Likelihood Ratio And Repertory: A Useful Tool To Update Our Repertories

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Abstract: Background: Homoeopathic Science is focusing on the scientific explanation regarding its medicinal action and prescriptions in language of Research and Methodology. Whenever the word Research is there in any area, statistics comes automatically for presentation of the research findings. Homoeopathy accepts various Statistical Methods in its research studies to show their efficacy in Medical Science. Likelihood ratio is one of the statistical tools that help Physicians to develop skill in diagnosis of the various disease conditions. In Homoeopathic Science, this tool is not only helpful in case management but also help us to update our Repertories with its scientific data obtained by various case studies. So, let's explore this tool named Likelihood ratio and its utility in Homoeopathic Tool named Repertory. Material And Methods: It is a type of analytical study with following inclusion and exclusion criteria. Inclusion criteria: Most frequently cited articles of likelihood ratio were included. Exclusion criteria: publications of article based on likelihood ratio before year 2000 AD were excluded from study. Result: Less than 9 articles with most frequent citation were eligible for study. There was scarcity of data regarding likelihood ratio in Homoeopathic Science. Conclusion: Many research papers regarding utility of likelihood ratio and repertories are present in Homoeopathic world but still the concept is not able to put a great impact on Homoeopath's mind. Acceptance of this tool may help us to improve our Homoeopathic practice as well as standards of our Homoeopathy in Medical Science. [Chotaliya J Natl J Integr Res Med, 2022; 13(3): 28-31, Published on Dated: 10/05/2022]

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Introduction: Likelihood Ratio In Medical Science: Medical Science believes in Continuous efforts to improve its methods in terms of quality care. It accepts all the new tools or discoveries that help them to achieve their goal of highest efficiency.

Likelihood ratio is statistical tool based on probability that will help us to improve our Skills at diagnostic and prognostic levels. Likelihood ratio is considered as a strange concept that is not probability but proportional to Probability[1].It is best tool which could be use for diagnostic accuracy but its unpopularity lies in its methods of interpretation. Interpretation requires calculator to convert back and forth between "Probability and odds"[5]. There are now many formulas and methods available that help us to replace calculator and nomograms for its calculation. It deals with signs and symptoms.

Likelihood ratio is widely applicable in medical science due to its utility in various different settings. Apart from its utility in positive and negative probability, it can be used to compare the accuracy of same test for different definitions of diseases, which guide us to judge the value and limitation of test.

Likelihood Ratio In Homoeopathy: Likelihood ratio in Homoeopathy is useful tool as Homoeopathy considers research as an essential tool for its survival in medical science. Likelihood ratio helps homoeopath in case management.

Material & Methods: It is a type of analytical study with following inclusion and exclusion criteria.

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Results: A likelihood ratio is the percentage of ill people with a given test result divided by the percentage of well individuals with the same result.

Abnormal test results should be much more typical in ill individuals than in those who are well (high likelihood ratio) and normal test results should be most frequent in well people than in sick people (low likelihood ratio). When combined with an accurate clinical diagnosis, likelihood ratio from ancillary tests improves

diagnostic accuracy in a synergistic manner[3]. Likelihood ratio is a type of tool that summarizes the evidence and having characteristic of easy adaptability to various purposes[2]. Steven in his article about likelihood mentioned about it in very lucid way as follows,

$$LR = \frac{\text{Probability of Finding in Patients with Disease}}{\text{Probability of Same Finding in Patients without Disease}}$$

For example, among patients with abdominal distension who undergo ultrasonography, the Physical sign "*Bulging flanks*" is present in 80% of patients with confirmed ascites and in 40% without ascites. The LR of "Bugling flanks" in detecting ascites, therefore, is 2.0 (i. e. 80% divided by 40%). LRs may range from 0 to infinity.

Findings with LRs greater than 1 argue for the diagnosis of interest; the bigger the number, the more convincingly the finding suggests that disease. Findings whose LRs lie between 0 and 1 argue against the diagnosis of interest; the closer the LR is to 0, the less likely the disease. Findings whose LRs equal to 1 lack diagnostic value[5].

Understanding of likelihood ratio in context of conditional probability is worthy of consideration.

In conditional probability, hypothesis is fixed and data may vary. In likelihood ratio, it is opposite, i.e. hypothesis depends upon data as if they are fixed and hypothesis may vary. In 1912, article named likelihood, Edward described about this as following, "The likelihood axiom as a natural combination of the law of likelihood and the likelihood principle.

The likelihood axiom takes the implications of the law of likelihood together with the likelihood principle and states that the likelihood ratio comparing two statistical hypotheses contains all the information which the data provide concerning the relative merits of that hypotheses.[1]"

Compare different level of findings for same disease i.e. some questionnaire has different level to measure the extent of effects caused by disease from 0 to 6. So, in that 0 indicates decrease the probability while 5 or 6 indicate the highest possibility. Other levels like 1, 2, 3 and 4 have their own extent to manifest the possibility. Useful for obtaining diagnostic accuracy of same test for same disease in different settings. I. e. extent of breathing difficulty in diagnosis of pneumonia is different for different age group. i. e. 60 breaths per minute or more respiratory rate is considering as fast breathing in pneumonia while more than 50 and 40 breaths per minute is consider as a fast breathing for child aged 2 months to 12 months and 12 months to 5 years respectively.

Discussion: Prescription is the most important part of Case management. For accurate prescribing, one must well converse with accurate diagnosis as well as individual characteristics of case. Detail study of diagnostic criteria along with utility of likelihood ratio will help homoeopathic physician to diagnose the condition accurately as well as he/ she is able to understand the individualistic symptoms in more precise way.

In order to understand the likelihood ratio and its utility in day-to-day practice, one of the indirect advantages for physician is to become the keen observer. He / she will be more active and focused in case perception to get every minute detail that will help them for case management.

Likelihood Ratio In Repertory: Repertory is a type of reference tool in Homoeopathic Science. It contains remedies in different gradations opposite each rubric. Gradation in Homoeopathy is nothing but a type of mark that signifies the characteristics and its intensity carried by that particular medicine.

Gradation for particular medicine was derived by 2 ways, i.e. during drug proving of that particular medicine and from past clinical experiences by Homoeopaths in their clinical Practice. As the time changes so as the environment and our lifestyle, there may be chances that the gradation that was seen during that time may be no longer suitable for present era.

Homoeopathic drug proving is not a new venture of present time but an old scientific technique of Homoeopathic Science since its inception. There are possibilities that some medicine was not fully explored in terms of their action during that time and gradation for that particular medicine may be underrated or there may be frequent use of some medicines were overrated in terms of gradations.

If we study the relationship between the likelihood ratio and gradations of the remedies in repertories then it is simple that higher the likelihood ratio, higher will be the gradation of that medicine for particular rubric and vice versa.

For example, Rubric "Bad news, ailments from" of Mind section of Repertory of Homoeopathic Materia medica by J. T. Kent contains Calcarea and Gelsemium in 3 marks, Apis, Ignatia, Medorrhinum, Nat-mur, Palladium and Sulphur in 2 marks, while other 11 are having 1 mark[4].

If we study this presence of this rubric in current clinical trials and various case record data of Homoeopathic physicians, along with above mentioned gradation as pre–test probability then there will be possibility to find some more information regarding the action of these medicines in context of this rubric.

Let's assume, if we study Apis Mellifica from that case records, there may be possibility to find Apis Mellifica will work more effectively when this rubric is present in case and upgrade its marking from 2 to 3 marks. This will not only update our repertories in terms of gradation but will also help us to explore more about the extent of action of Apis Mellifica.

There are many remedies in our repertories that are lesser known and less used in clinical practice. Likelihood ratio will help us to find out the utility of particular medicine with that rubric and also help us to improve our utility of lesser-known medicines.

Cautions Regarding The Utility Of Likelihood Ratio: Selection of rubrics for particular case according to symptoms of patient may vary from homoeopath to homoeopath and that may be subjected to overuse or ignorance.

Case Results i.e. Improvement criteria of cases depends upon various factors like, patient's subjective feeling, physician's interpretation, disease condition, its prognosis and that might prove hurdles for correct interpretation in terms of improvement.

Prescription method varies from homoeopaths to homoeopaths around world might be point of discussion.

Lack of Utility of Likelihood ratio and Statistical application by Homoeopaths.

Selection criteria for standard of pre test probability may be difficult due to presence of many repertories with different presentations and gradations for same rubrics.

Application of likelihood ratio in accurate way needs unbiased case prescriptions, fixed standards to measure the improvement levels.

So, Application of Likelihood ratio in Present time in our Clinical trials as well as clinical Practice will help us to update our repertories with its full utility.

Conclusion: Many research papers [6,7,8,9] regarding utility of likelihood ratio and repertories are present in Homoeopathic world but still the concept is not able to put a great impact on Homoeopath's mind. There are many reasons behind it and one of the most important one is failed to understand and application of statistics in educational and clinical level. Acceptance of this tool may help us to improve our Homoeopathic practice as well as standards of our Homoeopathy in Medical Science.

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