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Hot Topic

Profiling clinical cancer research across the Atlantic: A review of research and its characteristics presented at ASCO and ESMO Congresses during the last decade

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ABSTRACT

Introduction: The comparison of clinical cancer research characteristics across the Atlantic and their evolution over time have not been studied to date.
Methods: We collected oral presentations on breast, lung and colorectal cancer at ASCO ($n = 506$) and ESMO ($n = 239$) Congresses in years 2000–2010.
Results: EU-originated research constituted 52% of all ASCO presentations while US-research 26.7% of ESMO Congress presentations. Industry sponsorship was reported in 24.8% of ASCO vs. 31.8% of ESMO Congress trials. ASCO-presented trials were larger with longer follow-up periods but were blinded less often. ESMO-presented trials used Event-Free Survival (EFS, 38.1%) and Surrogate (18.4%) primary endpoints and reported positive primary endpoints (65%) more often than ASCO-presented trials. Interim analysis resulted in discontinuation of a trial more often at ASCO Congress (8.3% vs. 3.2%). ASCO Congress-presented research was more often published (69.2% vs. 59.8% at ESMO) at higher impact factor journals. Strong trends over the decade were seen for more frequent industry sponsorship, blinded design, larger sample size, early interim discontinuation, use of EFS endpoints and biomarker evaluation.
Conclusions: Cancer clinical research is a complex scientific activity with common global but also distinct characteristics at the two sides of the Atlantic.

Introduction

Cancer ranks as the third cause of death in developed societies following coronary and cerebrovascular disease.[1] Contemporary oncological clinical research is shaped by a complex network of interacting factors such as unmet medical needs, health and socioeconomic characteristics of the population, and regulatory legislation. The prosperity of the community, societal perceptions on health, social security, allocation of expenses and resources contribute to the configuration of the research landscape. Oncological research is not only a composite, but also a dynamic process. It changes over time as a result of new legislature, evolution of clinical research organisations and patient advocacy groups, advances in molecular biology of cancer and breakthroughs in the rational design of drugs. Other factors modulating cancer research are the pressure of increasing cost of drug development and pricing on health systems and the changing epidemiology of cancer in human populations.[2,3]

The American Society of Clinical Oncology (ASCO) and the European Society of Medical Oncology (ESMO) Congresses are the two major oncology conferences where top cancer research is presented annually.[4,5] Accordingly, a snapshot of research characteristics can be captured by screening presentations at these Congresses. Moreover, shifts in various cancer research parameters should be identifiable. In this study, we screened oral presentations in ASCO and ESMO Congresses during the first decade of the 21st century on the most common solid tumours (breast, lung and colorectal cancer) in order to analyze demographics and basic characteristics of research, methodological and reporting features as well as metrics of research quality and impact on clinical practice. Our aim was not to prove or disprove scientific superiority of either of the two Congresses, but instead to: (a) examine the origin of scientific input in each Congress, (b) analyse differences in cancer research characteristics in those, and (c) track changes in cancer research characteristics over time and discuss causes and consequences.

Methods

We collected all oral presentations on breast, lung and colorectal cancer taken place at the ASCO and ESMO Congresses from 2000

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until 2010. In 2001, no ESMO conference took place, so the 11th European Cancer Conference (ECCO) was used as the yearly Congress. Moreover, in 2008 and 2009, the ESMO Conference Lugano (ECLU) and a joint ESMO/ECCO conference were held, respectively. In years 2000, 2002, 2003, 2004, 2005, 2006, 2007, and 2010 formal ESMO meetings took place. In order to collect data on demographics and basic characteristics, on methodological and reporting features and on metrics of research quality and impact, we used the electronic archives of the Congresses (available online at the society websites) as well as print material from the Abstract books of these Congresses. The origin of research presented was grouped as US (United States), US + World, US + EU (European Union), EU, EU + World, Not US nor EU. Industry sponsorship was considered present when a definite acknowledgement could be found that industry was involved in development of trial protocol, authorship, running of the trial, data management and trial monitoring, analysis, reporting, approval of data either on its own or jointly with academic/cooperative groups. Funding by industry of a trial run by academia/cooperative group was not considered as sponsorship. Among examined endpoints, any that was not a survival, response, safety, quality of life or health economic parameter, but was assumed to correlate with survival or response, was considered as a Surrogate endpoint. The impact of pre-specified interim analyses on the trials was also examined and recorded as trial discontinuation (in case superiority or futility was found), trial therapy unblinding, or trial continuation. Regarding metrics of research quality and impact, we recorded publication in a peer-reviewed medical journal present in Index Medicus, its 2009 impact factor, and the number of citations the published research had received by February 2011. Impact on Clinical Practice and Development of New Technology were considered valid if presented research led to either establishment/change of the daily oncologic practice or to the approval and use of new diagnostic, prognostic, or therapeutic biotechnological platforms.

Three analyses were applied: (a) comparison of oncological clinical research characteristics in ASCO and ESMO Congresses, (b) comparison of presented research characteristics on the basis of origin (US, EU and from both areas), and (c) changes in research characteristics in each of ASCO and ESMO Congresses during the three tertiles of the 2000–2010 decade (Trends over Time). The χ^2 test was applied in order to compare the distribution of research characteristics between categories.

Results

A total of 506 ASCO Congress oral presentations (breast cancer 224, lung cancer 171, colon cancer 111) and 239 ESMO Congress oral presentations (breast cancer 116, lung cancer 73, colon cancer 50) were identified by screening electronic and print records of the relevant Congresses from 2000 until 2010 (see Consort Diagram).

Demographics and basic characteristics

The relative contribution of each tumour type was similar in the two Congresses ($p = 0.27$). In the ASCO Congresses, oral presentations belonged more often to the adjuvant/neoadjuvant setting (ASCO 45.3% vs. ESMO 28.5%, $p = 0.0005$) and less so to the metastatic setting (ASCO 49% vs. ESMO 69%). Presented research originated from the EU in almost half (52%) of ASCO Congress and in 82% of ESMO Congress presentations. On the other hand, presentations originating from the US constituted 56.4% of ASCO Congress and only 26.7% of ESMO Congress oral sessions ($p = 0.0005$). Multicenter involvement in presented trials was the rule ($p = 0.001$), though more widespread in ASCO (93.8 vs. 85.8%). Industry sponsorship, as defined previously, was reported in a minority of presented trials, though it was more common in ESMO Congresses (ASCO 24.8% vs. ESMO 31.8%, $p = 0.047$). Finally, more ESMO Congress presentations were grouped in the Highlights/Proffered sessions (35.1%) than ASCO Congress research presented in the Plenary sessions (6.1%) ($p = 0.0005$), though the difference is mostly due to distinct definition and extent of the Highlights vs. Plenary sessions rather than the number of groundbreaking research presentations. Demographics are summarised in Table 1.

Methodological and reporting features

There was no difference in the relative contribution of the type of studies presented in ASCO and ESMO Congresses, the majority being phase III/IV and meta-analyses (76.3% in ASCO and 67.4% in ESMO, $p = 0.06$). Trials presented at ASCO Congresses were significantly larger ($p = 0.0005$), since the ones with more than 500 patients comprised 52.9% of the total oral ASCO presentations vs. 40.2% in ESMO, but were blinded less often (ASCO 9.5% vs. ESMO 16.2%, $p = 0.025$). Trials were presented at ASCO Congresses at a longer median follow-up than at ESMO (median FU longer than 24 months in 50.9% of ASCO presentations vs. 34.4% of ESMO presentations, $p = 0.0005$). There was a non significant trend for more frequent use of Overall Survival (OS) as the primary endpoint in trials presented at ASCO Congresses in contrast to that of Event-Free Survival (EFS, relapse-free or progression-free survival) and Surrogate endpoints in trials presented at ESMO Congresses ($p = 0.088$).

Table 1
Demographics and basic characteristics.

Characteristic	ASCO *N*	ASCO (%)	ESMO *N*	ESMO (%)	2-Sided *p* value
Tumour type	506		239		
Breast Cancer		44.3		50.7	
Lung Cancer		33.8		29.7	
Colon Cancer		21.9		19.7	0.27
Setting	506		239		
Adjuvant/neoadjuvant		45.3		28.5	
Locoregional		4.3			
Metastatic		49		69	
Prevention/epidemiology		1.4		2.5	**0.0005**
Origin	506		239		
US		35		9	
US + World		7.4		1.7	
US + EU		14		16	
EU		31		57	
EU + World		7		9	
Not US nor EU		6.1		7	
EU-involved		52		82	
US-involved		56.4		26.7	**0.0005**
Ethnicity	477		239		
National		62.7		59.4	
Multinational		37.3		40.6	0.39
Centers involved	476		239		
Single center		6.2		14.2	
Multi center		93.8		85.8	**0.001**
Sponsorship	476		239		
Academia/Cooperative Group only		75.2		68.2	
Industry involved		24.8		31.8	**0.047**
Scientific Field	506		239		
Basic Science		17		17.2	
Clinical ± translational		83		82.8	0.95
Presented in Plenary Session	506		155		
Yes		6.1		35.1	
No		93.9		64.9	**0.0005**
Biomarkers evaluated	476		231		
Yes		41.6		45.9	
No		58.4		54.1	0.28

% Percentage total in columns (total % of ASCO cases, total % of ESMO cases).