Collecting clinical experience of homeopathic support in COVID-19, newsletter 17

Bayesian analysis of symptoms, 16th issue

LMHI newsletter November 2020

This newsletter celebrates the publication of the third version of the app and the corresponding new COVID-19 mini-repertory. The latest version of the app is based on 522 cases from 14 countries and over 100 doctors. The cases were selected out of more than a thousand, the selection being made to optimise the mini-repertory. The new app is in English (https://hpra.co.uk/) and in Spanish (https://hpra.co.uk/es).

Making a new repertory for a new disease with new methods is a learning process, both for the doctors who send in their cases and for those who evaluate the data. In this newsletter we hope to inform you about this process so that we can continue to learn from each other.

Selection of cases to optimise the repertory

Selecting cases for a Bayesian repertory has nothing to do with the qualifications of the doctors who send in the cases. We are most grateful to each of them and we want to reward their efforts with a repertory that produces the best results in clinical practice.

If a patient responds very well to two homeopathic medicines, we cannot tell what symptoms we should link to which medicine. The aim is be able to know the prevalence of each symptom in each medicine population; if this prevalence is above average, the indication for the medicine is above average, whilst if the prevalence is below average, then similarly the indication for the medicine by that symptom is less than average.

We also want to have some indication that the cure is caused by the medicine, bearing in mind that 80% of the "cures" of COVID-19 disease are due simply to spontaneous recovery. Homeopathic cures have some interesting features, such as a rapid improvement in wellbeing, and the description of the healing process often gives an indication that the medicine caused the cure.

We devote a lot of time to checking every single case for indications that the medicine is related to the cure. Where this appears to be so, these cases can be used for counting the prevalence of symptoms related to specific medicines. Other cases – such as those responding to more than one medicine – cannot be used for this purpose, but are still useful for qualitative analyses.

Qualitative analysis of cases could lead us to find interesting symptom patterns indicating specific medicines, to more medicines that could be useful for COVID-19, et cetera.

A learning process

This newsletter is not just to advise you how to treat COVID-19, but more to help you help us in optimising such treatment. Recording cases to inform research is a new skill, and one which is not yet part of most homeopathic training.

The most important pitfall in case collection is confirmation bias, i.e. the confirmation of pre-existing ideas. This bias could derive from a patient who thinks that the doctor wants to hear confirmation of all expected symptoms. Confirmation bias could also influence the doctor, who may try to elicit all possible symptoms that indicate the preferred medicine and neglect those symptoms that do not confirm that medicine.

We, as analysts of the data, are happy to acknowledge that we have had to learn too. We struggled with how to handle missing data. Some symptoms were not present in certain medicine populations; such symptoms will then give a LR of zero, and thus – according to Bayes' formula - the chance that the corresponding medicine will work also becomes zero. Intuitively, we know that this is not correct. Further, when we combine symptom LRs by multiplication, the combined LR also becomes zero if one of the symptoms has LR=0. To resolve this problem, where the specific medicine population had no data, we assumed that the symptom has the mean prevalence as in the whole population, resulting in LR=1.

This now appears to be a mistake! Suppose the symptom 'Thirst' was not present in 25 patients who responded well to *Pulsatilla (Puls)*. (There could be confirmation bias: 'Thirst' is not expected in *Puls* patients and is therefore less likely to be inquired about.) In this case, we would take the average prevalence of thirst in the overall sample, which was 22.8%, and assume an LR=1. Now suppose that the 26th patient appears to have thirst. The measured prevalence of 'Thirst' in the *Puls* population now becomes 1/26 (3.8%). This results in LR=0.16 for this symptom in relation to *Puls* and our assumption of LR=1 can now be seen to have been a considerable over-estimate.

We neglected the fact that Bayesian statistics has an intuitively good solution for this: the truth is assumed to lie midway between our prior belief (the population average) and the measured value of zero in 25 cases. This would result in an assumed prevalence of 11.4% for 'Thirst' if there were no records in this population.

We corrected this mistake in the third version of the app and the corresponding mini-repertory; that this was the right thing to do was confirmed because we obtained better outcomes when testing the app with existing cases.[1]

The new mini-repertory and app

We now have included 93 *Arsenicum album (Ars)* cases, 177 *Bryonia (Bry)*, 52 *Gelsemium (Gels)*, 22 *Phosphorus (Phos)* and 26 *Pulsatilla (Puls)*. The number of symptoms has been expanded to 25. The mini-repertory is shown in Table 1 on the next page.

The app for making the necessary calculations can be found at:

https://hpra.co.uk/

The Spanish version of the app can be found at https://hpra.co.uk/es

[1] To, Ka Lun Aaron; Fok YYY. Homeopathic Clinical Features of 18 Patients in COVID-19 Outbreaks in Hong Kong. *Homeopathy*. 2020;109:146-162. doi:10.1055/s-0040-1710545.

Confirmatory symptoms

The database also offers information about symptoms for confirmation, such as:

- *Arsenicum*: anxiety, sleeplessness; desire for warm drinks; fear of death
- *Bryonia:* thirst for large quantities; cough < talking; cough < deep inspiration; desire for rest; motion aggravates
- *Gelsemium*: involuntary urination from cough; heavy eyelids – cannot keep eyes open; chilly back; headache > profuse urination
- *Phosphorus*: gasping for air; fear of being alone; desire for cold drinks; blocked nose
- *Pulsatilla*: loss of appetite; wants to be held; bitter taste, weeping; blocked nose

Table 1: Update of the COVID-19 mini-repertory with LR values, based on 522 cases; 93 Arsenicum (LRars), 177 Bryonia (LRbry), 52 Gelsemium (LRgels), 22 Phosphorus (LRphos) and 26 Pulsatilla (LRpuls)
LR = likelihood ratio = (prevalence in medicine population)/(prevalence in remainder of the population).
LR>1 means that the indication for the medicine is above average
LR<1 means that the indication for the medicine is below average

Symptoms	LRars	LRbry	LRgels	LRphos	LRpuls
fatigue	1.40	0.68	2.02	1.19	0.32
dry cough	0.74	1.53	0.87	1.10	0.45
productive cough	1.20	0.46	0.67	2.14	3.05
dyspnoea	0.53	0.94	0.86	2.17	0.47
headache	0.58	1.45	1.37	0.84	0.81
fever	0.88	1.02	1.22	1.44	1.21
chill	0.61	0.84	3.23	0.92	1.09
perspiration	0.58	0.56	1.81	2.84	3.82
diarrhoea	1.51	0.68	1.07	2.04	1.19
sore throat	1.04	1.39	0.74	0.25	0.98
muscle/bone pain	0.88	1.52	0.94	0.78	0.46
loss of taste and/or smell	0.57	0.96	0.24	1.65	2.57
thirst	1.85	1.85	0.23	1.21	0.16
thirstless	0.28	0.40	3.57	1.36	3.90
chest discomfort	0.71	1.00	0.89	2.98	0.89
taste bitter	1.09	1.20	0.45	0.49	2.58
nausea	2.01	0.62	1.25	0.71	1.23
back pain	0.20	2.73	0.39	0.99	0.49
abdominal pain	0.99	1.06	0.56	1.42	2.54
chest pain < cough	0.23	2.14	0.45	2.39	0.49
vomiting	1.73	0.19	0.90	5.05	4.24
constipation	0.42	5.85	0.47	0.49	0.83
> open air	0.31	0.89	0.60	0.49	2.73
restless	5.38	0.58	0.47	1.89	1.59
> lying	0.92	2.73	0.82	0.49	0.49

The LMHI COVID-19 case collection team

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