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META ANALYSIS: IN RESEARCH

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ABSTRACT

Meta analysis can be a powerful tool to combine results from studies with similar design and patient populations that are too small or underpowered individually to demonstrate a statistically significant association. As with clinical trials, having an appropriate study question and design are essential when performing a meta-analysis to ensure that there is internal validity and that the results are clinically meaningful. Heterogeneity among studies in study designs or patient populations is one of the most common flaws in meta-analyses. Heterogeneity can be avoided by thoughtful data abstraction performed by two or more authors who use a standardized data abstraction form. By applying a systematic approach to Meta analysis, many of the pitfalls can be avoided.

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INTRODUCTION

Meta analysis is a slightly differ from systemic review; it's a method for systematically combining of qualitative and quantitative study data from previously done several selected studies aim to develop a single conclusion which will have a greater statistical power due to increased number of subjects than a single study. The need to integrate findings from many studies ensures that meta-analytic research is desirable and the large body of research now generated makes the conduct of this research feasible [1].

Meta-analysis provides a standardized approach for examining the existing literature on a specific, possibly controversial, issue to determine whether a conclusion can be reached regarding the effect of a treatment or exposure [2].

Meaning of Meta analysis

- 1. Quantitative: numbers of subjects
- 2. Systematic: methodical examination
- 3. Combining: putting together all data

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Research Article

- 4. Previous research: what's already done
- 5. Conclusions: synthesize new knowledge

How to select a study for Meta analysis

Meta analysis statistically pools the conclusion from previously done various studies into a single quantitative result based on strong evidence. Study selection for Meta analysis includes following steps:

- 1. Identify studies (inclusion & exclusion criteria)
- 2. Exclude Studies (exclusion criteria)

3. Download and save the full text for the remaining research (inclusion criteria)

4. Assess the studies to see if they are near to Inclusion and Exclusion criteria

5. Keep only studies that fulfill all Inclusion criteria and No Exclusion Criteria

6. Eliminate remaining studies from Meta Analysis with logical reasoning

7. Accept the remaining studies (inclusion criteria) to initiate Meta Analysis

Key concept of Meta analysis are as follows Forest plots

Data for Meta analysis often is shown on visual plots, they are known as forest plots. When data can be pooled



in a meta-analysis, they will often be shown in actionpacked visual plots, they're called forest plots. Middle vertical line is the point of no effect, if results touch that line it indicate no significance. Understanding of confidence interval (CI) is a key concept in forest plot, it represent margin of error near to result. A confidence interval is our roughly estimation when someone asks us "how much time you require to complete your task" our answer may be, "it will take 10 to 20 minutes" instead of 15.

Strength of evidence

Each study might have used a different tool or measurement scale, e.g. in studies many question will have not asked, and quality of the data in the each study will tend to vary. This one is the major problem faced in metastasis by researcher.

Effect of statistical technique

There may be chances of confusion when questions of studies are not same or one may be recent one with important data set. To overcome these issues there should be a pre planned sensitive analysis. When we came to know that our one choice might influence the result, we can plan for alternative analysis.

Non uniform of meta-analyses

Many people use the terms "systematic review" and "meta-analysis" interchangeably. The major difference between systematic review and Meta analysis is synthesis of new knowledge after Meta analysis.

Absence of evidence is not truly an absence

Many time studies may not find evidence of

something, it doesn't mean that it not exist. It's very easy to conclude that there is no possibility after when more than one study remains empty on something.

Advantages

1. Inconsistency of results across studies can be quantified, analyzed and corrected.

2. Hypothesis testing can be applied on summary estimates.

3. Moderators can be included to explain variation between studies.

4. The presence of publication bias can be investigated.

Disadvantages

1. Meta-analysis may discourage large definitive trials.

2. Increases tendency to unwittingly mix different trials and ignore differences.

3. Potential for tension between meta-analyst and conductors of original trials may introduce biasness.

4. Meta-analysis of several small studies may not predict the results of a single large study.

5. Sources of bias are not controlled by the method.

6. A good meta-analysis of badly designed studies will still result in bad statistics.

CONCLUSION

Meta analysis offers a more systematic and quantitative approach to reviewing important therapeutic questions. For healthcare managers and clinicians, careful reviewing of published Meta analysis and a balanced assessment of their deficiencies is likely to become an increasingly important way of resolving therapeutic uncertainty [3].

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