

Publication Voting Power (PVP): method of finding Evidence-Support

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Abstract

Background: Extracting the best evidence that support a procedure is a difficult, time consuming task that needs expert statistical knowledge. A way to make weighting evidence more simple and straight for busy clinicians is needed.

Methods: The publications about the procedure under question are lined in an ascending order of strength of their evidence according to the research type. Each publication type is assigned a voting power that reflects its level of evidence. An arbitrary start of the voting power is put at 0.5 an increased by 0.5 successively. For each procedure the powers of the publications that support it are added together to make its final voting power.

Results: The procedure with the highest voting power will be the one supported with more evidence. In the example given, the procedure with the highest vote for portal hypertension is distal splenorenal shunt and for peptic ulcer disease is partial gastrectomy.

Conclusions: A simple method to get an evidence-based support to a procedure is described. It depends on putting the publications in a hierarchal order and assigning a power (Publication Voting Power) to each. As much publications as possible should be sought to make the choice more truthful.

Key words: Evidence based medicine, surgical procedures



Introduction

The Sudan Society of Gastrointestinal and Liver diseases asked me to give an evidence-based talk about surgical treatment of upper gastrointestinal haemorrhage. I entered the Internet thinking that I will find, easily, the evidence that leads me to the best surgical way of dealing with such a wide and difficult topic. I actually entered into the dilemma of evidence-based medicine! Apart from the technical difficulties that make finding evidence from the net a hard, time consuming task, it is even harder to compare, evaluate and draw a conclusion from the numerous, diverse publications. I started to read about evaluating the evidence trying to avoid the complicated statistical procedures. The task is almost impossible to be done in the short time (a week) given to me. What about a surgeon who needs a quick answer (hours) for a bleeding patient! What adds to the confusion is the difference between the publications that are put under the same research type. Randomized controlled trials, that are considered the cream of research, are subdivided into good, bad and in-between. Good randomization but no blinding. Good selection of cases, bad randomization. Good everything, bad statistical analysis. Endless variables that can make the study good or bad^{1,2}. Even the values of these variables are not agreed upon. What I want to do in this article is to describe a way by which finding evidence becomes a simpler task. Hopefully this method will be reliable enough to be safe and useful.

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Literature Review:

There is great difference in the grades of recommendation suggested by different authors. Palmer in the Guidelines³ of upper GIT haemorrhage suggested a grading system that deals directly with the research type. Wright and associates gave a complicated grading⁴ system that depends on another grading system that deals with the level of evidence. To determine the level of evidence one has to analyze in depth each publication⁵. Even after this elaborate study, some have their reservations⁶. The grading systems are revised and made more detailed and, necessarily, more complicated. An example is that which was developed by the Scottish Intercollegiate Guidelines Network Grading Review Group¹. This detailed grading is good for guidelines developers as they have time and money, but a busy clinician is urgently pressed to find an evidence-based solution to an acute problem.

As Hans wrote⁷: (Many areas of uncertainty exist in surgical practice ranging from the indications for surgery to the preferred surgical management and the perceived outcomes following treatment). This triad is all present in the question I am trying to solve now; what is the preferred surgical management for acute upper GIT bleeding? Instead of suggesting a quick, simple way of getting and weighting the evidence, Hans put a pre-requisite for this: (evidence-based practice involves the application of tools to facilitate the acquisition and integration of information from these sources in the clinical setting). Tools mean complicated statistical analysis that a busy clinician may have neither

time nor expertise to do when an urgent clinical setting presses upon him!

Although in my present situation I am not really pressed by an acutely bleeding patient, I imagine myself dealing with such a condition. I want something simple, quick and useful. Something that gives weight to the publication without struggling with complicated statistics.

Materials and Methods

I started with the publication type that was written at the end of each abstract or full text. If no publication type was written, then I read the (patients and methods) section to know the type of publication. Helped by articles that were written to evaluate types of research, I arranged the publication types in their order of importance, almost following the hierarchy of the Scottish Group¹. A good way to test the validity of the publication is to calculate the Absolute Risk Reduction. This can be explained by the following example:

If we treat 48 patient with a particular procedure (A) and 6 out of them died compared to 77 patients treated with another procedure (B) but 7 patient died

$$ARR = \frac{6}{48} = 0.125\% \quad \frac{7}{77} = 0.09\%$$

ARR = 0.125 - 0.09 = 0.035 i.e. 35 patients in every 1000 cases will be saved from the bad effects of procedure A whatever the P value is.

They came in the order shown in table (1).

Table (1) Publication Types with their Voting Powers

Type of the study	Vote
Case Study	0.5
Comparative	1
Case Control	1.5
Cohort	2
Randomized controlled trial	2.5
Meta Analysis	3

The next step was to create a way by which each publication was measured according to its rank of importance that reflected the relative power of its evidence. I invented what I call Publication Voting Power (PVP). It is a simple numerical value given to each publication type. I started this power by the arbitrary number 0.5 which I gave to the case study and increased it by 0.5 as I went up the ranks of the publication that was decided previously. Now each publication was given a PVP as shown in table (1). In the comparative studies one or more surgeons are

doing more than one type of operation to the same problem without selection, randomization or control. After sometime these different procedures are compared and the one giving the best result is announced. I went back to my search question: What is the current surgical treatment of upper GIT bleeding that is evidence-based?

To make my search simple, I divided the causes of upper GIT bleeding into two main problems; portal hypertension and peptic ulcer disease, excluding other ones. I looked into the method section of the publications to know the operations that were being done for these two main causes. These were written in the order that I found them in the search as shown in table (2) for portal hypertension and table (3) for peptic ulcer disease.

Table (2) Final Vote for portal hypertension operations

Operation	Vote	Sum of the votes
Transmural ligation + fundoplication	0.5	0.5
Oesophageal transaction	1 + 0.5	1.5
Portocaval Shunt	3+1	4.0
Distal Spleno-renal Shunt **	1+1+ 0.5 + 0.5+1+ 1+2 +1+0.5	8.0
H- Graft (meso and portocaval).	1.5	1.5
pericardial devascularization + proximal splenorenal shunt	2.5	2.5
Transmural Variceal ligation and fundoplication.	0.5	0.5

** This is the winner.

Table (3) Final Vote for operations for peptic ulcer disease.

Operation	Vote	Sum of the votes
Partial Gastrectomy *	2.5+0.5+0.5+ 0.5	4.0
Undersewing + vagotomy + Drain	0.5+ 0.5+ 2.5	3.5
Undersewing Alone	0.5	0.5
Vagotomy + Antrectomy **	0	0.0

* This is the winner. ** Mentioned but no one preferred it.

To know the preferred operation for each publication, I read the conclusion. For each publication type I gave it's voting power to it's preferred operation.

Results

When all the publication voting powers were included, the votes were counted and a sum was written opposite each operation. This was done for both portal hypertension and peptic ulcer disease. The operation with the highest vote meant that the best evidence supported it. The results are shown in tables (2) and (3) respectively

Discussion

Randomized controlled, double blind trials in surgery are neither feasible nor ethical in most of the conditions. Most of the evidence is found in case series or sought through direct consultation of an experienced surgeon. Systematic review, like meta-analysis, is the best way to obtain accurately weighted evidence. Narrative reviews are also good as an alternative. But these have to be ready for a busy clinician to pick up, and for most surgical conditions they are not available. Other research types should not be discarded, as valuable evidence is sometimes found in less valued research and in many instances it is the only source of evidence available.

The way to find the relevant publications in the vast ocean of data should be made simpler and straightforward. The Internet search engines are becoming more and more accurate and quick, but still a lot of irrelevant information is caught by whatever method one uses, which makes sorting out the data more time-consuming. Also a lot of relevant publications may not be caught in spite of using the Mesh terms. To get the best of publications, one should search the following areas systematically: Pubmed, Cochrane, HINARE, and Free medical journals.

For a busy clinician, an alternative way to weigh the evidence should be accepted even in the face of a less accurate method. This, surely, is better than having nothing when there is no time for taking the long hard way. The main problem is to determine the value of published research. Not all the criteria that define a good research are obtainable globally. In developing countries optimal conditions to do a research are difficult to get and research is done in less than that. Even in developed countries researches vary in their methods and the value of some are questioned. The methods of measuring the strength of evidence should be made clear and simple for use. If the publishers decide the level of evidence for every publication and include it at the end of the

article, as is done by the Journal of Bone and Joint Surgery², then putting the evidence in it's accurate hierarchal position in the method described here will be easier and more reliable. If the level of evidence is not given, then a simple way to determine it's level is as follows:

The research types given in this article are meant to be examples to explain the method and may not be comprehensive. If one finds more types of publications, or detailed subdivision to the publications^{1,2}, then one should arrange them in an ascending order of importance and start by the power 0.5 and adds 0.5 to each following level. The more publications one find, the more will be the accuracy of the method.

This method can be used in fields other than surgery. In finding evidence supporting a drug, a diagnostic test or an investigation one can use the voting power in the same way.

Testing this Method:

The accuracy and reliability of this method can be tested by comparing it to the end result of a published meta-analysis. The component publications of a meta-analysis could be assigned voting powers and the best procedure is determined by calculating the final vote. The result is then compared to the result reached by the meta-analysis.

A published meta-analysis⁸ is chosen to make the above test. It has the following objective: (To review randomised controlled trials of treatment with a proton pump inhibitor in patients with bleeding ulcer and determine the impact on mortality, rebleeding, and surgical intervention). It analysis 21 published randomized controlled trials. Seventeen of these were retrieved, but the other four could not be retrieved using different search strategies. The ones which were not found were the references numbers 16, 31, 32 and 33 in the original article in reference 8. As all the publications were randomized controlled trials, each one was assigned 0.5. The impact on outcome is; decreased mortality, decreased or no rebleeding and decreased or no surgical intervention. 0.5 was given to each outcome when improvement was found by the study. If there were improvements in more than one outcome, each would be given 0.5. The publications in which no improvement was found in any outcome meant that their voting power is zero for all. These are the references number 13, 14, 15, 17, 18, 22 and 23 in the original article in reference 8 . The final vote is shone in table (4). The comment from this final vote is that; proton pump inhibitor did not have an effect on mortality

but it had decreased the rebleeding and to a lesser extent decreases surgical intervention. The comment in the original meta-analysis was (In summary, proton pump inhibitor treatment does not reduce mortality after ulcer bleeding, though it does reduce rates of rebleeding and, in general, the need for surgical intervention)⁸. The comments are identical.

Table (4) Final Vote for the impact of use of proton pump inhibitor on outcome in bleeding peptic ulcer.

Outcome	PVP	Sum
Mortality	None	0.0
Rebleeding	9 × 0.5	4.5
Surgical intervention	4 × 0.5	2.0

To summarize the steps;

- 1- Know how to search the net and do it.
- 2- Write down the publication types that you find.
- 3- Give each publication a voting power. Use mine.
- 4- Find all the procedures that are done to solve the problem.
- 5- Give the voting power of each publication to it's preferred procedure.
- 6- Sum up the votes and announce the winner

Conclusion:

This method is not a replacement to systematic reviews that use statistical analysis, like meta-analysis, as the latter is included in the former. It is a simple method to get an evidence-based support to a procedure using a short way. It depends on putting the publications in a hierarchal order and assigning a power (called here Publication Voting Power) to each decreases surgical intervention. The comment in the original

meta-analysis was (In summary, proton pump inhibitor treatment does not reduce mortality after ulcer bleeding, though it does reduce rates of rebleeding and, in general, the need for surgical intervention)⁸. The comments are identical.

The best procedure is then decided by simply adding the powers of the publications in which the procedure is preferred

Recommendations

- It is recommended that publishers determine the level of evidence for each publication and write it at the end of the full publication and abstract.
- Researchers are invited to test this method and compare it to standard methods taking into account the benefits of its simplicity

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