Quality of Antidepressant Drugs Research Articles
Published in Indian Medical Journals

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ABSTRACT

Aim and Objective: Quality of methodological and statistical parameters published in various Indian Medical Journals are usually debated in terms of appropriateness. Aim of this manuscript is to analyze and validate efficacy studies on antidepressant drugs published in Indian Medical Journals regarding quality of various methodological and statistical parameters used. Materials and Methods: An in-depth review of Efficacy studies on Antidepressant published in Indian Medical Journals was conducted. Articles were retrieved from all possible sources like Published Journals, downloaded through Pubmed, MedInd, OpenGate, Medknow, and Cochrane. These studies were analyzed and validated for various methodological and statistical parameters. Descriptive statistics for various parameters with confidence interval (CI) is also reported herewith. Results: Of 32 articles reviewed, primary and secondary endpoints and sample size calculation was reported in only one article (3.1%; 95% CI, 0.5 to 15.7%). Power and CI was not reported in any of the reviewed articles. Inclusion and exclusion criteria were reported in 9 (28.3%; 95% CI, 15.5 to 45.3%) articles. Information regarding randomization was mentioned in 12 (37.5%; 95% CI, 22.9 to 54.7%) articles, whereas reporting of blinding or open label status of the study was mentioned in 21 (65.6%; 95% CI, 48.3 to 79.5%) articles. Assumptions of statistical tests were not reported in any of the reviewed articles. Statistical tests were used in only 14 (43.7%; 95% CI, 28.1 to 60.6%) articles of which 70% of were inappropriate. All studies were underpowered for small and medium effect size. Conclusion: Quality of reporting of methodological and statistical aspects of antidepressant efficacy studies published in Indian medical journals are poor and hence makes difficult to conclude on issues related to validity of these studies.

Key words: Antidepressants, efficacy, Indian medical journals

INTRODUCTION

Clinical decisions for opting to an appropriate optimal treatment of patients are based on research done in the same area. Owing to busy schedule and infrequent continuous medical education, Clinicians usually come to know about the updates in respective subjects mainly through published articles published in journals. However, if the quality of published information in article is not up to the mark, it may impart incorrect or biased information to readers and that may affect optimal clinical decision making. Poor quality of published article may be because of either of two main reasons – one, study might not have been conducted properly, i.e., it may be poor methodologically, underpowered, use inappropriate statistics, etc., and second, all the parameters which can help authors to check validity of results are reported adequately in the published article.[1-5]

Depression is one of the common psychiatric disease and various antidepressants are tried for treatment of...
depression. Many studies are published in Indian Medical Journals regarding the efficacy of antidepressants in depression. Presently, no data are available reporting the quality of these studies, this initiated designing of present study with an aim of exploring quality and checking the validity of research articles published on antidepressant in Indian Medical Journals.

MATERIALS AND METHODS

Search strategy
A systematic search for the articles on Efficacy of Anti-Depressants published in Indian Journals was done. Articles were retrieved either in hard copies or in soft by use of database mainly Pubmed, Medind, OpenGate, Medknow, and Cochrane. Relevant article search was initiated based on initial article list obtained by different keywords as related relevant to fulfill the aims of present study and Medial Subject Heading terms were created. Bibliographic indices of articles obtained were again searched to find more related articles. “Related article” link given in Pubmed was also reviewed to search more relevant articles.

Inclusion criteria of studies
As per the aims of the present study, we included only those studies related to efficacy of antidepressant drug (clinical trials and clinical studies) which were conducted and published in Indian Medical Journals. Only full articles and Original Articles were included.

Exclusion criteria of studies
All Short communications, Letter to Editor, Editorials, Case reports, Commentaries, View Point, and Reviews were excluded. Antidepressant research done outside India and articles published in journals other than Indian journals were also excluded.

Development of instrument
Two-stage Delphi technique for Conesus development was utilized to develop the instrument. The participants of the two-stage Delphi included faculties from the department of Pharmacology, Psychiatry and Community Medicine. Consensus was build upon deciding issues related to reporting of clinical studies as well as methodology and reporting parameters. The final guideline check questions to validate reporting of primary and secondary endpoints, reporting of inclusion and exclusion criteria, sample size and power, reporting of randomization, reporting of blinding/open label, reporting of fulfilling of assumptions of statistical tests, reporting of confidence interval (CI), appropriateness of statistical tests, and post hoc power.

Results
A total of 32 articles as per the inclusion criteria were included in present study. Of these 32, 26 (81.2%; 95% CI, 64.6 to 91.15%) were clinical trials and 6 (18.7%; 95% CI, 8.8 to 33.3%) were clinical studies. Studies which mentioned “clinical trial” in title or in abstract or in material and method section were considered as clinical trials, rest were considered as clinical studies. Of these 32, 21 (65.6%; 95% CI, 48.3 to 79.5%) were positive studies and 11 (34.3%; 95% CI, 20.4 to 51.6%) were negative studies.

Of these 32 studies, information regarding primary and secondary endpoints were reported in only 1 (3.1%; 95% CI, 0.5 to 15.7%) article. Sample size calculation was reported in only 1 (3.1%; 95% CI, 0.5 to 15.7%) article. Average sample size was 24.4 per group. Most of the studies were having sample size less than 20

| Sample size | Studies |
|-------------|---------|
| <20         | 16 (50) |
| 21-40       | 11 (34.3)|
| 41-60       | 4 (12.5) |
| 61-80       | 1 (3.1)  |

Values in parenthesis are in percentage

Statistics
Descriptive statistics as frequency and percentages are used. 95% CI around the percentage are reported.

Table 1: Sample size in antidepressant drug efficacy studies
Fulfilling of assumptions of statistical tests was not mentioned by any of the reviewed article. In 10 articles (31.2%; 95% CI, 17.9 to 48.5%), statistical tests were not used and results were given just by observing descriptive statistics. In eight articles (25%; 95% CI, 13.2 to 42.1%), $P$ value was given but name of statistical test was not mentioned. In rest of the 14 articles (43.7%; 95% CI, 28.1 to 60.6%), statistical tests were used. Of these 14 articles, incorrect statistical test was used in 10 (71.4%) articles. Most common reason for inappropriate statistical test was use of parametric test for nonparametric data like score or scales. CI was reported in none of the 32 articles [Table 2].

On post hoc power calculation, it was observed that all studies were underpowered for small and medium effect size according to Cohen’s criteria. Only eight (25%; 95% CI, 13.2 to 42.1%) studies were found to be adequately powered (=or >80%) for large effect size.

**DISCUSSION**

Present study documents that the reporting of important parameters on the basis of which readers can assess the validity are deficient in published antidepressant efficacy studies as well as the methodology narrated on articles published in Indian Journals are not adequately done. Majority of the studies reviewed were underpowered and had use of inappropriate statistics and statistical tests. Hence, present study raises serious concerns on validity and scientific value of these studies.

One of the important observations of the present study is inappropriate reporting of various methodological parameters like primary and secondary endpoints, sample size calculation, inclusion and exclusion criteria, power, etc.; these parameters should be reported in detail so that readers can check the validity of published studies. Similar findings were observed in studies done for articles published in western and Indian journals.

A particular statistical test can only be used if all the assumptions of the statistical tests are fulfilled;[3,11] however, it was observed that fulfillment of assumption of statistical tests were not mentioned in any of the articles reviewed in present study. In many articles, statistical tests were not used and in many articles, names of statistical tests were not mentioned. In the articles where statistical tests were used, more than 70% statistical tests used were inappropriate. As compared with other studies published in Indian and western medical journals, rates of use of inappropriate statistical tests in present study are high.[2,4,9,12,14] Various reasons like researchers’, peer reviewers’, and editors’ poor knowledge of statistics and insufficient statistical review in ethics committee, etc., can be attributed to this high use of inappropriate statistical tests.[15]

Most of the studies were underpowered to document the actual difference between the groups and hence it raises methodological as well as ethical concerns. These studies because of insufficient power and poor statistics are scientifically useless and cannot justify the use of resources, deprivation of participants of these studies to normal established treatment.[16,17]

One of the limitations of present study is that the findings of these studies are based on only 32 articles. Study with more articles could have increased the validity further.

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**Table 2: Common reasons for inappropriate statistical tests**

| Reasons                                      | Frequency |
|----------------------------------------------|-----------|
| Parametric tests used for nonparametric data like scores/scales | 5 (50)    |
| Two group tests used for three and more groups | 2 (20)    |
| Unpaired test used for paired data           | 1 (10)    |
| Paired test used for unpaired data           | 1 (10)    |
| Three group test used for two groups         | 1 (10)    |

Values in parenthesis are in percentage; (n=10)
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