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«Μεθοδολογία Βιοϊατρικής Έρευνας, Βιοστατιστική και Κλινική Βιοπληροφορική»

Assess the reporting quality of RCTs for - myelodysplastic syndromes (MDS) using the CONSORT statement.

Αξιολόγηση της ποιότητας αναφοράς των τυχαιοποιημένων ελεγχόμενων κλινικών δοκιμών για τα μυελοδυσπλαστικά σύνδρομα (ΜΔΣ) με τη χρήση της δήλωσης CONSORT.

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Abstract

Background

The purpose of this study is to assess the reporting quality of RCTs involving patients with myelodysplastic syndromes (MDS) using a standardized tool based on the Consolidated Standards of Reporting Trials (CONSORT) statement. The CONSORT statement improves the quality of reporting of randomized controlled trials (RCTs) and encouraged the conduct of high-quality unbiased RCTs.

Objective

The evaluation of reporting standards of Randomized Control Trials (RCTs) for Myelodysplastic syndromes based on CONSORT statement.

Methods

Electronic databases and more specific PubMed were searched for English language RCTs involving patients with Myelodysplastic Syndromes published from 2016 to 2021. Trials were considered acceptable when the selected patients were randomly assigned to at least two treatment arms. Quality of reporting was assessed using a 25-items questionnaire based on the revised CONSORT 2010 checklist.

Results

The search on PubMed identified 41 articles and eleven (11) of them were selected as considered more suitable. These RCTs were published in high-ranked medical journal, but only one study had more than 75% CONSORT score, while the mean of CONSORT score was 60%.

Conclusion

Reporting quality of RCTs for MDS is not satisfactory. Further improvement of reporting is required.

Keywords: CONSORT, Randomized Controlled Trials, Myelodysplastic syndromes, Acute Myeloid leukemia

Abbreviations:

AML Acute Myeloid Leukemia

CMML Chronic Myelomonocytic Leukemia

CONSORT Consolidated Standards of Reporting Trials

MDS Myelodysplastic Syndromes

RCT Randomized Controlled Trials

IF Impact Factor

Περίληψη

Εισαγωγή

Σκοπός της εργασίας είναι η αξιολόγηση της ποιότητας αναφοράς των τυχαιοποιημένων κλινικών δοκιμών (RCTs) για τα μυελοδυσπλαστικά σύνδρομα (MDS) με τη βοήθεια της χρήσης του CONSORT statement, το οποίο βελτιώνει τη ποιότητα των τυχαιοποιημένων κλινικών μελετών και είναι το καλύτερο εργαλείο για την αξιολόγηση τους.

Σκοπός

Η αξιολόγηση των τυχαιοποιημένων κλινικών μελετών (RCTs) για τα μυελοδυσπλαστικά σύνδρομα με τη προσέγγιση του CONSORT statement.

Μέθοδοι

Χρησιμοποιήθηκαν ηλεκτρονικές βάσεις δεδομένων και πιο συγκεκριμένα η PubMed, για την εύρεση τυχαιοποιημένων κλινικών μελετών γραμμένες στην αγγλική γλώσσα που αφορούσαν θεραπείες για μυελοδυσπλαστικά σύνδρομα, οι οποίες δημοσιεύτηκαν τη χρονική περίοδο 2016 – 2021. Οι κλινικές μελέτες που κρίθηκαν κατάλληλες μελέτης, περιείχαν ασθενείς που είχαν τυχαιοποιηθεί σε δύο τουλάχιστον ομάδες θεραπείας. Για την αξιολόγηση της ποιότητας των άρθρων έγινε χρήση του ερωτηματολογίου CONSORT checklist 2010 με τις 25 ερωτήσεις.

Αποτελέσματα

Η αναζήτηση στο PubMed βρήκε 41 αποτελέσματα, από τα οποία επιλέχθηκαν τα 11 ως πιο κατάλληλα. Οι 11 τυχαιοποιημένες μελέτες είχαν δημοσιευθεί σε υψηλής κατάταξης επιστημονικά περιοδικά, αλλά μόνο μία μελέτη είχε από 75% και πάνω CONSORT score. Ο μέσος όρος των υπόλοιπων μελετών ήταν περίπου στο 60%.

Συμπέρασμα

Η αξιολόγηση της ποιότητας αναφοράς των τυχαιοποιημένων κλινικών δοκιμών (RCTs) για τα μυελοδυσπλαστικά σύνδρομα (MDS) δεν είναι ικανοποιητική. Απαιτούνται περισσότερες βελτιώσεις.

Λέξεις κλειδιά: CONSORT, Randomized Controlled Trials, Μυελοσπονδυλικά σύνδρομα, Οξεία μυελογενής λευχαιμία

Introduction

For more than 50 years, Randomized Controlled Trials are used for treatment trials and it is recognized as the most suitable method to regulate the justify of interventions. Nowadays, RCT is considered the "gold standard" both in evaluation of healthcare interventions and research plan, as it is needed to make sure that medical research is approached to the highest feasible standards [10]. RCTs layout restrains bias and endorse blinding of participants.

Underprivileged reporting of RCTs may occur to wasting time and misleading in research process. Reviewers of published RCTs need entire and precise data on a trial's steps and findings, in order to be able to access them accordingly [8].

The CONSORT statement is an evidence-based approach to check the standards of RCTs. It was published in 1996, then was revised in 2001 and the latest version is 2010. CONSORT 2010 was developed through collaboration of journal editors, clinical trials experts, statisticians, epidemiologists and guideline developers [13]. The main aim of CONSORT statement was to improve the quality of parallel groups on RCTs through 25 prerequisite statements on checklist, which must be accompanied on each RCTs. The checklist items consist of Title and Abstract, Introduction, Methods, Results, Discussion and Other information regarding protocol and registry. These items allow the reviewer to understand each stage of trial (design, analysis, results) Omission of any of 25 checklist items, may be correlated with biased evaluations of treatment or maybe the information is related to access the accuracy of the findings. It is highly recommended CONSORT checklist to be used in every RCT. The CONSORT statement apart from checklist consists of a flow diagram as well, which depicts the progress through the phases of RCTs [11].

The truth is that CONSORT statement is preferred by the majority of scientific journals, in order to ensure transparency [12].

The aim of this study is to access the reporting quality of RCTs for myelodysplastic syndromes, in articles published from 2016 to 2021. The evaluation tool was CONSORT 2010 checklist.

Material and Methods

Data Sources and Search Strategies

The data of this study were retrieved by an electronic structured search in PubMed. Through this search, the results had to be checked, in order to identify if they would be suitable for inclusion to the study. The search criteria on PubMed were the keywords "Myelodysplastic Syndromes" and "treatment". In addition, the following filters were used: the RCTs for type of article, the last five (5) years for publication date, Human for species, English for language.

Eligibility of studies

Trials were considered eligible if the participants of study had been randomly assigned to at least two treatment arms and suffer from myelodysplastic syndromes.

Exclusion criteria were studies in other languages except for English. Moreover, article types other than RCTs, such as meta-analysis, review and systematic review. Animal studies, abstracts, non-randomized control trials and published studies earlier than 2016 were not considered eligible.

Reporting assessment tool

The evaluation of the reporting quality of the eligibility of RCTs was performed with CONSORT 2010 checklist (http://www.consort-statement.org/), which consists of 25 items with sub-items, 37 total. The CONSORT explanation and elaboration document was used as well [14]. Due to limited published date, during the last five years, all the extracted studies were published after the last revision of CONSORT 2010. After the selection of articles, the CONSORT checklist had to be filled with whether the item was stated in subject study or not. In case, that an item was spotted in another section of study or the response was not clear, it was considered as a negative reply.

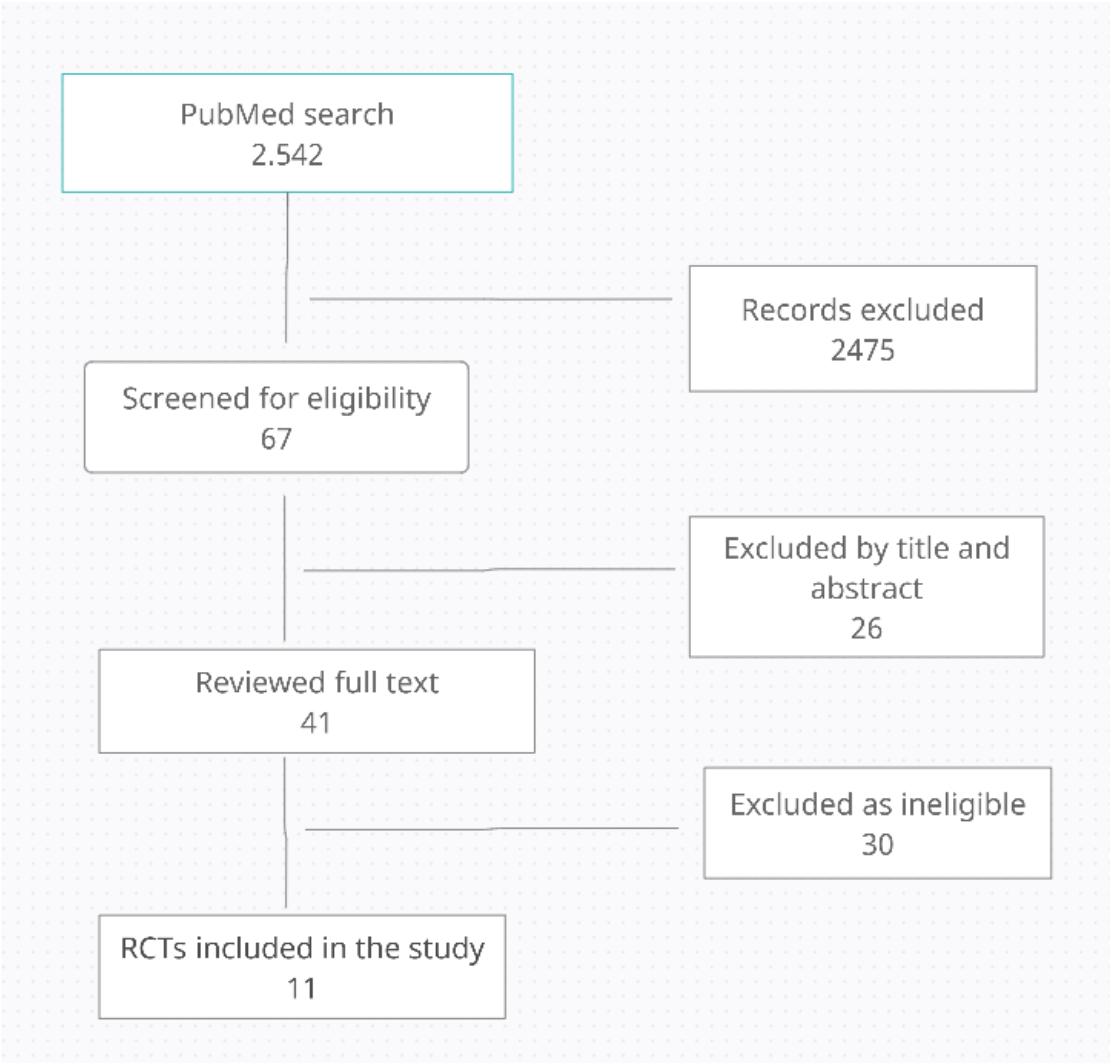
Statistical Analysis

All articles read in depth, in order the CONSORT statement checklist to be filled accordingly. CONSORT scored is also calculated, how many items have been reported in each article (Table 1). Articles have been divided into two groups based on IF of medical journal, that the selected studies have been published. The cut off point was considered the median of IF. T-test for independent samples was performed to assess if there is statistically significant difference between the CONSORT score and Impact Factor. A p-value less than 0.05 is considered significant. Statistical analysis performed using Statistical Program for Social Sciences (SPSS).

Results

The initial search in PubMed retrieved 2.542 results of which 2.475 records excluded due to the fact that they were not RCTs. Most of them were Meta-Analysis, Reviews and Systematic Reviews. Then 26 articles were excluded after title and abstract were evaluated for eligibility. Finally, 41 articles which were fully reviewed. 30 studies were considered ineligible, because the participants of study have not been randomly assigned to at least two treatment arms, as a result only 11 RCTs included in the study (Figure 1.)

Figure 1. Flow diagram



The selected articles were published in 7 different scientific journals with a range of Impact Factor (IF) from 4.4 to 44.54. The assessment of RCTs along with Journal, Impact Factor, publication year and Consort Score are presented in **Table 1**. If we could consider the 75% a very good Consort Score, then only one study met the requirement. The mean of Consort score is around 60%.

Table 1. RCTs information about Impact Factor, Journal and Publication Year

RCT	Publication Year	Journal	IF	Consort score

U Platzbecker et al.	2017	Nature	42.78	21/37 (57%)
B Oran et al.	2020	Blood Advances	4.9	23/37 (62%)
P Fenaux et al.	2018	Springer Nature	8.665	19/37 (51%)
J Seymour et.al.	2017	BMC Cancer	4.4	20/37 (54%)
N Kroger et.al.	2017	Journal of Clinical Oncology	44.54	22/37 (60%)
J Cortes et.al.	2019	Springer Nature	8.665	19/37 (51%)
M Sekeres et.al.	2017	Journal of Clinical Oncology	44.54	21/37 (57%)
R Brodsky et.al.	2021	Hematologica	7.75	20/37 (54%)
G Garcia-Manero et.al.	2017	Cancer	6.072	30/37 (81%)
M Kenealy et. al.	2019	Hematologica	7.75	26/37 (70%)
T Lin et.al.	2021	Blood Advances	4.9	21/37 (57%)

In **Table 2**. the analytical results of each article on Consort 2010 Checklist are presented. The Abstract and Trial design, Recruitment, Outcomes and estimation were reported in 100% of the articles. The Objectives, Statistical methods and Sample size are stated in 91% of the selected studies, while the Title, the Background, the Eligibility criteria, the Baseline data were reported in more than 70% of the RCTs. On the other hand, the Protocol and Implementation had the lower score 9%.

Table 2. Analytical Results - Consort Checklist (1=Yes, 0=No)

Item	RCT 1	RCT 2	RCT 3	RCT 4	RCT 5	RCT 6	RCT 7	RCT 8	RCT 9	RCT 10	RCT 11	Total (%)
1a Title	1	1	1	0	0	1	1	0	1	1	1	8 (73%)
1b Abstract	1	1	1	1	1	1	1	1	1	1	1	11 (100%)
2a Background	0	1	0	1	1	1	1	1	1	1	1	9 (82%)
2b Objectives	1	1	1	1	0	1	1	1	1	1	1	10 (91%)
3a Trial design	1	1	1	1	1	1	1	1	1	1	1	11 (100%)
3b Changes to methods	1	0	1	1	1	0	0	0	1	0	1	6 (55%)
4a Eligibility criteria	0	1	1	0	1	1	1	1	1	1	1	9 (82%)
4b Settings	1	0	0	0	0	0	0	0	0	0	1	2 (19%)
5 Interventions	0	1	0	1	0	0	0	1	1	0	0	4 (36%)
6a Outcomes	1	0	1	0	1	1	0	0	1	0	1	6 (55%)
6b Changes to outcome	1	0	0	1	0	0	0	0	1	0	0	3 (27%)
7a Sample size	0	1	1	1	1	1	1	1	1	1	1	10 (91%)
7b Interim analysis	1	1	1	0	1	0	0	1	1	0	0	6 (55%)
8a Allocation sequence	0	1	0	0	1	0	1	1	1	1	1	7 (64%)

8b Type of randomization	1	1	1	1	1	0	0	0	1	1	1	8 (73%)
9 Allocation concealment	1	0	0	0	0	0	0	0	1	0	0	2 (19%)
10 Implementation	1	0	0	0	0	0	0	0	0	0	0	1 (9%)
11a Blinding	0	0	0	0	0	0	1	0	1	0	0	2 (19%)
11b Similarity of Interventions	1	0	0	0	0	0	0	0	0	0	0	1 (9%)
12a Statistical methods	0	1	1	1	1	1	1	1	1	1	1	10 (91%)
12b Statistical analysis	1	1	1	0	1	0	1	0	1	0	0	6 (55%)
13a Participant flow	0	1	1	1	1	1	1	1	1	1	1	10 (91%)
13b Losses and exclusions	1	1	1	1	1	0	1	0	0	0	0	6 (55%)
14a Recruitment	1	1	1	1	1	1	1	1	1	1	1	11 (100%)
14b Trial end	0	0	0	0	0	0	0	0	0	0	1	1 (9%)
15 Baseline data	1	0	0	1	1	1	1	1	1	1	1	9 (82%)
16 Numbers analysed	1	0	1	1	1	1	1	1	1	0	1	9 (82%)
17a Outcomes and estimation	1	1	1	1	1	1	1	1	1	1	1	11 (100%)
17b Binary outcomes	0	1	0	0	1	1	0	1	0	0	0	4 (36%)
18 Ancillary Analyses	0	0	0	0	1	1	0	1	1	1	1	6 (55%)
19 Harms	1	1	0	1	1	1	1	0	1	1	1	9 (82%)
20 Limitations	0	1	0	0	0	1	1	1	1	0	0	5 (45%)
21 Generalisability	0	0	0	0	1	1	1	1	1	1	0	6 (55%)
22 Interpretation	1	1	0	1	1	1	1	0	1	1	1	9 (82%)
23 Registration	0	1	0	1	1	0	0	1	1	0	0	5 (45%)
24 Protocol	0	0	0	0	1	0	0	0	0	0	0	1 (9%)
25 Funding	0	1	1	1	1	1	1	1	1	1	0	9 (82%)

The median of Impact Factor of Journal is 7.75 (**Figure 2**.). It is found that there is no significant difference in studies that published in medical journals with IF < 7.75 (p= 0.132 > 0.05) (**Table 3**.).

Figure 2. Statistic Review

Impact Factor

N Valid	11
Missing	0

Mean	16,8147
Median	7,7500
Std. Deviation	17,49916

Table 3. Independent Sample Test

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
ConsortScore Equal variances assumed	9,402	0,013	1,599	9	0,144	9,467	5,920	-3,925	22,858
ConsortScore Equal variances not assumed			1,736	6,181	0,132	9,467	5,454	-3,786	22,719

Discussion

The purpose of this study is to evaluate the quality reporting of the RCTs for Myelodysplastic Syndromes with respect to CONSORT 2010 checklist (37 items). Eleven (11) studies were included in the present analysis and only one article had more than 75% CONSORT score. Also 14 out of 37 checklist items (38%) achieved more that 75% in these 11 RCTs. Not mention the fact, that there were items with less than 10% on our studies, like 14b (Why the trial ended or stopped). Even if the study referred to last 5 years of subject RCTs (from 2016 – 2021), 6 years from the updated CONSORT statement, it seems that improvements are needed.

The present analysis study assesses the reporting quality of RCTs for Myelodysplastic Syndromes, based on articles that published since 2016 up today. It is noticed that the retrieved articles did not follow the CONSORT statement checklist. To be more precise, only one out of eleven articles had a very good Consort score. Most of the articles did not satisfy the criteria.

The selected RCTs were published to medical journals that had from good to excellent IF. After the subgroup of RCTs, based on median IF, significant difference was not found.

The CONSORT statement adoption by medical journal, would urge the authors to report transparent and complete all the findings of their studies [13].

The main strength of this study is that all the selected RCTs can be easily accessed in PubMed database and the CONSORT statement can be easily and free found on search engines.

Of course, the study has some limitations. Firstly, there was period range from 2016 to 2021. Moreover, considered as accepted only the articles that were written in English language. Some journals had published more than one of the selected RCTs and it may be considered as bias. Last but not least, each study may have a different weight in each Consort statement checklist (i.e. flow diagram, blinding), which is not taken under consideration in subject study.

Conclusion

To sum up, it can be concluded from this study, that that the reporting quality of RCTs for Myelodysplastic syndromes is quite low. However, there are some limitations that should be taken under consideration, such as the English language and the different weight on each Consort statement checklist for each RCTs that is not evaluated in subject study. Even if the Impact Factor of medicine journals that published the RCTs is high, seems that the mean of them, meet only the 60% of CONSORT score. All the information stated in CONSORT statement checklist is important not only for the Researchers, but for the whole medical industry and any omission may mislead the purpose of study and may considered waste of time. However, it is highly recommended, the medical journals to urge authors to adhere to CONSORT statement checklist. Only if the Consort criteria are met, there will be transparency of findings and areas like methodology and results will be improved and will be considered reliable.

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