EVIDENCE BASED MEDICINE IN PEDIATRIC PRACTICE: BRIEF REVIEW

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Abstract:
It is comprised of a standard and systematic literature finding among all the available research documentations, and then appraisal of that searched document and introduction of results and final evaluation of the medical practice.

Due to the availability of large amounts of data in this field, the searching for best evidence is a difficult task. The lengthy procedure makes it ineffective at sometimes, which are the main hindrance.

The “evidence-based study” is the standard procedure and reduces a lot of time in searching procedure routinely.

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INTRODUCTION:
The “evidence-based medicine” is the vital attestation in the literature during routine practices. [1,2] The word “evidence-based study” was instituted by Guyatt in the year 1991. It is comprised of a standard and systematic literature finding among all the available research documentations, and then appraisal of that searched document and introduction of results and final evaluation of the medical practice. [3]

Due to the availability of large amounts of data in this field, the searching for best evidence is a difficult task. The lengthy procedure makes it ineffective at some times, which are the main hindrance. [4,5]

The “evidence-based study” is the standard procedure and reduces a lot of time in searching procedure routinely. There are four steps. This evidence-based study is different from the old traditional studies and is definitely effective.

Steps
• Step 1: To ask an answerable question
• Step 2: To find out the best evidence
• Step 3: To critically appraise the found-out literature

The use of “evidence-based medicine” is getting focus in the field of pediatrics. [6,7] The main point to focus of this review is a clinical trial.

To Ask an Accounting Question (PICO approach):
The keystone of EBM is to find out the answerable questions. This is the vital part because all the next working is based on this one. [8,9]

Mostly, the clinical questionnaire consists of four parts.
1. Specific Patient or population
2. The intervention IN the effective study, which includes the type of treatment
3. The comparison with the standards to find out the effect of mediation
4. Outcome of the overall study

For Example
Suppose that a 2.5-year-old boy is having diarrhea. To find out that the effectiveness of Probiotics such as Lactobacillus species in reducing the diarrheal duration in comparison to the “Oral Rehydrating Treatments”, we will do this trial.

The questionnaire for this procedure is as under:

| “Patient/ population”       | Diarrheal episodes to a 2.5 year old boy |
| “Intervention”              | Probiotic therapy with Lactobacillus sp. |
| “Comparison”                | Oral rehydrating treatment               |
| “Outcome”                   | Reduced episodes and frequency of diarrhea |
| “Question”                  | A Comparison of both therapies to find out which one is effective |

To Search the Vital Evidence:
Numerous resources are present to find out the best evidence. An effective strategy is essential for saving energy, resources and time. Haynes suggests to use the medical resources in accordance to the “hierarchy.” [10,11] The hierarchy consists of “Studies”, “Syntheses”, “Synopses”, “Summaries”, and “Systems.” This is known as 5S hierarchy. This approach reduces the quantity and increases the quality.
• **Studies** come at the bottom of the “hierarchy.” It is very time consuming and requires a lot of effort.

There are numerous databases which are effective for this. Some of them are Medline's PubMed, SCOPUS, and an ISI web of knowledge. The first one is available online while the next two can be approached via Athens System.

The questionnaire should be attached with “Boolean Operators.” For example, for the above-mentioned example the PICO study will be as under: “(Child OR, Toddler OR, Pediatric) AND (Diarrhea) AND (Probiotic OR Lactobacillus) AND (Duration OR frequency).”

This research in PubMed yielded 105 articles on 20th September 2009. This large number of studies show that it contains a lot of searches. This large amount of data is too difficult to scrutinize.

For easiness, we will limit the section of PubMed in half. The search on “clinical queries” on “PubMed” showed 55 studies. It’s about half of the previous one, but is still lengthy to perform.

• **Synthesis** is second to the studies. It cosmists of systematic reviews on medical topics. The systematic reviews have a structured review of “clinical scenarios,” “appraises” and “summaries.”

However, the meta-analysis helps in the quantitative summarization and analysis of the interrelated studies.\(^8\)

The databases are very helpful in this regard. The “Medline and SCOPUS Index Systematic Reviews” are efficient to search the articles of the requirement. The “Cochrane Library” is well known for this procedure.

The **Cochrane library has three sections which are as follows:**

- Cochrane Database of Systematic Reviews (CDSR)
- Database of Abstracts of Reviews of Effects (DARE)
- Cochrane Central Register of Controlled Trials (CENTRAL)
- Randomized Controlled Trials (RCT)

• **Synopsis** comes next to the synthesis. This level consists of the advice and consultation of the experts on this result. The example of this study resources is a DARE section of “Cochrane library,” “ACP Journal Club” and “bandolier.”

• **Summaries** are the forth level of hierarchy. It collects all the data and makes them readable. It summarizes the data on studies, synthesis, and synopsis and makes a valuable summary. This summary is easy to read and understand. Some of the examples of summaries are as follows:

- NHS clinical knowledge summaries
- EBM textbooks

At the top of the hierarchy, the system comes. This system will integrate all the evidence about the scenarios and interlink the situation with that of the
information. Haynes can be effective in this regard. [10]

**Where the best evidence is available?**
To find out the best affirmation, one must check the top of the hierarchy. And if the search is unsuccessful, he can move towards the bottom. This approach will save the energy as well as the time of the researcher. Two most effective databases are as under:

- TRIP database
- SUM search

Some other search engines as described in the table

| Name of site                           | Type of resource |
|----------------------------------------|------------------|
| “Bandolier”                            | Synopsis         |
| “National guideline clearing house”    | Summary          |
| Trip database                          | Search engine    |
| Department of pediatrics               | Summary          |

After finding the evidence the next step is to evaluate the information. For this, the critical evaluation of literature is to be done.

**Critical evaluation of the literature:**
It is not necessary that all the data available in the literature are up-to-date or perfect. [16, 17] We need to scrutinize the best data among the whole raw data. A level of evidence is assigned and only the highest evidence studies are preferred. They are selected according to the clinical circumstances. [12, 13, 18] Oxford centers for attestation has issued some tables for different study designs. [19]

While evaluation, the two problems are needed to be addressed. Firstly, the results are valid or not? Secondly, are the findings appropriate and important or not? To find out these, numerous “checklists” are available online. [20,21]

**Are the answers/results valid or not?**
High quality, results should be obtained by scrutinizing the data. If the results are valid, then the next step should be the evaluation of the importance?

Here are some of the questions which are needed to be answered to check the validity.

**Was the assignment of patients to treatments randomized?**
What is the best?
“Centralized computer randomization is ideal and often used in multi-centered trials. Smaller trials may use an independent person (e.g., the hospital pharmacy) to “police” the randomization.”

Where do I need to find the information?
“The Methods should tell you how patients were allocated to groups and whether or not randomization was concealed”.

**Were the groups similar at the start of the trial?**
What is best?
“If the randomization process worked (that is, achieved comparable groups) the groups should be similar. The more similar the groups the better it is. There should be some indication of whether differences between groups are statistically significant (i.e. P values).”

Where do you search the data/information?
“The Results should have a table of “Baseline Characteristics” comparing the randomized groups on a number of variables that could affect the outcome (i.e. age, risk factors, etc.). If not, there may be a description of group similarity in the first paragraphs of the Results section.”

**What are the results? Are the findings important?**
For every clinical study, a lot of measures are available. Some of the software can easily find out different factors. For example, Absolute Risk Reduction, Relative Risk reduction, P-values, Number needed to treat, Relative Risk and their confidence interval.

The table shows the comparison of treatment group along with control groups in relation to the number of patients and number of patients.

| Sr. No | Number of events | Number of patients |
|--------|------------------|--------------------|
| Control group | c     | d              |
| Treatment group | a     | b              |
Relative Risk (RR):
“The relative risk means how likely it is that an event will be seen in the treatment group compared to the control group.”
Formula: \( RR = \frac{b}{a+b} / \frac{d}{c+d} \).
RR of 1 shows no therapeutic effect. RR <1 shows effective treatment.

Absolute Risk Reduction (ARR):
“It is the absolute difference in the rates of events between the treatment and control groups.”
Formula: \( ARR = \frac{d}{c+d} - \frac{b}{a+b} \)
ARR of “0” shows that treatment has zero effect.

Relative Risk Reduction (RRR):
“This is the most commonly reported measure of treatment effects (RRR=1-RR). It is the measure of reduction in the rate of the outcome in the treatment group compared to the control group.”

Number Needed to Treat (NNT):
“This is the number of patients one needs to treat to prevent one bad outcome or cause one additional good outcome.”
Formula: \( NNT = \frac{1}{ARR} \)
NNT of “1” show that the treatment is effective in all patients. NNT>1 shows ineffective treatment.

Confidence interval:
If a sample is small, the confidence level is broad. Cat maker software is used to calculate the C.I. 22

1. How to Implement the Findings to the Population?
The last step of this evidence-based medicine is the application of results to the patients. This can be interfered with the religious people, socio-economic groups or other ethical issues. 26
For example, the use of probiotics is expensive in Iran. For which it cannot be performed over there. 27
the soothing and painless processes are preferred by the pediatrics. 29

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