**Supplemental Table 1: Endpoint information of phase III anticancer clinical trials (*N*=400).**

|  |  |
| --- | --- |
| Variables | *n* (%) |
| Single/multiple endpoint |  |
|  | Single endpoint (*n*=336) |  |
|  |  PFS | 150 (44.6) |
|  |  OS | 97 (28.9) |
|  |  ORR | 35 (10.4) |
|  |  DFS | 24 (7.1) |
|  | Multiple endpoint (*n*=64) |  |
|  | OS and PFS | 47 (73.4) |
|  | ORR and BOR | 8 (12.5) |
|  | OS and ORR | 4 (6.3) |
| Specific classification |  |
|  | Overall survival | 154 (38.5) |
|  | Surrogate endpoint | 295 (73.8) |
|  |  Radiology-based endpoint | 281 (70.3) |
|  |  Time-to-event endpoint | 243 (60.8) |
|  |  Tumor-response endpoint | 40 (10.0) |
|  |  Pathology-based endpoint | 9 (2.3) |
|  |  Blood-based endpoint | 8 (2.0) |

OS: Overall survival; PFS: Progression-free survival; ORR: Objective response rate; DFS: Disease-free survival; BOR: Best overall response.

**Supplemental Table 2: Distribution of endpoints of phase III anticancer clinical trials among groups.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variables | Single endpoint(*n*=336) | Multiple endpoints(*n*=64) | *χ*2 | *P*-value |
| Stage of treatment\* |  |  | 3.36 | 0.186 |
| Neoadjuvant/Adjuvant | 42 (13.1) | 6 (9.4) |  |  |
| First-line | 165 (51.6) | 41 (64.1) |  |  |
| Second or Sequent-line | 113 (35.3) | 17 (26.6) |  |  |
| 5-Year survival rates†,‡ |  |  | 4.07 | 0.131 |
| >59.8% | 86 (26.7) | 11 (18.6) |  |  |
| 26.7-59.8% | 101 (31.4) | 15 (25.4) |  |  |
| <26.7% | 135 (41.9) | 33 (55.9) |  |  |
| Immunotherapy drugs |  |  | 65.77 | <0.001  |
| No | 257 (76.5) | 16 (25.0) |  |  |
| Yes | 79 (23.5) | 48 (75.0) |  |  |
| Targeted drugs |  |  | 4.78 | 0.029  |
| No | 71 (21.1) | 6 (9.4) |  |  |
| Yes | 265 (78.9) | 58 (90.6) |  |  |
| Cytotoxic drugs |  |  | 3.02 | 0.082  |
| No | 303 (90.2) | 62 (96.9) |  |  |
| Yes | 33 (9.8) | 2 (3.1) |  |  |
| Endocrine therapy drugs |  |  | 0.25 | 0.617  |
| No | 320 (95.2) | 60 (93.8) |  |  |
| Yes | 16 (4.8) | 4 (6.3) |  |  |
| Masking |  |  | 1.16 | 0.559  |
| Single-blind | 6 (1.8) | 0 (0.0) |  |  |
| Double blind | 210 (62.5) | 41 (64.1) |  |  |
| Open-label | 120 (35.7) | 23 (35.9) |  |  |
| Collaboration pattern |  |  | 12.31 | <0.001  |
| Global study | 172 (51.2) | 48 (75.0) |  |  |
| Domestic study | 164 (48.8) | 16 (25.0) |  |  |
| Data and safety monitoring board |  |  | 15.60 | <0.001  |
| No | 134 (39.9) | 9 (14.1) |  |  |
| Yes | 202 (60.1) | 55 (85.9) |  |  |
| Drug registration classification |  |  | 16.15 | <0.001  |
| Chemical drugs | 179 (53.3) | 17 (26.6) |  |  |
| Biological products | 155 (46.1) | 47 (73.4) |  |  |
| Traditional Chinese drugs/natural drugs | 2 (0.6) | 0 (0) |  |  |

\*16 in single endpoint group were missing; †More than one cancer type used for 14 in single endpoint group and 5 in multiple endpoint group. ‡The interquartile range according to the newly published cancer survival rate data in China.[1]

**Table 3: Comparison of overall survival and surrogate endpoints for phase III anticancer clinical trials.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variables | OS(*n*=97) | Surrogate endpoints(*n*=233) | *χ*2 | *P*-value |
| Stage of treatment\* |  |  | 26.47 | <0.001 |
| Neoadjuvant/Adjuvant | 1 (2.4) | 40 (97.6) |  |  |
| First-line | 44 (27.0) | 119 (73.0) |  |  |
| Second or Sequent-line | 50 (44.3) | 63 (55.8) |  |  |
| 5-Year survival rates† ‡ |  |  | 19.89 | <0.001 |
| >59.8% | 9 (10.8) | 74 (89.2) |  |  |
| 26.7-59.8% | 35 (35.7) | 63 (64.3) |  |  |
| <26.7% | 51 (37.8) | 84 (62.2) |  |  |
| Immunotherapy drugs |  |  | 7.67 | 0.006  |
| No | 64 (25.5) | 187 (74.5) |  |  |
| Yes | 33 (41.8) | 46 (58.2) |  |  |
| Targeted drugs |  |  | 3.23 | 0.072  |
| No | 26 (38.2) | 42 (61.8) |  |  |
| Yes | 71 (27.1) | 191 (72.9) |  |  |
| Cytotoxic drugs |  |  | 0.86 | 0.354  |
| No | 85 (28.6) | 212 (71.4) |  |  |
| Yes | 12 (36.4) | 21 (63.6) |  |  |
| Endocrine therapy drugs |  |  | 0.67 | 0.414  |
| No | 94 (29.8) | 221 (70.2) |  |  |
| Yes | 3 (20.0) | 12 (80.0) |  |  |
| Masking |  |  | 3.61 | 0.164  |
| Single-blind | 3 (50.0) | 3 (50.0) |  |  |
| Double blind | 54 (26.1) | 153 (73.9) |  |  |
| Open-label | 40 (34.2) | 77 (65.8) |  |  |
| Collaboration pattern |  |  | 2.43 | 0.119  |
| Global study | 57 (33.1) | 115 (66.9) |  |  |
| Domestic study | 40 (25.3) | 118 (74.7) |  |  |
| Data and safety monitoring board |  |  | 1.32 | 0.251  |  |
| No | 33 (25.8) | 95 (74.2) |  |  |  |
| Yes | 64 (31.7) | 138 (68.3) |  |  |  |
| Drug registration classification |  |  | 6.30 | 0.043  |  |
| Chemical drugs | 46 (26.1) | 130 (73.9) |  |  |  |
| Biological products | 49 (32.2) | 103 (67.8) |  |  |  |
| Traditional Chinese drugs/Natural drugs | 2 (100.0) | 0 (0.0) |  |  |  |

\*2 in OS group and 11 in surrogate endpoints group were missing; †More than one cancer type used for 2 in OS group and 12 in surrogate endpoints group. ‡The interquartile range according to the newly published cancer survival rate data in China.[1]

**Reference**

1. Zeng H, Chen W, Zheng R, Zhang S, Ji JS, Zou X, et al. Changing cancer survival in China during 2003-15: a pooled analysis of 17 population-based cancer registries. *Lancet Glob Health* 2018;**6**:e555-e567.



**Supplemental Figure 1 Flow Chart of Data Processing**