Women's Representation among Lead Investigators of Clinical Trials in Oncology

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PURPOSE / OBJECTIVES

- With increasing representation of women in medicine, recent efforts have attempted to determine whether women are well-represented among leaders of academic medicine and high-impact studies.[1-3]
- Therefore, we here report representation of female lead authors for oncologic phase 3 randomized controlled trials (RCTs).
- RCTs, which generally represent the gold standard of evidence in clinical medicine, advance both the standard of care for patients as well as the career trajectories of lead investigators.
- Trial leadership is an important factor for promotion and tenure, prominence in the field, and access to subsequent funding opportunities.
- We sought to quantify the proportion of RCTs led by women over time, and determine factors associated with female trial leadership among oncologic RCTs.
- Specific focus was placed on the role of industry sponsorship & cooperative group support for trials, as well as trends in rates of female trial leadership over time.

MATERIALS & METHODS

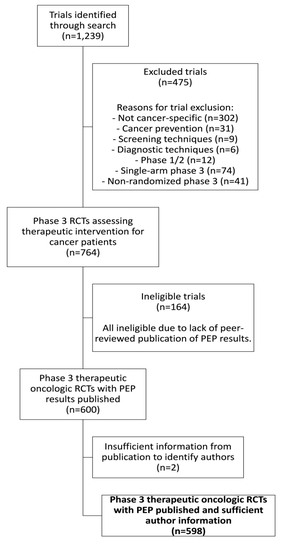
- ClinicalTrials.gov queried on Nov. 19, 2017 to identify oncologic RCTs.
- The following search parameters were used: Terms: "cancer"; Study Type: "All Studies"; Status: excluded "Not yet recruiting"; Phase: Phase 3; and Study Results: "With Results."
- This yielded 1,239 trials, which were then screened for cancer-specific phase III RCTs addressing a therapeutic intervention (Figure 1).
- Only trials with primary endpoint (PEP) results published in the peer-reviewed literature were included. Earliest publication of trial PEP were counted as the 'primary publication.'
- Final cohort of 598 trials included (Figure 1); associated primary PEP publications spanned 2003-2018.
- Two authors independently screened trials and collected data.
- Statistical analyses included: linear regression modeling & Pearson's *chi*-squared tests (SPSS, Version 22.0).[4]

RESULTS

Table 1. Trial Factors Associated with Female Corresponding Authorship (FCA)

Trial/Author Characteristic Associated with FCA		Trials With FCA, No. (%)	p-value
All included trials:		107/598 (17.9%)	
Industry funding of trial:	Yes	67/465 (14.4%)	p<0.001
	No	40/133 (30.1%)	
Cooperative group trial:	Yes	48/185 (25.9%)	p=0.001
	No	59/413 (14.3%)	
Trial Success (PEP met):	Yes	45/294 (15.3%)	p=0.11
	No	56/274 (20.4%)	
Disease Site	Breast	36/105 (34.3%)	p<0.001
	Gastrointestinal	6/76 (7.9%)	
	Genitourinary	5/69 (7.2%)	
	Head and neck	9/23 (39.1%)	
	Hematologic	11/118 (9.3%)	
	Thoracic	11/87 (12.6%)	
Modality:	Systemic Therapy	65/462 (14.1%)	p<0.001
	Radiotherapy	5/16 (31.3%)	
	Surgery	0/7 (0.0%)	
	Supportive Care	37/113 (32.7%)	
Country/World Region:	USA	74/329 (22.5%)	p=0.001
	Canada	4/20 (20.0%)	
	Europe	23/191 (12.0%)	
	Asia	1/44 (2.3%)	
Domestic Region (US-only):	West	15/58 (25.9%)	p=0.03
	Southwest	4/46 (8.7%)	
	Midwest	19/69 (27.5%)	
	Northeast	21/1121 (18.8%)	
	Southeast	15/44 (34.1%)	

Figure 1. Flowchart of clinical trial screening, eligibility, and inclusion.



Abbreviations: RCT, randomized controlled trial; PEP, primary endpoint.

- Table 1 highlights trial and author factors associated with female corresponding authorship (FCA), including industry sponsorship.
- FCA refers to the corresponding author; corresponding author was first author 88.3% of the time, last author 10.4% of the time, and another author 1.3% of the time.
- Differential FCA rates were noted based on industry sponsorship, cooperative group support, disease site, treatment modality being tested as part of the randomization of the RCT, and geographic location of the corresponding author.
- Examining all trials (N=598), FCA was analyzed by year of primary PEP publication. Linear regression modeling revealed estimated annual change of +1.2% in FCA rates (95% CI +0.1% to +2.3%, p=0.036, r=0.53).

DISCUSSION

- Overall FCA rate of 17.9% among phase 3 oncologic RCTs.
- Proportion of FCA increasing over time, at estimated rate of +1.2% annually; this echoes approximate 1.0% increase in rate of female academic hematologist-oncologists annually.[2]
- The absolute percentage of FCA for these trials does not reflect percentage of female academic heme-oncs during this time, which ranged 35-40% during 2010-2015.[2] Limitations of comparison without contemporary data from start of trial design / enrollment.
- FCA rate lower among industry-sponsored trials, possibly reflecting gender biases seen elsewhere in interface w/ medicine.[5-7]
- Future efforts will work to better understand and address reasons for differential gender imbalances across these factors.[8-11]
- Limitation: mandate of CT.gov has shifted since initiation in 2000; older trials, trials that do not utilize systemic therapy, and trials without enrollment in the USA may be underrepresented.[12,13]
- Limitation: temporally-unrestricted window for analysis. Major expansion of CT.gov mandate in 2007, and only 21 trials (3.5%) in this series had primary publication prior to 2007.[12,13] Therefore, the rate change of FCA over time likely remains valid and unaffected by era-related selection bias.
- Conclusions: FCA rates for oncologic RCTs are low overall, but these rates are slowly improving over time. Gender disparities in trial leadership persist, with particularly striking disparities noted among industry-funded trials.

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