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Reporting of embryo transfer methods in IVF research: a cross-sectional study




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Abstract The reporting of embryo transfer methods in IVF research was assessed through a cross-sectional analysis of randomized controlled trials (RCTs) published between 2010 and 2011. A systematic search identified 325 abstracts; 122 RCTs were included in the study. Embryo transfer methods were described in 42 out of 122 articles (34%). Catheters (32/42 [76%]) or ultrasound guidance (31/42 [74%]) were most frequently mentioned. Performer 'blinding' (12%) or technique standardization (7%) were seldom reported. The description of embryo transfer methods was significantly more common in trials published by journals with lower impact factor (less than 3, 39.6%; 3 or greater, 21.5%; $P = 0.037$). Embryo transfer methods were reported more often in trials with pregnancy as the main end-point (33% versus 16%) or with positive outcomes (37.8% versus 25.0%), albeit not significantly. Multivariate logistic regression confirmed that RCTs published in higher impact factor journals are less likely to describe embryo transfer methods (OR 0.371; 95% CI 0.143 to 0.964). Registered trials, trials conducted in an academic setting, multi-centric studies or full-length articles were not positively associated with embryo transfer methods reporting rate. Recent reports of randomized IVF trials rarely describe embryo transfer methods. The under-reporting of research methods might compromise reproducibility and suitability for meta-analysis. 

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KEYWORDS: embryo transfer, in-vitro fertilization, randomized controlled trials, reproducibility of research, research methods, risk of bias

Introduction

If we accept that reproducibility is one of the principles of the scientific method (Siegel, 2011), then reporting the methods of research is equally important as disseminating its results. A good description of a study's methodology allows others to replicate the experiment accurately and verify previous findings. Current research, however, shows that scientific reporting can often be inadequate, even in the case of high-quality studies such as randomized controlled trials (Péron et al., 2012; Turner et al., 2012; Wang et al., 2011).

In the context of IVF, embryo transfer is a crucial and integral part of the treatments, and evidence shows that different methods or performers of embryo transfer can influence the resulting pregnancy rates (Levi Setti et al., 2003; Mains and Van Voorhis, 2010). Nevertheless, no consensus exists on the best method of embryo transfer, and different techniques might be preferred by different clinics, and also by different physicians practising in the same clinic. We would, therefore, expect that relevant scientific literature would provide information on the embryo transfer procedure within the description of scientific methods, so that the risk of bias is reduced and reproducibility is permitted.

The aim of this study was to verify the frequency and quality of reporting of embryo transfer methods in scientific publications describing outcomes of IVF and embryo transfer.

Materials and methods

A cross-sectional study of randomized controlled trials (RCT) on IVF outcomes published in scientific research during the entire 2010–2011 biennium was conducted. Only RCTs on IVF, reporting pregnancy or live birth, either as the main or secondary outcome, were included. The analysis was restricted to articles published in English. As published data were used, the present study was exempt from institutional review board approval.

Initially, 325 potentially eligible abstracts were identified through a prospective, systematic search conducted on PubMed (<http://www.ncbi.nlm.nih.gov/pubmed/>; mid-2012). The search was based on the following query: ('in-vitro fertilisation'[All Fields] OR 'fertilization in-vitro'[MeSH Terms] OR ('fertilization'[All Fields] AND 'vitro'[All Fields]) OR 'fertilization in-vitro'[All Fields] OR ('vitro'[All Fields] AND 'fertilization'[All Fields]) OR 'in-vitro fertilization'[All Fields] OR 'embryo transfer'[All Fields]) AND ('humans'[MeSH Terms] AND (Clinical Trial[ptyp] OR Randomized Controlled Trial[ptyp]) AND ('2010/01/01'[PDAT]: '2011/12/31'[PDAT])).

Once the titles and abstracts had been screened, 150 articles were selected for full-text download and further assessment of eligibility. Finally, 122 RCTs were identified and included in the study (Figure 1). Most of the excluded articles were not RCTs, did not report pregnancy as outcome, or were written in a language other than English. References and articles were managed using free online (MyNCBI; <http://www.ncbi.nlm.nih.gov/myncbi/>) and offline (Zotero; <http://www.zotero.org/>) tools (Hull et al., 2008). All articles were searched for data by hand and with the assistance of desktop-search software to guarantee accuracy (Magos and Gambadauro, 2005).

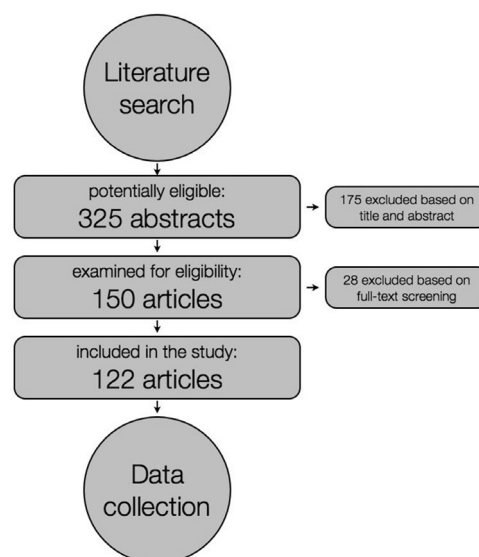


Figure 1 Article selection. The selection of articles was in accordance with criteria described in the Material and Methods section.

Data were collected on the reporting of the following aspects of embryo transfer procedures: methods, blinding, standardization, ease of embryo transfer and performer. It was recorded whether the study's main subject was related to embryo transfer technique or not. The following data on the kind of publication and study characteristics were collected and treated as categorical variables: article length (full/short), patient population (general/specific, e.g. whether the patient had polycystic ovary syndrome or were low responders), pregnancy as main outcome (yes/no), positive outcomes (yes/no), multi-centric study (yes/no), trial registration (yes/no) and academic setting (yes/no). The journal's impact factor (Journal Citation Reports®, Thomson Reuters, 2011) was also treated as a categorical variable, dividing the articles into two groups (impact factor less than 3, and impact factor 3 or over). All data were collected by means of a dedicated digital form and temporarily stored on an online database created through the free Google Drive platform (Gambadauro and Magos, 2008).

Descriptive statistics were used to calculate the frequencies of different embryo transfer methods reporting. Comparative analyses by bivariate and multivariate statistics were performed after excluding articles whose subject was the embryo transfer procedure itself. Fisher's exact or chi-squared tests were carried out as appropriate to measure the association between different variables and the description of embryo transfer methods. A multivariate analysis with logistic regression was used to control for confounding and identify the odds ratio (OR) and 95% confidence interval (CI) for factors independently related to embryo transfer methods reporting. The same calculations were also repeated with the blinding of the embryo transfer performer as dependent variable. $P < 0.05$ (two-tailed) was considered statistically significant. The Statistical Package for Social Sciences (SPSS, IBM Corp., USA) for Mac OSX was used for statistical calculations.

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