ESTIMATING AND ADJUSTING FOR PUBLICATION BIAS OF VITAMIN A DEFICIENCY (VAD) IN META ANALYSIS

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INTRODUCTION

Meta Analysis is collection of data systematically and synthesizing the results from individual studies to estimate overall size. Studies with positive results are more likely to get published than those studies with negative results. By using only the results of more positive studies leads to publication bias. We have used different methods to detect this publication bias. The present study was started in the year 2008 which is aimed with the objective To estimate & detect the effect of publication bias in meta-analysis of vitamin A deficiency and adjusting for the bias.

OBJECTIVES

1. Meta Analysis of available published or unpublished information of three important Micronutrient Deficiency Disorders namely Vitamin A, Iron Deficiency Anemia(IDA) and Iodine Deficiency Disorders.
2. To study regional/ecological variations of these three micronutrient Deficiency Disorders in Rajasthan by systematic reviews and
3. To map out the districts for three micronutrient deficiencies in the western region.

MATERIALS AND METHOD

The data of meta analysis was collected through literature search for the Vitamin A Deficiency (VAD)Lakshminarayana, J. and Madhu B. Singh(2008). The systematic review of these meta analysis were carried out. The data consists of 15 publications to study the effect of Vitamin - A among school children. The duration was considered to be for a period of 10 years. We have used a binomial model to estimate the results and rank correlation method proposed by Begg and linear regression method proposed by Egger & Trim and Fill method to evaluate bias. The publication bias was adjusted by using “Trim & Fill method. The analysis was done using EPI META package³.

The effect size and the standard errors were calculated for all the studies and were depicted in the figures

METHODS FOR DETECTION OF PUBLICATION BIAS

Funnel plot, Begg’s Rank Correlation method
Egger’s and smith, 1997. Regression method
Trim and Fill method (which also adjust for publication bias.)

A funnel plot is a plot of each trial’s effect size against measure of its size, such as the precision, the overall sample size, or the standard error.
Trim and Fill Method

It is a method to evaluate bias in funnel plots.
Firstly, the number of “asymmetric” trials on the right side of the funnel is estimated.
It trims off or removes these trials from the funnel leaving a symmetric remainder to estimate the true center of the funnel. The trimmed trials are then replaced and their missing counterparts imputed or “filled”

RESULTS

The two sided P values from the methods of Begg and Eager are 0.04 and 0.05 indicating the possible existence of publication bias. By Trim & Fill method ignoring publication bias the fixed effect model was fitted to see the overall estimates of pooled Odds Ration is 1.16 with 95% CI (0.69, 1.82) Eager, M and smith GD (1985). A Funnel plot was plotted which Asymptotical, indicating the presence of publication bias was. When Trim & fill method was applied, one study which had missing variables was filled and we obtain an overall estimate of pooled odd ratio 0.98 with 95% CI (0.42, 1.56). The effect size and standard error were calculated for all the studies and depicted in the figure1 and 2. The figure 1 shows that there exists no publication bias and figure 2 shows studies with publication bias among the studies. The studies with publication bias the points show skewed distribution. If there is no publication bias the points show normal distributed (Funnel shaped).

Fig.1
CONCLUSION

The overall estimate of pooled odds ratio is reduced in the adjusted model. Thus this method gives reliable estimates and gave us the potential to derive and to see the incorrect conclusions drawn, if the publication bias do exists among the published studies. After correcting for bias by different models the over all conclusions could be drawn that the intervention studies are to be planned in the desert areas of Rajasthan for the improvement of the health of the people.

REFERENCES


