the questionnaire that is linked to the button at the end of the app (see ► **Fig. 1**).

Funding

None.

Conflict of Interest

None declared.

Acknowledgments

We thank all the colleagues who contributed to the data collection. We also thank all the organizations that supported this data collection: American Institute of Homeopathy (AIH), Directorate of Ayush, Government of Delhi, India, Liga Medicorum Homeopathica Internationalis (LMHI), European Committee for Homeopathy (ECH), and Ärztesellschaft für Klassische Homöopathie (ÄKH). Theodore Lilas assisted with structuring of our spreadsheet. Special thanks to Tom Smedley for his voluntary contribution in programming the app. He translated the way homeopathic practitioners think into a wonderful algorithm.

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