**Supplementary Table 1. Search Strategies for PubMed, Scopus, Web of Science, and Cochrane**

|  |  |  |  |
| --- | --- | --- | --- |
| **Search Engine** | **Search strategy** | **Additional**  **filters** | **No.** |
| **PubMed** | (semaglutide[Supplementary Concept]) AND (((tirzepatide[Supplementary Concept]) OR (Liraglutide[MeSH Terms])) OR (dulaglutide[Supplementary Concept])) | **English,**  **5 February 2025** | 215 |
| **Scopus** | ( ( TITLE-ABS-KEY ( tirzepatide ) OR TITLE-ABS-KEY ( mounjaro ) OR TITLE-ABS-KEY ( ly3298176 ) OR TITLE-ABS-KEY (liraglutide) OR TITLE-ABS-KEY (Victoza) OR TITLE-ABS-KEY (Saxenda) OR TITLE-ABS-KEY (NN 2211) OR TITLE-ABS-KEY (2211, NN) OR TITLE-ABS-KEY (NN2211) OR TITLE-ABS-KEY (NN-2211) OR TITLE-ABS-KEY ( dulaglutide ) OR TITLE-ABS-KEY ( LY 2189265 ) OR TITLE-ABS-KEY ( LY-2189265 ) OR TITLE-ABS-KEY ( LY2189265 ) OR TITLE-ABS-KEY (Trulicity) ) ) AND ( ( TITLE-ABS-KEY ( semaglutide ) OR TITLE-ABS-KEY ( rybelsus ) OR TITLE-ABS-KEY ( ozempic ) ) ) | **English,**  **5 February 2025** | 906 |
| **Web Of Science** | #1: Tirzepatide (Title) or Mounjaro (Title) or LY3298176 (Title)  #2: liraglutide (Title) or Victoza (Title) or Saxenda (Title) or NN 2211 (Title) or 2211, NN (Title) or NN2211 (Title) or NN-2211 (Title)  #3: dulaglutide (Title) or LY 2189265 (Title) or LY-2189265 (Title) or LY2189265 (Title) or Trulicity (Title)  #4: Semaglutide (Title) or rybelsus (Title) or Ozempic (Title)  #5: #1 OR #2 OR #3  Final: #4 And #5 | **English,**  **5 February 2025** | 220 |
| **Cochrane** | #1: (tirzepatide):ti,ab,kw OR (Mounjaro):ti,ab,kw OR (LY3298176):ti,ab,kw  #2: MeSH descriptor: [Liraglutide] explode all trees  #3: (dulaglutide):ti,ab,kw OR (LY 2189265):ti,ab,kw OR (LY-2189265):ti,ab,kw OR (LY2189265):ti,ab,kw OR (Trulicity):ti,ab,kw  #4: (semaglutide):ti,ab,kw OR (Rybelsus):ti,ab,kw OR (Ozempic):ti,ab,kw  #5: #1 OR #2 OR #3  Final: #4 And #5 | **English,**  **5 February 2025** | 229 |

**Supplementary Table 2. Assessment of Risk of Bias**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Study** | **Random sequence generation** | **Allocation concealment** | **Selective reporting** | **Blinding of participants / personal** | **Blinding of outcome assessment** | **Incomplete outcome data** | **Other bias** |
| Heise et al.(1) |  |  |  |  |  |  |  |
| Frias et al.(2) |  |  |  |  |  |  |  |
| Takahashi et al.(3) |  |  |  |  |  |  |  |
| Pratley RE et al. (4) |  |  |  |  |  |  |  |
| T.Iijima et al.(5) |  |  |  |  |  |  |  |
| Pratley et al.(6) |  |  |  |  |  |  |  |
| O’Neil et al.(7) |  |  |  |  |  |  |  |
| Capehorn et al.(8) |  |  |  |  |  |  |  |
| Nauck et al.(9) |  |  |  |  |  |  |  |
| Lingvay et al.(10) |  |  |  |  |  |  |  |
| Rubino et al.(11) |  |  |  |  |  |  |  |

**Supplementary Table 3: Tirzepatide vs Semaglutide**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author** | **Published year** | **Study design** | **Duration (Weeks)** | **Mean dose (mg) of weekly Semaglutide** | **Mean dose (mg) of weekly Tirzepatide** | **Population Semaglutide** | **Population Tirzepatide** | **Total mean age (SD)** | **Total male number (%)** | **Baseline HbA1c (%) Semaglutide (SD)** | **Baseline HbA1c (%) Tirzepatide (SD)** | **Baseline weight (kg) Semaglutide (SD)** | **Baseline weight(kg) Tirzepatide (SD)** | **Baseline FBS (mg/dl) Semaglutide (SD)** | **Baseline FBS (mg/dl) Tirzepatide (SD)** | **Baseline BMI (kg/m2) Semaglutide (SD)** | **Baseline BMI (kg/m2) Tirzepatide (SD)** |
| Heise et al.(1) | 2022 | RCT | 28 | 1 | 15 | 44 | 45 | 62.3 (6.5) | 65 (73%) | 7.70 (0.60) | 7.83 (0.72) | 92.65 (14.01) | 94.15 (13.99) | 128.6 (25.0) | 139.3 (30.2) | 30.82 (3.84) | 31.28 (5.01) |
| Frias et al. (2) | 2023 | RCT | 40 | 1 | 15 | 469 | 470 | 56.3 (10.6) | 439 (46%) | 8.25 (1.01) | 8.26 (1.00) | 93.7 (21.12) | 93.8 (21.83) | 171.4 (49.77) | 172.4 (54.37) | 34.2 (7.15) | 34.5 (7.11) |

**Supplementary Table 4: Liraglutide vs Semaglutide**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author** | **Published year** | **Study design** | **Duration (weeks)** | **Mean dose (mg) of daily Liraglutide** | **Mean dose (mg) of weekly Semaglutide** | **Population Liraglutide** | **Population Semaglutide** | **Total mean age (SD)** | **Total male number (%)** | **Baseline HbA1c (%) Liraglutide (SD)** | **Baseline HbA1c (%) Semaglutide (SD)** | **Baseline weight (kg) Liraglutide (SD)** | **Baseline weight (kg) Semaglutide (SD)** | **Baseline FBS (mg/dl) Liraglutide (SD)** | **Baseline FBS (mg/dl) Semaglutide (SD)** | **Baseline BMI (kg/m2) Liraglutide (SD)** | **Baseline BMI (kg/m2) Semaglutide (SD)** |
| Nauck et al.(9) | 2016 | RCT | 12 | 1.5 | 0.65 | 95 | 270 | 55 (9.7) | 237 (64%) | 8.05 (0.74) | 8.11 (0.84) | 88.76 (13.29) | 86.51 (14.18) | 165 (38.69) | 170.19 (41.38) | 30.94 (4.6) | 30.72 (4.41) |
| Lingvay et al.(10) | 2018 | RCT | 26 | 0.78 | 7.91 | 257 | 319 | 56.7(9.9) | 310 (53%) | 8.1 (0.84) | 8.01 (0.8) | 93.77 (17.93) | 94.81 (18.85) | 170.05 (45.18) | 169.07 (44.53) | 32.76 (4.53) | 32.82 (4.17) |
| Rubino et al.(11) | 2022 | RCT | 68 | 3 | 2.4 | 127 | 126 | 48.5(13.6) | 54 (21%) | 5.5 (0.3) | 5.5 (0.3) | 103.7 (22.5) | 102.5 (25.3) | 95.2 (8.5) | 96.1 (10.2) | 37.2 (6.4) | 37.0 (7.4) |
| Pratley et al.(6) | 2019 | RCT | 52 | 1.8 | 98 (14 mg daily oral doses) | 284 | 285 | 56(10) | 296 (52%) | 8.0 (0.7) | 8.0 (0.7) | 95.5 (21.9) | 92.9 (20.6) | 167.56 (39.99) | 167.02 (40.18) | 33.4 (6.7) | 32.5 (5.9) |
| Neil et al.(7) | 2018 | RCT | 52 | 3 | 1.75 | 103 | 718 | 47(12) | 290 (35%) | 5·5 (0·4) | 5.48 (0.4) | 108·7 (21·9) | 111.35 (23.2) | 99.09 (237.6) | 98.07 (231.7) | 38·6 (6·6) | 39.28 (7.06) |
| Capehorn et al.(8) | 2020 | RCT | 30 | 1.2 | 1 | 287 | 290 | 59.5(10.3) | 237 (41%) | 8.3 (1.0) | 8.2 (0.9) | 97.2 (21.7) | 96.6 (21.0) | 178.37 (45.04) | 176.57 (41.44) | 33.7 (7.0) | 33.7 (6.6) |
| Takahashi et al.(3) | 2023 | RCT | 24 | 1.35 | 0.75 | 18 | 19 | 60.2(18.3) | 24 (64%) | 7.8 (1.0) | 7.9 (0.7) | 83.9 (21.3) | 86.2 (18.3) | 137.0 (35.2) | 126 (35.27) | 29.8 (3.4) | 30.1 (7.1) |
| Rana et al.(12) | 2023 | Cohort | 24 | 1.4 | 0.7 | 77 | 77 | 69.5(9.3) | 146 (94%) | 9.2 (1.7) | 8.9 (1.4) | 106.6 (20.3) | 108.6 (38.7) | **-** | **-** | **-** | **-** |

**Supplementary Table 5: Dulaglutide vs Semaglutide**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author** | **Published year** | **Study design** | **Duration (weeks)** | **Mean dose (mg) of weekly Dulaglutide** | **Mean dose (mg) of weekly Semaglutide** | **Population Dulaglutide** | **Population Semaglutide** | **Total mean age (SD)** | **Total male number (%)** | **Baseline HbA1c (%) Dulaglutide (SD)** | **Baseline HbA1c (%) Semaglutide (SD)** | **Baseline weight (kg) Dulaglutide (SD)** | **Baseline weight (kg) Semaglutide (SD)** | **Baseline FBS (mg/dl) Dulaglutide (SD)** | **Baseline FBS (mg/dl) Semaglutide (SD)** | **Baseline BMI (kg/m2) Dulaglutide (SD)** | **Baseline BMI (kg/m2) Semaglutide (SD)** |
| Takahashi et al.(3) | 2023 | RCT | 24 | 0.75 | 0.75 | 32 | 31 | 62.6) 17( | 33 (52%) | 7.8 (1.0) | 7.8 (0.8) | 73.4 (15.3) | 73.5 (26.6) | 135.6 (28.9) | 142.8 (28.2) | 28.1 (4) | 26.9 (5) |
| lacobellis et al.(13) | 2020 | RCT | 12 | 1.5 | 1 | 30 | 30 | 56) 8.9( | 34 (56%) | 8.2 (1.2) | 7.3 (1.2) | 106 (21) | 105 (14) | - | - | 36.5 (6) | 34.3 (5) |
| Pratley et al.(4) | 2018 | RCT | 40 | 0.75 | 0.5 | 299 | 301 | 55.5)10.6( | 329 (54%) | 8.2 (0.9) | 8.3 (0.9) | 95.6 (23.0) | 96.4 (24.4) | 173.9 (47.7) | 176.3 (45.7) | 33.6 (6.9) | 33.7 (7.1) |
| Pratley et al.(4) | 2018 | RCT | 40 | 1.5 | 1 | 299 | 300 | 55.5)10.6( | 333 (55%) | 8.2 (0.9) | 8.2 (0.9) | 93.4 (21.8) | 95.5 (20.9) | 172.5 (41.2) | 177.1 (46.5) | 33.1 (6.6) | 33.6 (6.5) |

**Supplementary Table 6: Switching from Liraglutide to Semaglutide**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author** | **Published year** | **Study design** | **Duration (weeks)** | **Mean dose (mg) of weekly Semaglutide** | **Population** | **Total mean age (SD)** | **Total male number (%)** | **Baseline HbA1c (%) Semaglutide (SD)** | **Baseline weight (kg) Semaglutide (SD)** | **Baseline FBS (mg/dl) Semaglutide (SD)** | **Baseline BMI (kg/m2) Semaglutide (SD)** |
| Jain et al.(14) | 2021 | Cohort | 48 | 1 | 139 | 58 (10.6) | 81 (58%) | 7.9 (1.1) | 98.5 (17.5) |  | 33.1 (5.63) |
| Takahashi et al.(3) | 2023 | RCT | 24 | 0.75 | 19 | 59.6 (18.4) | 12 (63%) | 7.9 (0.7) | 86.2 (18.3) | 126 (35.27) | 30.1 (7.1) |
| Hayek et al.(15) | 2022 | Cohort | 12 | 0.58 | 52 | 48 (6) | 25 (48%) | 8.2 (0.2) | 87.15 (8) | - | 32.5 (2.7) |
| Lijima et al.(5) | 2023 | RCT | 26 | 0.5 | 16 | 61.5 (11.2) | 11 (68%) | 6.5 (0.8) | 73.4 (20.4) | 121.9 (16) | 27 (6.6) |

**Supplementary Table 7: Switching from Dulaglutide to Semaglutide**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author** | **Published**  **year** | **Study**  **design** | **Duration (weeks)** | **Mean dose (mg) of weekly Semaglutide** | **Population** | **Total mean age (SD)** | **Total male number (%)** | **Baseline HbA1c (%) Semaglutide (SD)** | **Baseline weight (kg) Semaglutide (SD)** | **Baseline FBS (mg/dl) Semaglutide (SD)** | **Baseline BMI (kg/m2) Semaglutide (SD)** |
| Jain et al.(14) | 2021 | Cohort | 48 | 1 | 25 | 58 (10.6) | 14 (56%) | 7.9 (1.1) | 98.5 (17.5) | - | 33.1 (5.63) |
| Takahashi et al.(3) | 2023 | RCT | 24 | 0.75 | 31 | 64.6 (16.3) | 20 (64%) | 7.8 (0.8) | 73.5 (26.6) | 142.8 (28.2) | 26.9 (5) |
| Kimura et al. (16) | 2024 | Cohort | 6 | 1 | 13 | 54 (9.9) | 10 (77%) | 8.2 (1.1) | 1.1 | - | - |

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