The Quality of Reporting of Randomized Control Trials in Radiology in the Last 10 Years

Yoan Kagoma, MD; Basma Al-Arnawoot, MBBS; Mohit Bhandari, MD, PhD; Mary Chiavaras, MD, PhD

McMaster University
Hamilton, ON Canada
DISCLOSURE

• Yoan Kagoma:
  – No conflicts to disclose

• Basma Al-Arnawoot:
  – Resident representative for CAR CPD Working Group for 2016/2017 ASM

• Mohit Bhandari:
  – Grants/honoraria from Stryker, Smith and Nephew, Johnson and Johnson

• Mary Chiavaras:
  – In kind research support from Arthrex Pharmaceuticals
  – Grant/honoraria from IICME
  – Current PI of IMPROVE trial
RATIONALE

• In the past 10 years, there has been a trend to assess the quantity and quality of RCTs in different specialities including plastic surgery, neurosurgery, and orthopedics\textsuperscript{1,2,3}.

• However, no similar assessment has ever been completed in radiology.

GOALS AND OBJECTIVES

The objectives of this study were to:

1. Identify the number of radiology-related RCTs published over the past 10 years

2. Assess the quality of the identified RCTs

3. Identify predictors of high quality studies
METHODS

1) Electronic Database Search

- Medline and Cochrane databases were systematically reviewed using the following keywords and their permutations:
  - Randomized control trial
  - Radiology

- Results were filtered to include:
  - Human trials
  - Publication dates between January 1, 2003 and November 16, 2013
  - English language
METHODS

2) Abstract Screening

• Abstract and title screening was completed in duplicate (Authors YKK and BA).
• If an abstract was incomplete, it was included for full-text review.
• Discrepancies were resolved by consensus with a third co-author consulted if necessary.
METHODS

3) Full Text Screening

• The first 18 articles underwent full-text screening in duplicate to ensure a unified approach.

• Thereafter, full text screening was completed independently using the following inclusion criteria:
  – Studies that affected the practice of radiology and included at least one of the following:
    • Were associated with a department of radiology
    • A radiologist was listed as an author
    • A radiologic modality was being investigated
METHODS

4) Data Abstraction

The following data were collected:

- Publication year
- Journal of publication
- Number of authors
- Name and specialty of first author
- Duration of study
- Departments involved
- Country
- Number of subjects
- Number of centers
METHODS

5) Quality Assessment/Data Analysis

• The Detsky quality index was used to score methodology\(^1\) and assesses:
  – Randomization, outcome measures, eligibility criteria, intervention description, statistical analysis

• Scores were standardized to a 100 point scale. A score >75% was designated as high-quality.

• Means, standard deviations, and abstract screening agreement were calculated.

Electronic database search identified:
  Cochrane: N=83
  Medline: N=983

Papers for title and abstract screening
  N=1066

N=992 Papers excluded for not meeting filter criteria

Papers for review of full text
  N=74

Articles included
  N=36

Articles excluded:
  • Did not affect practice of radiology N=10
  • Did not involve a radiologist N=2
  • Did not investigate a radiological modality N=1
  • Was not a complete article N=3
  • Was not an RCT N=15
  • Was not in English N=7
RESULTS

• Total of 36 studies were included in the final analysis of which 19 were published in a primary radiology journal.
• Study populations ranged from 12 to 31,057 participants and duration ranged from 17 days to 48 months.
• 69% of studies were conducted at a single institution.
• 20 studies were conducted in North America. The remainder were in Europe.
## RESULTS

<table>
<thead>
<tr>
<th>CHARACTERISTICS OF STUDIES</th>
<th>NUMBER OF STUDIES (N=36)</th>
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<tbody>
<tr>
<td><strong>First Author</strong></td>
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<tr>
<td>Radiologist</td>
<td>19</td>
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<tr>
<td>Non-Radiologist</td>
<td>17</td>
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<td><strong>Modality/Radiological Sub-Speciality</strong></td>
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<td>Ultrasound</td>
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<tr>
<td>Radiography</td>
<td>4</td>
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<tr>
<td>Multimodality/others</td>
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</table>
RESULTS

- The mean Detsky score for quality was 76% with a standard deviation of 15%.
- 58% (21/36) of the studies were considered high-quality (score > 75%).
- Of the 15 low-quality studies, 14 failed to blind assessors and 13 failed to calculate sample size.
RESULTS

Average Detsky Score (%) by Radiology Journal

- Radiology (n=1)
- Journal of Vascular and Interventional Radiology (n=2)
- Journal of the American College of Radiology (n=3)
- European Radiology (n=1)
- European Journal of Radiology (n=2)
- Cardiovascular and Interventional Radiology (n=1)
- Canadian Association of Radiologists Journal (n=1)
- British Journal of Radiology (n=2)
- American Journal of Roentgenology (n=1)
- Acta Radiologica (n=1)
- Academic Radiology (n=4)
RESULTS

Average Detsky Score (%) by Imaging Modality

- Ultrasonography (n=5)
- Radiography (n=4)
- Mammography (n=5)
- Interventional Radiology (n=10)
- Computed Tomography (n=6)
DISCUSSION

• A low number of radiology-related RCTs have been published compared to other specialties.
• Only 53% of published studies were in a radiology journal or had a radiologist as a first author.
• However, the quality of published RCTs (mean Detsky score of 76%) is comparable to orthopedics (68%), neurosurgery (81%), and plastic surgery (68%)\textsuperscript{1,2,3}.

\textsuperscript{3} Chuback JE et al. Evidence in the Aesthetic Surgical Literature over the Past Decade: How Far Have We Come?. Plastic and Reconstructive Surgery. 129(126e). January 2012.
# DISCUSSION

## Strengths
- Systematic database search methodology
- Large number of articles assessed.
- Validated quality assessment tool.
- Results directly comparable with analyses in other specialties.

## Limitations
- Small number of studies in the final analysis limiting quantitative analyses.
- English-language only
CONCLUSION

Improved awareness of the value of high-level evidence is of great importance to ensure that radiologists continue to provide quality care.

Contact: yoan.kagoma@medportal.ca