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| Supplementary Table **1**. Ongoing international clinical trials evaluating immunotherapy for ES-SCLC patients |
| Indentifier | Study Type | Setting and design | Arm | Phase | Drug＊ | Target population | Primary objective | Condition or disease | Status |
| NCT03325816 | Interventional | Randomized Open Label | 2 | I/II | Nivolumab | 56 | PFS | ES-SCLC | Ongoing |
| NCT04063163 | Interventional  | Randomized Double-Blind | 2 | III | HLX 10 | 489 | PFS | ES-SCLC | Ongoing |
| NCT02580994 | Interventional  | Randomized Double-blind | 2 | II | Pembrolizumab | 125 | PFS | Untreated ES-SCLC | Ongoing |
| NCT03382561 | Interventional  | Randomized Double-blind | 2 | II | Nivolumab | 150 | PFS | ES-SCLC | Ongoing |
| NCT03066778 | Interventional  | Randomized Double-blind | 2 | III | Pembrolizumab | 430 | PFS and OS | ES-SCLC | Ongoing |
| NCT03041311 | Interventional  | Randomized Double-blind | 2 | II | Atezolizumab  | 100 | OS and AEs | ES-SCLC | Ongoing |
| ***＊immune checkpoint inhibitors******PFS, progression-free survival; OS, overall survival; AEs adverse event; ES-SCLC, extensive-stage small cell lung cancer.*** |

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| **Supplementary Table 2.** Quality assessment: risk of bias by Cochrane Collaboration’s tool |
| Clinical trials | Year | Sequence generation | Allocation concealment | Blinding | Incomplete outcome data | Selective reporting | Other source of bias |
| CASPIAN(NCT03043872) | 2019 | Adequate | Adequate (Central allocation) | Adequate | Adequate | Adequate | No |
| CA209-451(NCT02538666) | 2019 | Adequate | Adequate (Central allocation) | Adequate | Adequate | Adequate | No |
| IMpower133(NCT02763579) | 2018 | Adequate | Adequate (Central allocation) | Adequate | Adequate | Adequate | No |
| CA184-156(NCT01450761) | 2016 | Adequate | Adequate (Central allocation) | Adequate | Adequate | Adequate | No |
| CA184-041(NCT00527735) | 2012 | Adequate | Adequate (Central allocation) | Adequate | Adequate | Adequate | No |

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| **Supplementary Table 3.** Additional characteristics of patients comparing immunotherapy with chemotherapy in included trials |
| Clinical trials | Year | Setting and design | Phase | Primary End Point | Secondary End Point | Disease |
| CASPIAN(NCT03043872) | 2019 | Randomized, Open-Label | III | OS | PFS, ORR | ES-SCLC |
| CA209-451(NCT02538666) | 2019 | Randomized, Double-Blind | III | OS | OS, PFS | ES-SCLC |
| IMpower133(NCT02763579) | 2018 | Randomized, Double-Blind | I/III | PFS, OS | OR, DOR | ES-SCLC |
| CA184-156(NCT01450761) | 2016 | Randomized, Double-Blind | III | OS | OS, PFS | ES-SCLC |
| CA184-041(NCT00527735) | 2012 | Randomized, Double-Blind | II | PFS | PFS, OS, DOR, AEs | ES-SCLC |
| ***PFS, progression-free survival; OS, overall survival; AEs, adverse events; DOR, duration of response; ES-SCLC, extensive-stage small cell lung cancer.*** |

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| **Supplementary Table 4.** Main outcomes of the included trials |
| Clinical trials | PFS (months) | OS (months) | ORR (%) | S-AEs (Events/Enrolled) |
|  | EG | CG | EG | CG | EG | CG | EG | CG |
| CASPIAN(NCT03043872) | 5.10 (4.70-6.20) | 5.40 (4.80-6.20) | 13.00 (11.50-14.80) | 10.30 (9.30-11.20) | 67.91 | 57.62 | 35/265 | 50/266 |
| CA209-451(NCT02538666) | 1.87 (1.61-2.63) | 1.45 (1.41-1.48) | 10.41 (9.46-12.12) | 9.56 (8.18-11.01) | NR | NR | 76/198 | 93/196 |
| IMpower133(NCT02763579) | 5.20 (4.40-5.60) | 5.20 (4.40-5.70) | 12.30 (10.80-15.90) | 10.30 (9.30-11.30) | 60.20 | 64.36 | 74/478 | 68/476 |
| CA184-156(NCT01450761) | 4.60 (4.50-5.00) | 4.40 (4.40-4.60) | 11.00 (10.50-11.30) | 10.90 (10.00-11.50) | 62.13 | 62.18 | 131/273 | 61/279 |
| CA184-041(NCT00527735) | 6.44 (5.29-7.75) | 5.26 (4.67-5.72) | 12.94 (7.89-16.46) | 9.92 (8.64-11.73) | 71.43 | 53.33 | NR | NR |
| ***PFS, progression-free survival; OS, overall survival; ORR, objective response rate; S-AEs, serious adverse events; EG, experimental group; CG, control group; NR, not reached.*** |

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| **Supplementary Table 5.** Summary of the data status for subgroup-analyses of OS among the included trials |
| Source | **Year** | Gender | Age | ECOG PS | BM | TMB | ICI | ICI＊ |
| CASPIAN(NCT03043872) | 2019 | Y | Y | Y | Y | N | Y | Y |
| CA209-451(NCT02538666) | 2019 | N | N | N | N | N | Y | Y |
| IMpower133(NCT02763579) | 2018 | Y | Y | Y | Y | Y | Y | Y |
| CA184-156(NCT01450761) | 2016 | Y | N | Y | Y | N | Y | Y |
| CA184-041(NCT00527735) | 2012 | N | N | N | N | N | Y | Y |
| ***ECOG PS, eastern cooperative oncology group performance status; BM, brain metastases; TMB, tumor mutational burdenes; ICI, immune checkpoint inhibitor***  |
| ***＊Summary of the data status for subgroup-analyses of PFS*** |