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Original Article

Assessment of Publications on Randomized Clinical Trials in Concordance With CONSORT Statement in a Teaching Tertiary Care Hospital

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Abstract

Objectives: To assess the quality of reporting of completed randomized clinical trials (RCTs) published between 2012 and 2015 using the CONSORT statement guidelines in Maulana Azad Medical College and Associated hospitals.

Methods: In this cross sectional retrospective observational study, RCTs conducted and published in the last 4 years were reviewed as per the CONSORT guidelines. RCTs published in indexed journals from 2012-2015 were included in the study. Case reports/case series/correspondence were excluded. The information regarding RCTs were collected from Institutional annual reports. The full texts were accessed from search engines like pubmed, medline, and google scholar or from the authors directly. Three reviewers were involved in review and scoring were given for each item enlisted in CONSORT statement. Out of 3 reviewers, 2 reviewer screened and reviewed RCTs and third reviewer was kept for delibration in case there is conflict of opinion

Results: Out of 121 RCTs, 28 completed and published RCTs in the last 4 years were identified and assessed for their adherence to CONSORT guidelines. In *methods* section, inconsistency and non adherence were observed for description for trial design (43%), sample size estimation (54%), randomization sequence generation (68%), allocation concealment mechanism (72%) and methods for subgroup analysis (50%) respectively. In Results, baseline data and participant flow diagram was presented in almost 90% of the studies. In discussion section, 71% of studies reported limitations and addressed sources of potential bias.

Conclusions: In this study, we observed that non adherence and suboptimal reporting was mainly observed in *Methods and Results* sections. Hence, sensitization of investigators/authors regarding significance of adherence to CONSORT statement must be undertaken to improve the standard of RCT reporting.

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Introduction

Reporting of randomized controlled trials (RCTs) in various medical journals in India has been non uniform and inconsistent with regard to study design, randomization, methodology, sample size estimation etc. RCTs are first line evidence which reflects ectiveness of pharmacological intervention. The information from these RCTs can be used for systematic reviews as well as meta-analyses. Transparency and systematic reporting of clinical trials brings clarity. So, the information should be appropriately and meticulously described in RCT reports not only for a valid interpretation of results but reproducibility too.

To overcome inconsistencies in reporting of RCTs, in 1993 thirty experts comprising of editors, epidemiologists, investigators met in Ottawa to draft scale for assessing quality of reporting RCTs. At the same time another group of experts was working in US. In 1996, both groups met in Chicago and the meeting resulted in genesis of Consolidated Standards for Reporting of Trials (CONSORT) statement. Since then it had been revised twice and finally in 2010, 25 items checklist and a flow diagram was released. CONSORT statement was developed to help improve the quality of RCT reports (1-3).

In the recent times, most of the journals in medicine endorse adherence to CONSORT and it is categorically mentioned under “Instructions to Authors” that manuscript should conform to CONSORT statement. The CONSORT statement provides a minimum set of recommendations for the reporting of RCTs and has been widely adopted and endorsed (4-6). It is the responsibility of author to draft manuscript for RCT as per CONSORT statement. This study was done to analyze, extent of adherence to CONSORT statement in published RCTs from our teaching tertiary care medical Institute (Maulana Azad Medical College & Associated Hospitals) in Delhi.

Material and Methods

Study design:

This was a retrospective cross sectional study in which RCTs conducted and published during 2012-2015 were considered for review. Data and information regarding publication were retrieved from Institutional Annual reports.

Data extraction

The full texts of published RCTs were accessed from search engines like pubmed, medline, and google scholar or from the authors directly. They were then reviewed as per the CONSORT guidelines.

Eligibility criteria:

Inclusion criteria

1. Randomized controlled trials published between 2012-2015
2. Original Articles published in Indexed journals

Exclusion criteria

1. Case reports/case series/correspondence
2. Articles Published in non-indexed journals

Each published article was reviewed by 2 independent reviewers who were involved in this study. Each item in CONSORT checklist was given a score (0: No and 1: Yes). In case of any conflict of opinion with regard to appropriateness of any item, discussions were held in presence of third expert and consensus was arrived. In addition to 25 items in checklist, article was also scored for whether ethics committee approval and informed consent was taken or not.

Data analysis

We used descriptive analysis for all evaluated

published articles. Overall number and proportions (%) were determined with regard to all 25 points in CONSORT checklist.

Results

A total of 121 studies were identified in published Institute's Annual report from 2012-15. After screening, 65 RCTs were shortlisted, out of which finally 28 RCTs met inclusion criteria (Fig. 1).

Section wise Analysis

Title and abstract – Out of 28 RCTs, 13(53.6%) were found to be identified as *randomized* clinical trial in the title. 27 (96 %) of RCTs presented structured summary of trial design, methods, results and conclusions in abstract.

Introduction – In this section, 24(85.7%) studies specified the scientific background and proper explanation of rationale was reported. Specific objectives or hypothesis were mentioned in 27(96.4%) studies.

Methods – Description of trial design was described in 16(57%) studies. On the contrary, all the studies i.e. 28(100%) elaborated the eligibility criteria for the participants along with complete description of interventions done. Pre-specified primary and secondary outcome measures were reported in 26(92.86%) studies. The sample size determination was reported in 13(46%) studies. The sequence generation for randomization was described in 19(68%) studies whereas in 10(35 %) studies blinding patterns was described (Table I). Allocation concealment mechanisms and its implementation were mentioned in 8(28.5%) studies. Statistical methods were adequately described in 27(96%) studies.

Results – The participant flow diagram including number of patients randomly assigned and analysis for primary outcome was projected in 21(75%) studies. Rest of parameters like recruitment, baseline data,

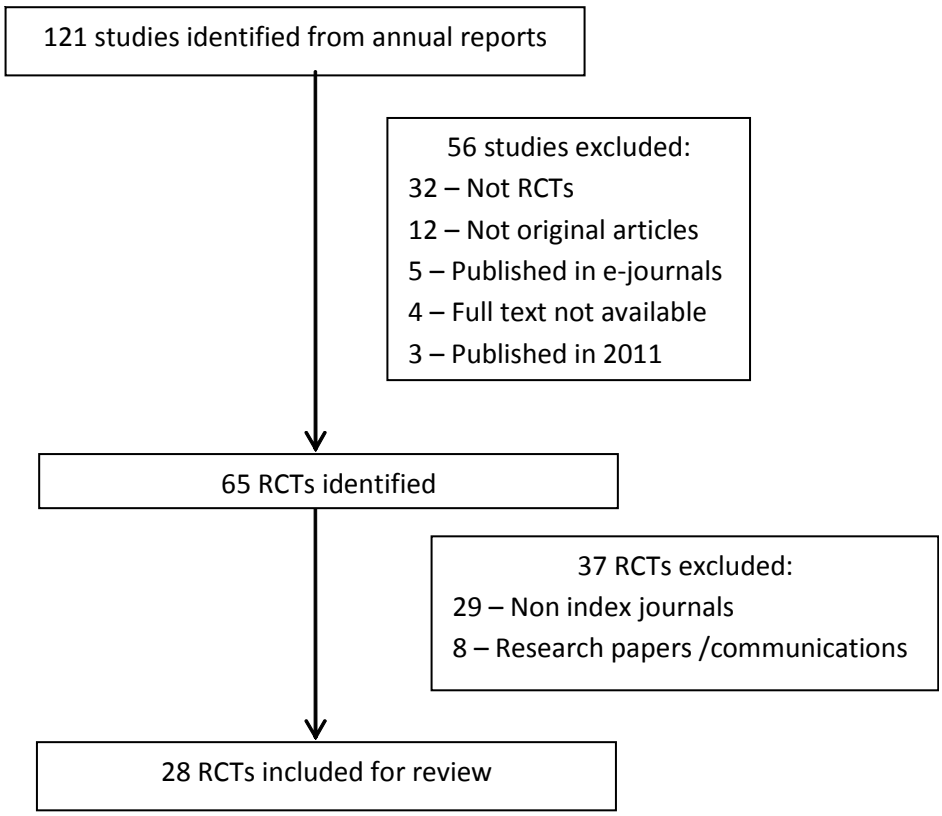

Fig. 1: Flowchart showing short listing of studies for review.

number analyzed, outcomes etc. are shown in Fig. 2, Table II.

Discussion – The trail limitations, generalizability of the trial findings and interpretation consistent with

TABLE I: CONSORT checklist for Methods.

Section/Topic	*Item*	*n=28 (%)*
Trial design	Description of trial design (such as parallel, factorial) including allocation ratio	16 (57.14)
	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	7 (25)
Participants	Eligibility criteria for participants	28 (100)
	Settings and locations where the data were collected	27 (96.43)
Interventions	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	28 (100)
Outcomes	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed	26 (92.86)
	Any changes to trial outcomes after the trial commenced, with reasons	5 (17.86)
Sample size	How sample size was determined	13 (46.43)
	When applicable, explanation of any interim analyses and stopping guidelines	3 (10.71)
Randomisation: Sequence generation	Method used to generate the random allocation sequence	19 (67.86)
	Type of randomisation; details of any restriction (such as blocking and block size)	9 (32.14)
Allocation concealment mechanism	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	8 (28.57)
Implementation	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	11 (64.71)
Blinding	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how	10 (35.71)
	If relevant, description of the similarity of intervention	5 (17.86)
Statistical methods	Statistical methods used to compare groups for primary and secondary outcomes	27 (96.43)
	Methods for additional analyses, such as subgroup analyses and adjusted analyses	14 (50)

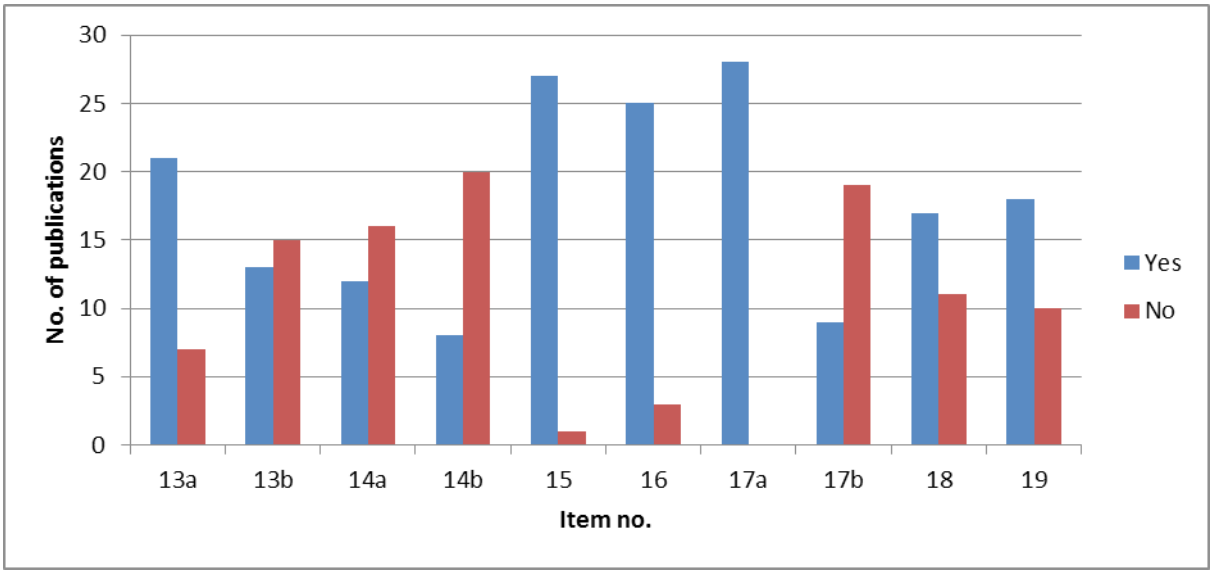

Fig. 2: Graph showing items under Results section (n=28).

TABLE II : CONSORT checklist for Results.

Section/Topic	*Item no.*	*Item*
Participant flow	13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome
	13b	For each group, losses and exclusions after randomisation, together with reasons
Recruitment	14a	Dates defining the periods of recruitment and follow-up
	14b	Why the trial ended or was stopped
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group
Numbers analysed	16	For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups
Outcomes and estimation	17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)
	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended
Ancillary analysis	18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory
Harms	19	All important harms or unintended effects in each group.

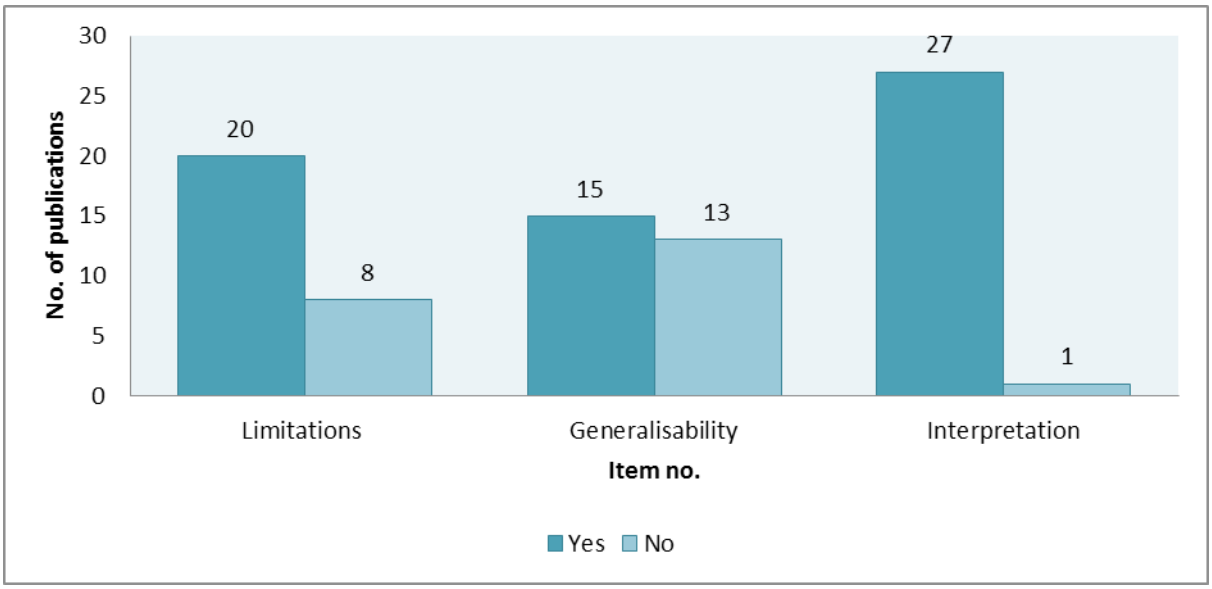

Fig. 3 : Graph showing items under Discussion section (n=28).

results (item no. 20, 21, 22 resp.) are shown in Fig. 3.

Other information – This section comprises of information with regard to 1) Registration of trial in clinical trial registry, only 2(7.14%) RCTs reported registration number in trial registry. 2) Information regarding the full text protocol access, the information for the same was reported in 8(28.5%) studies. 3) The source of funding was reported in 10(35.7%) published RCTs (Table III). We also observed that in all the studies, Ethics committee approval was taken and it was mentioned under Study design section. Information with regard to Informed consent was presented only in 11(39%) of studies.

TABLE III : Other information.

Section/Topic	*Reported n=28 (%)*
Registration of trial	2 (7%)
Protocol access	8 (29%)
Source of funding	10 (36%)

Discussion

In our study, we analyzed published RCTs from our Institute for adherence to Consort statement. Our objective was to generate evidence with regard to quality of reporting of RCTs from our Institute which may serve as feedback or eyeopener for authors. We opted for having 3 reviewers, out of which 2 reviewers evaluated published articles independently whereas third reviewer was for deliberation. We found that the word *randomized* was missing in title in 47% of the studies whereas *abstract* were presented as structured summary in almost all studies (96%) in concordance with CONSORT statement. This finding was in contrast to earlier study done for Abstracts published in Korean Journal of Anesthesiology, wherein 53% of studies only matched CONSORT criteria (7).

In another study, wherein comparison of RCTs abstracts was done among 4 reputed medical journals (BMJ, NEJM, JAMA and The Lancet), it was observed that half of the abstracts identified the study as randomized in the title (58.7%), reported specific objective/hypothesis (72.7%) and clearly defined the primary outcome (94.8%) (8).

In the section of *Introduction*, background and objectives were clearly defined in almost 90% of studies. In *methods* section, inconsistency and non-adherence were observed for description for trial design (43%), sample size estimation (54%), randomization sequence generation (68%), allocation concealment mechanism (72%) and methods for subgroup analysis (50%) respectively. Similar findings have been documented in earlier published study and authors stated that if allocation concealment is inadequate, RCTs tend to report approximately 40% more overstated treatment effects (9).

In a retrospective cross sectional data analysis wherein 319 RCTs were analyzed for adherence to CONSORT statement, it was observed that only 72.1% of the articles presented clearly defined primary and secondary outcome parameters and RCTs satisfied a median of 60.0% of the CONSORT criteria (10).

Under *results* sections, non-adherence was observed with regard to Participant flow wherein only 46% of studies reported losses and exclusions after randomization, 64% studies reported harms or unintended effects in each group. Baseline data and participant flow diagram was presented in almost 90% of the studies. We observed that for binary outcomes, information with regard to effect size was reported in 32% of studies. In a systematic review, where 105 RCTs on bipolar disorder were analyzed and it was found that the effect size was reported in 18% of studies and the number needed to treat in 8% of studies (11).

In d*iscussion* section, 71% of studies reported limitations and addressed sources of potential bias, as far as *other information* is concerned, only 7% of studies reported registration number of trial registry and 35% of studies mentioned source of funding. 28% of studies reported information regarding full text access of protocol. Reporting of registration number gives authenticity to trial and makes data transparent to public. Information regarding full text protocol access can help to restrict the likelihood of undeclared post hoc changes to the trial methods and selective outcome reporting. Also, some readers believe that sponsored studies usually report results in favor of their product. Hence, source of funding should be reported with role of funding agency in study.

We observed that still we have a long way to go as inconsistencies in reporting with regard to CONSORT exists. Non adherence and suboptimal reporting was mainly observed in *Methods and Results* sections. In a comparative study, it was observed that reporting of *methods* was better in the clinical trial registry (India) than in Indian journals hence authors stated that the suboptimal compliance with CONSORT in RCTs published in Indian journals reduces credibility of outcome (12).

There is paucity of data regarding adherence to

CONSORT statement for reporting of RCTs in India. Observations of our study can serve as pilot tool for sensitizing authors with importance of adherence to CONNSORT.

Limitations

Since we only opted for last 4 years of published RCTs, our sample size was less. Moreover, evaluation of Journal's adherence to CONSORT was not determined. Hence, comparison between different journals with regard to adherence to CONSORT could not be undertaken.

Conclusion

Authors are responsible for conforming to the higher standards outlined by the CONSORT statement but at the same time journals should lay down strict policy for non-conformers. Also, Investigators, faculty and postgraduate students should be sensitized and trained adequately in manuscript writing along with critical evaluation of RCTs as per CONSORT statement.

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