SCHOOL OF MEDICINE, UNIVERSITY OF THESSALY
POSTGRADUATE PROGRAMME (MSc) IN
"RESEARCH METHODOLOGY IN BIOMEDICINE, BIOSTATISTICS AND CLINICAL BIOINFORMATICS"

Master's Thesis

"ASSESSMENT OF THE REPORTING QUALITY OF RANDOMIZED CLINICAL TRIALS FOR PHOTODYNAMIC OR LASER DIODE THERAPY IN PERIODONTITIS PUBLISHED FROM 1.1.2013 TO 30.6.2018, BY MEANS OF THE CONSORT 2010 STATEMENT"

"Αξιολόγηση της ποιότητας καταγραφής των Τυχαιοποιημένων Κλινικών Δοκιμών για την Φωτοδυναμική ή την θεραπεία με Διοδικό Laser στην περιοδοντίτιδα κατά την χρονική περίοδο 1.1.2013-30.6.2018, με την χρήση της δήλωσης CONSORT 2010".

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ABSTRACT

Background: After the publication of the CONSORT 2010 statement, no studies have been conducted to assess the reporting quality of randomized clinical trials (RCTs) regarding the impact of Photodynamic (PDT) or Laser diode therapy (LR) therapy in periodontitis.
Objective: To investigate the reporting quality of relevant RCTs in Pub Med during the period 1.1.2013-30.6.2018.
Materials and methods: 18 relevant RCTs were selected among 191. Eligible RCTs included patients with chronic periodontitis randomly assigned to at least 2 therapies, one of which was PDT or LR therapy either primarily or adjunctively. Articles not written in English, involving animals or open flap (surgical) therapy or split mouth (SM) design or focusing only on microbiological and/or biochemical parameters, in vitro studies and study protocols were excluded. Reporting quality assessment was conducted using a modified CONSORT 2010 item checklist. Articles were separated into those published in journals endorsing the CONSORT (C) statement and those that are not (NC).
Results: A mean CONSORT Compliance score (CCS) of 54.8% (46.9, 62.6%), (S.D=15.8) was calculated for the selected RCTs. Statistically significant difference was found between the percentages of C and NC articles achieving more than 65% CCS: RR=25, (1.8, 346.7). No significant differences between 2 groups in the number of items per each section (*Title-Abstract, Introduction, etc.*) reported by the 75% of the articles in each group was found. 'Dental' journals achieved a significantly higher CCS than 'General scientific' journals. [Mean Difference, MD = 18.4% (5.89, 30.91%)]. No differences were found across RCTs originating from different continents or published every year.
Limitations: The amount of the available RCTs was limited. Assessment was conducted by a single investigator.
Conclusions: The reporting quality of the RCTs for photodynamic or laser diode therapy in periodontitis is suboptimal. CONSORT articles achieved better Compliance scores than NO CONSORT. Further RCT reporting enhancement will advance both clinical research and every-day practice.

Keywords: RCT, Reporting Quality Assessment, Periodontitis, Photodynamic therapy, Laser, CONSORT
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ΠΕΡΙΛΗΨΗ

Εισαγωγή: Μετά από την δημοσίευση της δήλωσης CONSORT 2010 δεν υπάρχουν μελέτες που να αξιολογούν την ποιότητα καταγραφής των Τυχαιοποιημένων Κλινικών Δοκιμών (ΤΚΔ) για την Φωτοδυναμική (ΦΔΘ) ή την θεραπεία με Διοδικό Laser (ΔΛ) και την επίδρασή της στις κλινικές παραμέτρους της περιοδοντίτιδας.
Σκοπός: Η διερεύνηση της ποιότητας αναφοράς των σχετικών ΤΚΔ που ανευρέθηκαν στο PubMed κατά την χρονική περίοδο 1.1.2013-30.6.2018.

Μέθοδοι: Επιλέχθηκαν 18 ΤΚΔ από συνολικά 191 μελέτες. Προϋποθέσεις επιλογής ήταν οι ΤΚΔ να είναι γραμμένες στην αγγλική γλώσσα και να περιλαμβάνουν ασθενείς με χρόνια περιοδοντίτιδα οι οποίοι τυχαία χωρίστηκαν σε δύο ομάδες τουλάχιστον, σε μία εκ των οποίων εφαρμόστηκε θεραπευτικά ΦΔΘ ή ΔΛ (κύρια ή επικουρικά). Δεν συμπεριλήφθηκαν μελέτες σε ζώα ή 'In vitro', θεραπευτικά πρωτόκολλα, καθώς και ΤΚΔ με σχεδιασμό Split Mouth, (SM) ή που αφορούσαν χειρουργική αντιμετώπιση της περιοδοντίτιδας ή που επικεντρώνονταν αποκλειστικά στις μικροβιολογικές ή και βιοχημικές παραμέτρους της νόσου. Η αξιολόγηση των ΤΚΔ έγινε με την χρήση τροποποιημένης λίστας στοιχείων CONSORT 2010. Οι μελέτες χωρίστηκαν σε αυτές που δημοσιεύτηκαν σε περιοδικά που στηρίζουν την δήλωση CONSORT (C) και σε αυτά που δεν την στηρίζουν (NC) και πραγματοποιήθηκαν συγκρίσεις μεταξύ τους.
Αποτελέσματα: Ο μέσος όρος της βαθμολογίας (CCS) που συγκέντρωσαν οι συμπεριληφθείσες ΤΚΔ ήταν 54.8% (46.9, 62.6%), (T.A=15.8). Στατιστικά σημαντική διαφορά βρέθηκε μεταξύ των ποσοστών των C και NC άρθρων που συγκέντρωσαν CCS μεγαλύτερο από 65%: RR=25, (1.8, 346.7). Δεν υπήρχαν σημαντικές διαφορές μεταξύ των δύο ομάδων στον αριθμό των στοιχείων της λίστας ανά τμήμα άρθρου (*Τίτλος-Απόσπασμα, Εισαγωγή, κλπ.*) που αναφέρθηκαν από το 75% των εργασιών κάθε ομάδας. Τα 'Οδοντιατρικά' περιοδικά συγκέντρωσαν στατιστικά σημαντικά μεγαλύτερο CCS σχετικά με τα άλλα 'Γενικού επιστημονικού ενδιαφέροντος' περιοδικά: [Διαφορά Μέσου Όρου, Δ.Μ.Ο. = 18.4% (5.89, 30.91%)]. Δεν ανευρέθηκαν διαφορές ανάμεσα στις ΤΚΔ που προέρχονταν από διαφορετικές ηπείρους ή που δημοσιεύτηκαν την κάθε χρονιά, όσον αφορά το CCS.
Περιορισμοί: Ο αριθμός των διαθέσιμων ΤΚΔ ήταν περιορισμένος. Η αξιολόγηση πραγματοποιήθηκε από έναν ερευνητή.
Συμπεράσματα: Η ποιότητα καταγραφής των μελετών για την ΦΔΘ/ΔΛ θεραπεία στην περιοδοντίτιδα είναι χαμηλή. Τα C άρθρα πέτυχαν καλύτερο CCS σε σχέση με τα NC. Περαιτέρω βελτίωση της ποιότητας αναφοράς των ΤΚΔ θα προάγει την κλινική έρευνα και πρακτική.

Λέξεις-Κλειδιά: Τυχαιοποιημένη κλινική μελέτη, Αξιολόγηση ποιότητας καταγραφής, Περιοδοντίτιδα, Φωτοδυναμική θεραπεία, Laser, CONSORT
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INTRODUCTION

A right clinical decision can be reached by having access to reliable meta-analyses, as well as to carefully planned, well-conducted and free of bias clinical trials. Proper clinical trial selection is also a prerequisite for definitive meta-analyses. RCT is a study design that randomly assigns participants into an experimental group or to a control group (*Himmeralb Health Sciences Library, 2011*). It is considered to be the ideal type of clinical research to examine the effectiveness of treatment interventions in health sciences (Higgins et al, 2011) by ensuring that treatment and control groups are comparable in respect of prognosis and responsiveness to treatment (*Kleijnen J et al in: Maynard A, 1997)* and thus preventing bias. Evidence-based hierarchies place RCTs just below systematic reviews as the highest form of evidence (*Concato et al. 2000; Turner et*

al. 2012; Fleming et al. 2012). Nevertheless, there are indications in the bibliography that the quality of many RCTs is inadequate. (*Ravindranath et al, 2006, Rios et al, 2008, Turner et al, 2012).*

Thorough and accurate reporting advances RCTs' evaluation (*Williams 2010*) and enables their reproducibility. Compliance with a framework of certain recommendations, formulated by common consent and expected to be strictly reported in scientific journals, is considered to enhance the quality of RCT reporting (*Der Simonian et al*, 1982). The CONSORT statement is an evidence-based, minimum set of guidelines for reporting randomized trials. It offers a standard way for authors to prepare reports of trial findings, facilitating their complete and transparent reporting, and aiding their critical appraisal and interpretation *(http://www.consort-statement.org/)*. It was originally published in 1996 (*Begg et al*.) and has been revised twice since then (*Moher et al. 2001, Schulz et al. 2010*). It is currently endorsed by several prominent editorial organizations including the International Committee of Medical Journal Editors (ICMJE) and the World Association of Medical Editors (WAME). *(http://www.consort-statement.org/about-consort/impact-of-consort*). There is evidence that it is associated with an upgrade in the RCT reporting quality *(Hopewell et al, 2010, Egger et al, 2001, Plint et al, 2006*).

A number of publications have studied the quality of reports of RCTs in dentistry (*Cioffi et al 2011, Saltaji et al, 2017, Pandis et al 2010*) and in its subspecialties: in Periodontology *(Leow et al, 2016*), in Pediatric dentistry (*Al-Namankany et al, 2009, Rajasekharan et al, 2014*), in Implantology (*Cairo et al, 2012, Tonetti et al, 2012*), in Orthodontics (*Koletsi et al, 2016*, *Pandis et al, 2014, Kloukos et al, 2015, Lempesi 2014*), in Prosthodontics *(Patel et al, 2014, Kloukos et al, 2015)* and in Endodontics (*Lucena et al, 2017*). As far as we know, there has been no review of the quality of reporting of RCTs for PDT or LR therapy in Periodontitis. A relative study concerned the reporting quality assessment of RCT abstracts published in leading laser medicine journals using the CONSORT for abstracts guidelines (*Lu Jin et al, 2016*).

In the present study, the quality of reporting of RCTs for PDT or LR therapy in patients with periodontitis has been assessed using the items of the expanded CONSORT 2010 checklist. The period covered is from 2013 to first semester of 2018.

MATERIALS AND METHODS

Eligibility criteria

Inclusion criteria were clinical trials that had allocated patients to at least two treatment groups (test and control) randomly. Participants with different types of periodontitis were included: chronic, aggressive, moderate, severe generalized, with class II furcation or residual pockets in maintenance. PDT or LR therapy was implemented either primarily or adjunctively to the test group for the nonsurgical treatment of periodontitis while Scaling and Root Planing (SRP) was applied to the control group. Only studies reporting the effect on the reduction of probing depth (PD) or the Clinical Attachment Level (CAL) as one of the outcomes, were included. There was no minimum length of follow-up.

Exclusion criteria were: systematic reviews, meta-analyses, protocol studies, case series, in vitro studies and studies involving open flap therapy or focusing exclusively on the microbiological and/or biochemical results of PDT or LR therapy. Split-mouth design RCTs were not included because they required a different assessment tool, the *CONSORT 2010 extension checklist for reporting within person randomized trials* (*Pandis et al, 2017*)

Data sources and searching strategy

PubMed was searched for studies written in English and published between 1.1.2013 and 30.6.2018, by implementing 'Advanced Search'. The last search was run on 2 August 2018. The following search terms were used:

(((random OR at random OR randomly OR randomized OR randomization OR RCT OR randomized clinical trial OR randomized controlled trial OR controlled clinical trial OR random allocation OR double blind method OR single blind method)) AND (laser diode OR laser therapy OR photodynamic therapy OR laser)) AND (periodontitis OR periodontal therapy OR periodontal disease OR periodontal treatment).

The limiter 'humans' was used.

Data extraction

Information was extracted from each article regarding: Journal published, its content (dental or general scientific) and CONSORT endorsement or not, year of publication, region of authorship, number of centers involved, number of groups to which interventions were allocated, type of therapy applied to the test group (PDT or LR), participants' characteristics, sample size and statistical methods used.

No authors were contacted in cases of inaccuracies or unclear results.

Assessment procedure

The CONSORT 2010 checklist *(http://www.consort-statement.org)* was expanded and used for the assessment of the RCTs. Compound questions in the original checklist were split into simple ones for the purpose of accuracy and they were scored separately (Table 1). Certain criteria in the original CONSORT 2010 checklist did not apply for any of the selected studies. Therefore they were omitted. Those criteria were: 3b [Important changes to methods after trial commencement (such as eligibility criteria), with reasons], 6b (Any changes to trial outcomes after the trial commenced, with reasons), 7b (When applicable, explanation of any interim analyses and stopping guidelines) and 14b (Why the trial ended or was stopped).

In accordance with the CONSORT authors' recommendations (*Moher et al, 2010*), additional criteria were included: In '*Abstract*', the items from the '*CONSORT for Abstracts*' (*Hopewell et al, 2008*) checklist –apart from 'Trial status'-, in '*Materials and Methods*' (particularly in the 'Statistical methods'), item Nr 47: 'Details of the statistical analysis (such as ITT analysis)', in '*Results*', item Nr 49: 'Participant flow diagram' and in '*Discussion'*, items Nr 65-67: 'Comparison with relevant findings from other published studies', 'Consideration of possible mechanisms and explanation' and 'Clinical and research implications' (as suggested also by '*Annals of Internal Medicine*').

All items were scored as '1' when reported or '0' when not reported. Non-applicable items did not receive any score. When an item was reported in a section of the trial different from which it was expected (i.e.: in 'Results' instead of 'Methods'), then it was considered as not reported. Items from '*Other information*' section (Nr 70: 'Registration, Nr 71: 'Protocol' and Nr 72: 'Funding') as well as Item 55: 'Dates defining the periods of recruitment and follow-up', were considered as positive if they were reported, independently from the section in which they were mentioned.

When the primary outcome was unclear, it was concluded by the sample size calculation (*Moher et al, 2001*). In case of improper statistical methods or unclear results, items 2, 17, 19, 59, 60 and 64-69 received a negative response. If certain items from the '*Results*' section were not directly reported, they were extracted from the tables and figures wherever possible.

The '*CONSORT explanation and elaboration document*' (*Moher et al, 2010*) was used as guideline. The evaluation regarded the reporting of the selected criteria, not the verification of their implementation.

The scores for the 72 items were combined and a percentage score was calculated for each trial (CONSORT Compliance score-CCS).

Statistical analysis

Trials were separated into 2 categories *(http://www.consort-statement.org/about-consort/endorsers1)* according to whether the journal they were published in is endorsing the CONSORT 2010 statement (8/18, 44.4%) or not (10/18, 54.6%). Reported items were also divided into 6 sections: *Title-Abstract, Introduction, Materials and Methods, Results, Discussion* and *Other information.* Descriptive statistics and percentage compliance by modified CONSORT checklist item were reported for all published trials and for each of the two groups, C and NC, separately. The percentage of articles that reported at least 65% of the checklist items was calculated and comparisons between 2 groups were made applying Fisher's exact test. The numbers of items per each section that were reported by 75% and more of the RCTs of the C group were compared with the corresponding of the NC groups using Fisher's Exact Test and Pearson's Chi Square.

Table 1: Self-designed checklist for assessing the quality of reporting of RCTs based on the CONSORT 2010 checklist, frequency distribution of the included items in total and by CONSORT / no CONSORT endorsement journal. Note that some items are not applicable to all RCTs.

Nr	Section	Modified CONSORT item	Nr of RCTs to which the item is applicable (%)	Compliance TOTAL N (%)	Nr of RCTs to which the item is applicable (%)	Compliance CONSORT N (%)	Nr of RCTs to which the item is applicable (%)	Compliance No CONSORT N (%)
1	Title	Identification as a randomized trial in the title	18 (100)	11 (61.1)	7 (100)	7 (100)	11 (100)	4 (36.4)
2	Abstract	Structured summary of trial design, methods, results and conclusions	18 (100)	12 (66.7)	7 (100)	6 (85.7)	11 (100)	6 (54.5)
3		Contact details of the corresponding author	18 (100)	14 (77.8)	7 (100)	3 (42.9)	11 (100)	11 (100)
4		Description or trial design	18 (100)	14 (77.8)	7 (100)	7 (100)	11 (100)	7 (63.6)
5		Eligibility criteria for participants	18 (100)	0 (0)	7 (100)	0 (0)	11 (100)	0 (0)
6		Settings where the data were collected	18 (100)	1 (5.6)	7 (100)	0 (0)	11 (100)	1 (9.1)
7		Interventions intended for each group	18 (100)	18 (100)	7 (100)	7 (100)	11 (100)	11 (100)
8		Specific objectives or hypotheses for this report	18 (100)	17 (94.4)	7 (100)	7 (100)	11 (100)	10 (90.9)
9		Clearly defined primary outcome for this report	18 (100)	4 (22.2)	7 (100)	3 (42.9)	11 (100)	1 (9.1)
10		How participants were allocated to interventions	18 (100)	2 (11.1)	7 (100)	1 (14.3)	11 (100)	1 (9.1)
11		Whether participants were blinded to group assignment	18 (100)	2 (11.1)	7 (100)	1 (14.3)	11 (100)	1 (9.1)
12		Care givers were blinded to group assignment	18 (100)	1 (5.6)	7 (100)	1 (14.3)	11 (100)	0 (0)
13		Those assessing the outcomes were blinded to group assignment	18 (100)	2 (11.1)	7 (100)	2 (28.6)	11 (100)	0 (0)
14		Number of participants randomized to each group	18 (100)	13 (72.2)	7 (100)	5 (71.4)	11 (100)	10 (90.9)
15		Number of participants analyzed in each group	18 (100)	4 (22.2)	7 (100)	1 (14.3)	11 (100)	3 (27.3)
16		For the primary outcome a result for each group	18 (100)	2 (11.1)	7 (100)	1 (14.3)	11 (100)	1 (9.1)
17		The estimated effect size and its precision	18 (100)	3 (16.7)	7 (100)	2 (28.6)	11 (100)	1 (9.1)
18		Important adverse events or side effects	18 (100)	0 (0)	7 (100)	0 (0)	11 (100)	0 (0)
19		General interpretation of the results	18 (100)	12 (66.7)	7 (100)	5 (71.4)	11 (100)	7 (63.6)
20		Registration number and name of trial registry	18 (100)	2 (11.1)	7 (100)	2 (28.6)	11 (100)	0 (0)
21		Source of funding	18 (100)	5 (27.8)	7 (100)	5 (71.4)	11 (100)	0 (0)
22	Introduction	Scientific background	18 (100)	16 (88.9)	7 (100)	7 (100)	11 (100)	9 (81.8)
23		Explanation of rationale	18 (100)	16 (88.9)	7 (100)	7 (100)	11 (100)	9 (81.8)
24		Specific objectives or hypotheses	18 (100)	16 (88.9)	7 (100)	7 (100)	11 (100)	9 (81.8)
25	Materials and methods	Description of trial design (such as parallel, factorial)	18 (100)	15 (83.3)	7 (100)	6 (85.7)	11 (100)	9 (81.8)
26		Allocation ratio	18 (100)	13 (72)	7 (100)	4 (57.1)	11 (100)	9 (81.8)
27		Eligibility criteria for participants	18 (100)	18 (100)	7 (100)	7 (100)	11 (100)	11 (100)
28		Settings where the data were collected	18 (100)	16 (88.9)	7 (100)	6 (85.7)	11 (100)	10 (90.9)
29		Locations where the data were collected	18 (100)	15 (83.3)	7 (100)	6 (85.7)	11 (100)	9 (81.8)
30		The interventions for each group with sufficient details to allow replication	18 (100)	17 (94.4)	7 (100)	7 (100)	11 (100)	10 (90.9)
31		How and when they were actually administered	18 (100)	16 (88.9)	7 (100)	7 (100)	11 (100)	9 (81.8)
32		Completely defined pre-specified primary and secondary outcome measures	18 (100)	14 (77.8)	7 (100)	6 (85.7)	11 (100)	8 (72.7)
33		How primary and secondary outcome measures were assessed	18 (100)	17 (94.4)	7 (100)	7 (100)	11 (100)	10 (90.9)
34		When primary and secondary outcome measures were assessed	18 (100)	18 (100)	7 (100)	7 (100)	11 (100)	11 (100)
35		How sample size was determined	18 (100)	14 (77.8)	7 (100)	7 (100)	11 (100)	11 (100)
36		Method used to generate the random allocation sequence	18 (100)	11 (61.1)	7 (100)	6 (85.7)	11 (100)	5 (45.5)
37		Type of randomization; Details of any restriction (such as blocking and block size)	18 (100)	9 (50)	7 (100)	4 (57.1)	11 (100)	5 (45.5)
38		Mechanism used to implement the random allocation sequence (such as sequentially numbered containers)	18 (100)	6 (33.3)	7 (100)	5 (71.4)	11 (100)	1 (9.1)

39		Description of any steps taken to conceal the sequence until interventions were assigned	18 (100)	8 (44.4)	7 (100)	5 (71.4)	11 (100)	3 (27.3)
40		Who generated the random allocation sequence	18 (100)	5 (27.8)	7 (100)	3 (42.9)	11 (100)	2 (18.2)
41		Who enrolled participants	18 (100)	3 (16.7)	7 (100)	3 (42.9)	11 (100)	0 (0)
42		Who assigned participants to interventions	18 (100)	6 (33.3)	7 (100)	3 (42.9)	11 (100)	3 (27.3)
43		If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes)	18 (100)	13 (72.2)	7 (100)	7 (100)	11 (100)	6 (54.5)
44		How was blinding done	18 (100)	10 (55.6)	7 (100)	5 (71.4)	11 (100)	5 (45.5)
45		If relevant, description of the similarity of interventions	18 (100)	4 (22.2)	7 (100)	2 (28.6)	11 (100)	2 (18.2)
46		Statistical methods used to compare groups for primary and secondary outcomes	18 (100)	17 (94.4)	7 (100)	7 (100)	11 (100)	10 (90.9)
47		ITT analysis	18 (100)	3 (16.7)	7 (100)	3 (42.9)	11 (100)	0 (0)
48		Methods for additional analyses, such as subgroup analyses and adjusted analyses	18 (100)	3 (16.7)	7 (100)	1 (14.3)	11 (100)	2 (18.2)
49	Results	Flow diagram	18 (100)	10 (55.6)	7 (100)	7 (100)	11 (100)	3 (27.3)
50		For each group, the numbers of participants who were randomly assigned	18 (100)	16 (88.9)	7 (100)	7 (100)	11 (100)	9 (81.8)
51		For each group, the numbers of participants who received intended treatment	18 (100)	15 (83.3)	7 (100)	7 (100)	11 (100)	8 (72.7)
52		For each group, the numbers of participants who were analyzed for the primary outcome	18 (100)	15 (83.3)	7 (100)	7 (100)	11 (100)	8 (72.7)
53		For each group, losses and exclusions after randomization	18 (100)	16 (88.9)	7 (100)	7 (100)	11 (100)	9 (81.8)
54		Reasons for losses and exclusions after randomization	10 (100)	9 (90)	5 (100)	5 (100)	5 (100)	4 (80)
55		Dates defining the periods of recruitment and follow-up	18 (100)	12 (66.7)	7 (100)	6 (85.7)	11 (100)	6 (54.5)
56		A table showing baseline demographic and clinical characteristics for each group	18 (100)	12 (66.7)	7 (100)	4 (57.1)	11 (100)	8 (72.7)
57		For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups	18 (100)	14 (77.8)	7 (100)	6 (85.7)	11 (100)	8 (72.7)
58		For each primary and secondary outcome, results for each group	18 (100)	17 (94.4)	7 (100)	7 (100)	11 (100)	10 (90.9)
59		For each primary and secondary outcome the estimated effect size	18 (100)	2 (11.1)	7 (100)	1 (14.3)	11 (100)	1 (9.1)
60		For each primary and secondary outcome, its precision (such as 95% confidence interval)	18 (100)	0 (0)	7 (100)	0 (0)	11 (100)	0 (0)
61		For binary outcomes, presentation of both absolute and relative effect sizes is recommended	12 (100)	0 (0)	5 (100)	0 (0)	7 (100)	0 (0)
62		Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory	18 (100)	8 (44.4)	7 (100)	2 (28.6)	11 (100)	6 (54.5)
63		All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	18 (100)	11 (61.1)	7 (100)	5 (71.4)	11 (100)	6 (54.5)
64	Discussion	Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses	18 (100)	11 (61.1)	7 (100)	6 (85.7)	11 (100)	5 (45.5)
65		Comparison with relevant findings from other published studies	18 (100)	12 (66.7)	7 (100)	6 (85.7)	11 (100)	6 (54.5)
66		Consideration of possible mechanisms and explanation	18 (100)	9 (50)	7 (100)	4 (57.1)	11 (100)	5 (45.5)
67		Clinical and research implications	18 (100)	8 (44.4)	7 (100)	4 (57.1)	11 (100)	4 (36.4)
68		Generalizability (external validity, applicability) of the trial findings	18 (100)	5 (27.8)	7 (100)	4 (57.1)	11 (100)	1 (9.1)

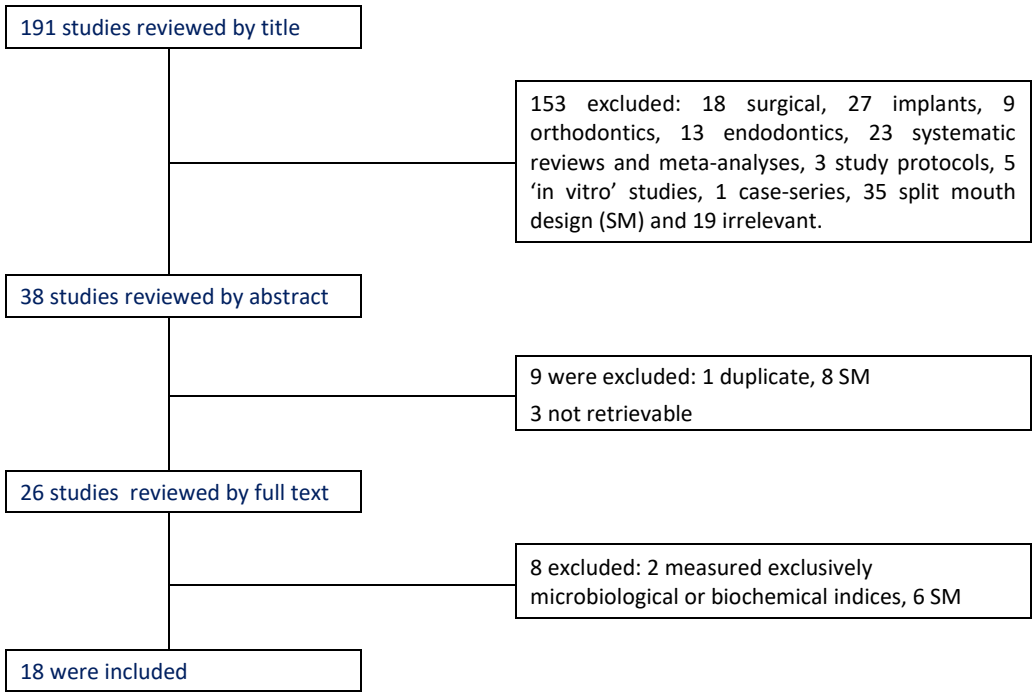
69		Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	18 (100)	11 (61.1)	7 (100)	7 (100)	11 (100)	4 (36.4)
70	Other information	Registration number and name of trial registry	18 (100)	6 (33.3)	7 (100)	5 (71.4)	11 (100)	1 (9.1)
71		Where the full trial protocol can be accessed, if available	18 (100)	11 (61.1)	7 (100)	4 (57.1)	11 (100)	7 (63.6)
72		Sources of funding and other support (such as supply of drugs), role of funders	18 (100)	17 (94.4)	7 (100)	7 (100)	11 (100)	10 (90.9)

No comparisons between articles published in journals with high and low impact factor (IF) were implemented. The particular journals addressed to different target groups and consequently, their IF depended also on each specialists' group population. Therefore it could not be considered as a sufficient index of the importance of the journal. Instead, journals were divided to 'Dental' (8/18, 44.4%), being addressed to dentists exclusively and 'General Scientific' (of general scientific interest) (10/18, 55.6%), aimed also to other professionals, apart from dentists. Mean CCSs for RCTs in 'Dental' and 'General Scientific' journals, as well as for studies being published each year or originating from different continents, were calculated and found to follow the normal distribution in all cases (Shapiro-Wilk normality test). Comparisons between groups were made using the Independent samples T-test ('Dental' and 'General' journals) and the One Way ANOVA (among studies published each year and also among articles originating from different continents).

The percentages of the C and NC studies that reported each item of the checklist were compared by the use of Pearson's Chi Square or Fisher's exact test.

All statistical analyses were made on the IBM SPSS v.21 package. Differences were considered statistically significant when $p<0.05$.

Figure 1. Flow chart of the search strategy.



RESULTS

191 studies were initially searched (See flow diagram Figure 1). After title assessment, 153 articles were excluded: 18 involved surgical treatment of periodontitis, 27 referred to implants, 22 to other dental specialties (9 to orthodontics and 13 to endodontics), 23 were systematic reviews and meta-analyses, 3 study protocols, 5 'in vitro' studies, 1 case-series, 35 had a split mouth (SM) design and 19 were irrelevant.

Following the abstract evaluation of the 38 articles that remained, 9 were excluded (1 was a duplicate and 8 were SM) and 3 could not be retrieved. From the 26 studies that were full-text reviewed, 8 were excluded (2 measured exclusively microbiological or biochemical indices and 6 were SM). Finally 18 RCTs, involving 732 patients, were evaluated. A list of the included studies can be found in the *Appendix*.

Table 2: Characteristics of the RCTs studied

		No (%) of trials (n=18)
Year of publication	2013	1 (5.6)
	2014	4 (22.2)
	2015	4 (22.2)
	2016	4 (22.2)
	2017	4 (22.2)
	2018	1 (5.6)
Journal	OF BIOLOGICAL REGULATORS & HOMEOSTATIC AGENTS	1 (5.6)
	LASERS IN MEDICAL SCIENCE	5 (27.8)
	PHOTODIAGNOSIS AND PHOTODYNAMIC THERAPY	2 (11.1)
	OF CLINICAL PERIODONTOLOGY	5 (27.8)
	OF PHOTOCHEMISTRY AND PHOTOBIOLOGY	1 (5.6)
	INTERNATIONAL OF DENTAL HYGIENE	1 (5.6)
	OF PERIODONTOLOGY	1 (5.6)
	OF CLINICAL ORAL INVESTIGATION	1 (5.6)
	QUINTESSENCE	1 (5.6)
CONSORT endorsement	Yes	7 (38.9)
	No	11 (61.1)
Continent	Europe	6 (33.3)
	South America	5 (27.8)
	Asia	7 (38.9)
Nr of authors	<4	2 (11.1)
	4, 5, 6	6 (33.3)
	>6	10 (55.6)
Nr of centers	Single	17 (94.4)
	Multi	1 (5.6)
Type of therapy	Photodynamic	12 (66.7)
	Laser	6 (33.3)
	Antibiotics	2 (11.1)
Patients	Smokers	1 (5.6)
	Pre-diabetics, Diabetics	3 (16.7)

Trial characteristics

The characteristics of the selected RCTs are shown in *Table 2*. The majority of the RCTs were published equally in the *Journal of Clinical Periodontology* (5/18, 27.8%) and in the *Journal of Lasers in Medical Science* followed by the *Journal of Photodiagnosis and Photodynamic therapy* (2/18, 11.1%). The total number of journals is 9. 3 of them - corresponding to the 39% (7/18) of the articles- are endorsing the CONSORT Statement whereas the other 6 are not [61% (11/18) of the studies]. In fact all the C journals are *'Dental'*, whereas none of the 'General Scientific' journals endorse the CONSORT statement. In total, the '*Dental*' journals published the 44.4% (8/18) of the articles and the 'General Scientific' the 55.6% (10/18) of them.

The RCTs are distributed equally among each year during the period 2014-2017: 4/18 (22.2%). In 2013 there is only 1 article (5.6%) and the same applies for the first semester of 2018. Most of the studies originates from Asia (7/18, 38.9%), followed by Europe (6/18, 33.3%) and by South America (5/18, 27.8%). Over the half of them (10/18, 55.6%) are written by more than 6 authors and the majority is single centered (17/18, 94.4%).

66.7% (12/18) implemented PDT therapy whereas 33.3% LR therapy. In 3 studies (16.7%) interventions were assigned to 3 groups and in 2 (11.1%) antibiotics were used adjunctively. Most of the studies involved no smokers (17/18, 94.6%) and patients with no systematic diseases (15/18). There are however a few (3/18, 16.7%) concerning diabetic (2, 11.1%) and pre-diabetic patients (1, 5.6%).

Descriptives

CONSORT Compliance Scores ranged from 27% to 77%. The average score was calculated 54.8% (46.9, 62.6%). 12/18 studies (66.7%) scored over 50%, 6/18 (33.3%) more than 65% and only 1/18 (5.6%) over 75%. Table 1 shows the number and the percentage of studies that reported each individual criterion.

The reported items that achieved 100% compliance score among RCTs were No 7: 'Interventions intended for each group' (in *Abstract*), Nr 27: 'Eligibility criteria for participants' and Nr 34: 'When primary and secondary outcome measures were assessed'. Furthermore, items Nr 8: 'Specific objectives or hypotheses for this report' (in *Abstract*), Nr 30: 'The interventions for each group with sufficient details to allow replication', Nr 33: 'How primary and secondary outcome measures were assessed', Nr 46: 'Statistical methods used to compare groups for primary and secondary outcomes', Nr 52: 'For each group, the numbers of participants who were analyzed for the primary outcome' and Nr 58: 'For each primary and secondary outcome, results for each group', Nr 72 'Sources of funding or other support' were reported in 94% (17/18) of the studies. Item Nr 54: 'Reasons for losses and exclusions after randomization' was included in 11 out of 12 RCTs in which it was applicable (91%). Following, criteria from *Discussion*: Nr 65: 'Comparison with relevant findings from other published studies', Nr 64: 'Trial limitations, addressing sources of potential bias, imprecision, and if relevant, multiplicity of analyses' and Nr 69: 'Interpretation consistent with results, balancing benefits and harms and considering other relevant evidence' were reported in 67% (12/18), 61%

(11/18) and 61% of the articles respectively. In fact, all the studies that implemented appropriate statistical analysis and formulated clear results, (100% -12/12) reported item 65 and most of them (92% -11/12) referred to the items 64 and 69.

On the contrary, the most underreported items were found in *Abstract*: Nr 5: 'Eligibility criteria for participants' (0%), Nr 18: 'Important adverse events or side effects' (0%), Nr 6: 'Settings where the data were collected' (6%, 1/18) and Nr 12: 'Care givers were blinded to group assignment' (6%). Regarding the reporting of the results for each primary or secondary outcome, criterion Nr 59: 'For each primary and secondary outcome the estimated effect size' was reported in 2 of the 18 articles (11%), whereas none of the RCTs was referred to item Nr 61: 'For binary outcomes, presentation of both absolute and relative effect sizes is recommended' (where applicable) or to Nr 60 'For each primary and secondary outcome, its precision (such as 95% confidence interval)'. In 12/18 (67%) of the articles, p-values between groups were provided instead.

Additionally, concerning *statistical analysis*, it was examined whether there was compliance with the CONSORT authors' recommendation: *'Treating multiple observations from one participant as independent data is a serious error; (Altman et al, 1997, Bolton, 1998) … Data analysis should be based on counting each participant once or should be done by using more complex statistical procedures' (Greenland 2000).* Taking into consideration that periodontitis examination involves multiple measurements in each patient, it was found that only 7 out of 18 RCTs (38.9%) reported that a patient level analysis for each of the clinical parameters had been implemented.

Moreover, 6 studies in total, with improper statistical analysis or unclear results were identified: 2 of them (11%) applied inappropriate statistical methods (Paired-Sample t-test for intergroup differences), 2 (11%) implemented no comparisons between groups, 1 (6%) provided no p-values or CIs -only boxplots- and in 1 (6%) it was not obvious whether p-values referred to intergroup or intragroup differences. Their mean CCS was 38.67% while the mean CCS of the rest articles increased to 62.83%. The former studies had the following characteristics: 66.7% (4/6) originated from Asia and 33.3% (2/6) from Europe, 83.3% (5/6) were published in NC journals and in 'General Scientific' journals.

Regarding Randomization, only 61.1% of the studies reported the 'Method used to generate the random allocation sequence' (Nr 36) and 50% the 'Type of randomization' (Nr 37), even though they were characterized as randomized. The reporting of the development and implementation of the allocation concealment represented by items Nr 38 (Mechanism), 39 (Concealment of the sequence until assignment of interventions), 40 (Allocation sequence generation), 41 (Participant enrollment) and 42 (participant assignment to interventions) was inadequate: The corresponding reporting percentages were: 33.3%, 44.4%, 27.8%, 16.7% and 33.3%. Finally, blinding was better reported than allocation concealment but still sub optimally: 27.8% of the studies did not refer who was blinded after intervention assignment (Nr 43) and 44.4% how was blinding done (Nr 44).

Comparisons

The average CCS for the C articles was calculated 65.7% (±7.2) and for the NC 47.8% (±9). 6/7 (85.7%) studies of the C group scored above 50% whereas 6/11 (54.5%) in the NC group achieved this score. Only 1 article (belonging to the C group) was evaluated with a CCS more than 75%. The RCTs that covered more than 65% of the modified CONSORT items were: C journals: 5/7 (71.4%), NC: 1/11 (9.1%), expressing a statistically significant difference in compliance with CONSORT between the different types of journals [RR=25, (1.8, 346.7), p-value=0.013, Fisher's exact test]. This suggests that RCTs published in C journals are 25 times more likely to achieve 65% CONSORT compliance score than RCTs published in NC journals.

Table 2. Numbers and percentages of CONSORT items (overall and by section) reported by 75% or more of all the articles or by C / NC journal.

Journal/Checklist items	TOTAL (18 RCTs) N (%)	CONSORT (7 RCTs) N (%)	NO CONSORT (11 RCTs) N (%)
Overall (72)	26(36.1)	34 (47.2)	23 (31.9)
Title/Abstract (21)	4(19)	5(23.8)	4(19)
Introduction (3)	3(100)	3(100)	3(100)
Materials and Methods (24)	11(45.8)	13(54.2)	11(45.8)
Results (15)	7 (46.7)	9(60)	4(26.7)
Discussion (6)	0(0)	3(50)	0(0)
Other Info (3)	1(33.3)	1(33.3)	1(33.3)

Details on the frequency distribution of each item of the checklist per C / NC journal is presented at Table 1. 34 items (47.2%) were reported by more of the 75% of the articles in C group whereas the corresponding number for NC is 23 (31.9%), indicating an increased tendency, though not statistically significant (P-Value=0.061, Pearson's Chi Square), in the former.

The number of items per section that are reported by 75% and more of all the RCTs and of the studies in C and NC groups separately are presented in Table 2. No significant differences (Fisher's Exact Test, Pearson's Chi Square) were found between C and NC group, regarding any section.

Mean compliance score for 'Dental' and 'General Scientific' journals was 65±6.37% and 46.6±9.58% respectively. The mean difference was 18.4% (95% CI 5.89, 30.91%), (Independent samples T-Test) and it was statistically significant (P-Value=0.007 < 0.05). No statistically significant differences in average CONSORT Compliance scores were found between the articles published each year (One-Way ANOVA, F=0,065, P-Value= 0.98 > 0.05) and also between different continents: Europe (48.67%), South America (66.4%) and Asia (51.71%), (One-Way ANOVA, F=2.21, P-Value = 0.145 > 0.05).

The items that were statistically significant more likely to be reported in C RCTs than in NC are the following (Table 3):

- Items Nr 1 from *Tittle* (Identification of the trial as 'randomized' in the title), Nr 22-24 from *Introduction* (RR=1.2, P-Value<0.001 for each of them) and from *Discussion,* the items Nr 64: Trial limitations, 65: Comparison with other findings, 67: Implications, 68: Generalizability and 69: Interpretation.
- Items from *Abstract,* particularly: Nr 2: structured summary, Nr 4: trial design, Nr 9: clear definition of the primary outcome, Nr17: estimated effect size and precision, Nr 12: blinding of the care givers and outcome assessors (Nr 13), Nr 20: registration number and Nr 21: source of funding.

- Criteria related to randomization -apart from Nr 37 'Type of Randomization'-, allocation concealment or blinding –except for Nr 45 'Description of the similarity of interventions': RRs are the following: Nr 36: 7.21, P-Value<0.001, Nr 38: 24.75 P-Value<0.001, Nr 39: 6.62 P-Value<0.001, Nr 40: RR=3.44, P-Value<0.001, Nr 41 RR=76.6, P-Value<0.001, Nr 42 RR=2.04, P-Value=0.02, Nr 43 RR=1.82 P-Value<0.001, Nr 44 RR=2.87, P-Value<0.001).
- Item Nr 47: details on ITT analysis
- Items Nr 49: flow diagram , numbers of participants randomized (Nr 50), received treatment (Nr 51), analyzed (Nr 52), lost or excluded (Nr 53) – together with reasons, (Nr 54)- and all important harms (Nr 63)
- Trial number registration (Nr 70) and source of funding (Nr 72).

There were items statistically significant more likely to be reported in NC journals, such as:

- In *Abstract: '*Contact details of the corresponding author' (Nr 3) and 'Numbers of participants randomized (Nr 14) or analyzed (Nr 15) in each group'.
- A table with baseline characteristics of the participants (Nr 56) and
- Results of any other analysis –subgroup and adjusted (Nr 62).

Table 3: Percentages of C-NC journals reporting each item and p-values of their RRs by using Pearson's Chi-Square Test or Fisher's Exact Test

Nr	Modified CONSORT item	Compliance CONSORT N (%)	Compliance No CONSORT N (%)	P-Value
1	Identification as a randomized trial in the title	7 (100)	4 (36.4)	<0.001
2	Structured summary of trial design, methods, results and conclusions	6 (85.7)	6 (54.5)	<0.001
3	Contact details of the corresponding author	3 (42.9)	11 (100)	<0.001
4	Description or trial design	7 (100)	7 (63.6)	<0.001
5	Eligibility criteria for participants	0 (0)	0 (0)	-
6	Settings where the data were collected	0 (0)	1 (9.1)	0.002
7	Interventions intended for each group	7 (100)	11 (100)	-
8	Specific objectives or hypotheses for this report	7 (100)	10 (90.9)	0.002
9	Clearly defined primary outcome for this report	3 (42.9)	1 (9.1)	<0.001
10	How participants were allocated to interventions	1 (14.3)	1 (9.1)	0.27
11	Whether participants were blinded to group assignment	1 (14.3)	1 (9.1)	0.27
12	Care givers were blinded to group assignment	1 (14.3)	0 (0)	<0.001
13	Those assessing the outcomes were blinded to group assignment	2 (28.6)	0 (0)	<0.001
14	Number of participants randomized to each group	5 (71.4)	10 (90.9)	<0.001
15	Number of participants analyzed in each group	1 (14.3)	3 (27.3)	0.02
16	For the primary outcome a result for each group	1 (14.3)	1 (9.1)	0.27
17	The estimated effect size and its precision	2 (28.6)	1 (9.1)	0.01
18	Important adverse events or side effects	0 (0)	0 (0)	-
19	General interpretation of the results	5 (71.4)	7 (63.6)	0.29
20	Registration number and name of trial registry	2 (28.6)	0 (0)	<0.001
21	Source of funding	5 (71.4)	0 (0)	<0.001
22	Scientific background	7 (100)	9 (81.8)	<0.001
23	Explanation of rationale	7 (100)	9 (81.8)	<0.001
24	Specific objectives or hypotheses	7 (100)	9 (81.8)	<0.001
25	Description of trial design (such as parallel, factorial)	6 (85.7)	9 (81.8)	0.44
26	Allocation ratio	4 (57.1)	9 (81.8)	<0.001
27	Eligibility criteria for participants	7 (100)	11 (100)	-
28	Settings where the data were collected	6 (85.7)	10 (90.9)	0.27

29	Locations where the data were collected	6 (85.7)	9 (81.8)	0.44
30	The interventions for each group with sufficient details to allow replication	7 (100)	10 (90.9)	0.002
31	How and when they were actually administered	7 (100)	9 (81.8)	<0.001
32	Completely defined pre-specified primary and secondary outcome measures	6 (85.7)	8 (72.7)	0.02
33	How primary and secondary outcome measures were assessed	7 (100)	10 (90.9)	0.002
34	When primary and secondary outcome measures were assessed	7 (100)	11 (100)	-
35	How sample size was determined	7 (100)	11 (100)	-
36	Method used to generate the random allocation sequence	6 (85.7)	5 (45.5)	<0.001
37	Type of randomization; Details of any restriction (such as blocking and block size)	4 (57.1)	5 (45.5)	0.12
38	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers)	5 (71.4)	1 (9.1)	<0.001
39	Description of any steps taken to conceal the sequence until interventions were assigned	5 (71.4)	3 (27.3)	<0.001
40	Who generated the random allocation sequence	3 (42.9)	2 (18.2)	<0.001
41	Who enrolled participants	3 (42.9)	0 (0)	<0.001
42	Who assigned participants to interventions	3 (42.9)	3 (27.3)	0.018
43	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes)	7 (100)	6 (54.5)	<0.001
44	How was blinding done	5 (71.4)	5 (45.5)	<0.001
45	If relevant, description of the similarity of interventions	2 (28.6)	2 (18.2)	0.13
46	Statistical methods used to compare groups for primary and secondary outcomes	7 (100)	10 (90.9)	0.002
47	ITT analysis	3 (42.9)	0 (0)	<0.001
48	Methods for additional analyses, such as subgroup analyses and adjusted analyses	1 (14.3)	2 (18.2)	0.44
49	Flow diagram	7 (100)	3 (27.3)	<0.001
50	For each group, the numbers of participants who were randomly assigned	7 (100)	9 (81.8)	<0.001
51	For each group, the numbers of participants who received intended treatment	7 (100)	8 (72.7)	<0.001
52	For each group, the numbers of participants who were analyzed for the primary outcome	7 (100)	8 (72.7)	<0.001
53	For each group, losses and exclusions after randomization	7 (100)	9 (81.8)	<0.001
54	Reasons for losses and exclusions after randomization	5 (100)	4 (80)	<0.001
55	Dates defining the periods of recruitment and follow-up	6 (85.7)	6 (54.5)	<0.001
56	A table showing baseline demographic and clinical characteristics for each group	4 (57.1)	8 (72.7)	0.27
57	For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups	6 (85.7)	8 (72.7)	0.02
58	For each primary and secondary outcome, results for each group	7 (100)	10 (90.9)	0.002
59	For each primary and secondary outcome the estimated effect size	1 (14.3)	1 (9.1)	0.27
60	For each primary and secondary outcome, its precision (such as 95% confidence interval)	0 (0)	0 (0)	-
61	For binary outcomes, presentation of both absolute and relative effect sizes is recommended	0 (0)	0 (0)	-
62	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory	2 (28.6)	6 (54.5)	<0.001
63	All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	5 (71.4)	6 (54.5)	0.02
64	Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses	6 (85.7)	5 (45.5)	<0.001
65	Comparison with relevant findings from other published studies	6 (85.7)	6 (54.5)	<0.001
66	Consideration of possible mechanisms and explanation	4 (57.1)	5 (45.5)	0.12
67	Clinical and research implications	4 (57.1)	4 (36.4)	0.003
68	Generalizability (external validity, applicability) of the trial findings	4 (57.1)	1 (9.1)	<0.001

69	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	7 (100)	4 (36.4)	<0.001
70	Registration number and name of trial registry	5 (71.4)	1 (9.1)	<0.001
71	Where the full trial protocol can be accessed, if available	4 (57.1)	7 (63.6)	0.31
72	Sources of funding and other support (such as supply of drugs), role of funders	7 (100)	10 (90.9)	0.002

Conclusions

According to the present study the reporting quality of the RCTs for photodynamic or laser diode therapy in periodontitis during the period 1.1.2013-30.6.2018 is suboptimal. Only 26 of the 72 (36.1%) items from the modified CONSORT 2010 checklist have been reported in 75% and more of the RCTs. The poor Compliance Scores could be attributed to the high percentage of NO CONSORT articles (64%, 11/18) in the sample. Articles in CONSORT endorsing journals include more items from the modified CONSORT list than studies in NO CONSORT journals (47.2% and 31.9% of the total items reported by the 75% or more of the C and NC RCTs, respectively). The majority of relevant RCTs is found in General scientific journals (55.6% -10/18) and their reporting quality is significantly lower than those' published in 'Dental' journals (CCS: 46.6±9.58% compared to 65±6.37%, P-Value=0.007). Unfortunately no improvement in the reporting quality of the RCTs for PDT / LR in periodontitis has taken place during the last 5 years.

The highest percentage of items reported by 75% and more of the studies is in *Introduction* by far whereas the lowest is in *Discussion.* To the low *Discussion* Compliance score contributed the fact that items from *Discussion* received a negative response in case of implementation of improper statistical methods (which applied for the 33.3% of the studies). Special concern needs to be raised for the content of *Title-Abstract.* Although this section is essential for reaching a clinical decision or for further selecting of a RCT by readers with no full-text access, its reporting quality is dissatisfactory: Only 19% (4/21) of its items are reported by 75% or more of the articles. This result corresponds to the finding of *Lu Jin et al (2016)*, according to which only 3 out of 16 original Abstract CONSORT items (18.8%) were reported in more than 80% of the RCTs originating from four leading laser medicine journals during the period 2014-2015.

Randomization process is also inadequately presented, although most of its items are more likely to be reported in C articles than in NC. It is an accepted fact that proper randomization involving generation of an unpredictable allocation sequence and concealment of this sequence from the investigators enrolling participants (*Herman et al, 2009*), is fundamental for the reduction of selection bias at trial entry (*Altman, 1991*). On the other hand blinding prevents from bias arising from assessing subjective outcomes (*Wood et al, 2008*). Consequently, poor reporting of the above elements might indicate compromised quality of a RCT.

In 61.1% (11/18) of the studies, there is no evidence that statistical analysis has been implemented regarding the patient as the statistical unit, which is recommended as proper, in the case of periodontitis therapy.

The present study has its weak points. Due to the restricted amount of included trials there are limitations in statistical analysis. However, statistically significant differences between pre-specified groups have been found. Moreover, RCT evaluation was undertaken by a sole scientist venturing the objectiveness of the findings. This

constraint has been partially encountered by splitting complex items from the original CONSORT 2010 list into simple ones, creating the modified CONSORT item checklist. Optimally, inclusion of additional studies covering a longer period of time as well as article review by two authors would abrogate the above mentioned limitations.

Summarizing:

- The reporting quality of RCTs for PDT or LR therapy in periodontitis during the period 1.1.2013-30.6.2018 is suboptimal.
- The majority of the C articles achieve better CCS than NC.
- The same applies for RCTs in 'Dental' journals compared to RCTs published in 'General Scientific' journals.
- CONSORT compliance has not changed during the last 5 years.
- Journal endorsement of the CONSORT statement may enhance the completeness of reporting of RCTs and thus provide the clinicians a reliable tool for proper decision making and the investigators the capacity to advance clinical research on the particular era.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

APPENDIX

AUTHOR	JOURNAL	YEAR	SCORE(%)
Mastrangelo et al	*Journal of biological regulators and homeostatic agents*	2018	27
Andrande et al	*Lasers in Med Science*	2017	61
Segarra-Vidal et al	*Journal of Clinical Periodontology*	2017	69
Theodoro et al	*Journal of Photochemistry & Photobiology*	2017	68
Monzavi et al	*Photodiagnosis and Photodynamic Therapy*	2016	54
Alzoman et al	*International Journal of Dental Hygiene*	2016	47
Sanz-Sanchez et al	*Journal of Periodontology*	2015	72
Carvalho et al	*Journal of Clinical Periodontology*	2015	77
Petalin et al	*Lasers in Med Science*	2015	37
Qadri et al	*Lasers in Med Science*	2015	27
Arweiler et al	*Journal of Clinical Oral Investigation*	2014	60
Betsy et al	*Journal of Clinical Periodontology*	2014	68
Saglam et al	*Lasers in Med Science*	2014	57
Luchesi et al	*Journal of Clinical Periodontology*	2013	58
Al Askar et al	*Journal of Photodiagnosis and Photodynamic therapy*	2017	29
Kocak et al	*Lasers in Med Science*	2016	59
Ramos et al	*Journal of Clinical Periodontology*	2016	68
Balasubramaniam et al	*Quintessence*	2014	48

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