

Supplementary Data

Epidemiology, Co-Morbidities, and Medication Use of Patients with Alzheimer's Disease or Vascular Dementia in the UK

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Supplementary Table 1

Prevalence of co-morbidities in younger-old (i.e., those aged between 65–74 years) patients with Alzheimer's disease or vascular dementia and corresponding dementia-free controls

| Co-morbidities | Alzheimer's disease | | | | Vascular dementia | | | | | | | |
|---|----------------------|--------|-------------------------|--------|-------------------|-------------|--------------------|--------|-----------------------|--------|------|-------------|
| | Cases (n = 1,305) | | Controls (n = 1,306) | | OR | (95% CI) | Cases (n = 598) | | Controls (n = 600) | | | |
| | n | (%) | n | (%) | | | n | (%) | n | (%) | | |
| <i>Cardiovascular</i> | | | | | | | | | | | | |
| Congestive heart failure | 32 | (2.5) | 46 | (3.5) | 0.67 | (0.42–1.06) | 51 | (8.5) | 31 | (5.2) | 1.71 | (1.08–2.73) |
| Atrial fibrillation | 47 | (3.6) | 67 | (5.1) | 0.69 | (0.47–1.01) | 74 | (12.4) | 36 | (6.0) | 2.19 | (1.44–3.32) |
| Ischemic heart disease | 210 | (16.1) | 218 | (16.7) | 0.96 | (0.78–1.17) | 168 | (28.1) | 130 | (21.7) | 1.43 | (1.09–1.88) |
| Hypertension | 400 | (30.7) | 540 | (41.4) | 0.61 | (0.51–0.72) | 328 | (54.9) | 253 | (42.2) | 1.69 | (1.33–2.15) |
| Diabetes mellitus | 105 | (8.1) | 137 | (10.5) | 0.75 | (0.57–0.97) | 119 | (19.9) | 73 | (12.2) | 1.79 | (1.29–2.47) |
| Hypercholesterolemia | 201 | (15.4) | 176 | (13.5) | 1.18 | (0.94–1.47) | 112 | (18.7) | 92 | (15.3) | 1.28 | (0.93–1.76) |
| Orthostatic hypotension | 27 | (2.1) | 7 | (0.5) | 3.86 | (1.68–8.86) | 16 | (2.7) | 8 | (1.3) | 2.00 | (0.86–4.67) |
| <i>Inflammatory, endocrine, metabolic</i> | | | | | | | | | | | | |
| COPD | 63 | (4.8) | 92 | (7.0) | 0.67 | (0.48–0.93) | 55 | (9.2) | 44 | (7.3) | 1.31 | (0.86–1.98) |
| Osteoporosis | 91 | (7.0) | 76 | (5.8) | 1.23 | (0.89–1.70) | 35 | (5.9) | 32 | (5.3) | 1.11 | (0.66–1.87) |
| Inflammatory bowel disease | 18 | (1.4) | 14 | (1.1) | 1.31 | (0.64–2.69) | 10 | (1.7) | 5 | (0.8) | 2.00 | (0.68–5.85) |
| Thyroid disorders | 142 | (10.9) | 145 | (11.1) | 0.98 | (0.76–1.27) | 56 | (9.4) | 41 | (6.8) | 1.43 | (0.93–2.20) |
| Rheumatoid arthritis | 20 | (1.5) | 41 | (3.1) | 0.46 | (0.26–0.81) | 14 | (2.3) | 21 | (3.5) | 0.67 | (0.34–1.31) |
| <i>Central nervous system</i> | | | | | | | | | | | | |
| Epilepsy/seizures | 48 | (3.7) | 29 | (2.2) | 1.70 | (1.06–2.74) | 46 | (7.7) | 12 | (2.0) | 4.00 | (2.07–7.74) |
| Depression | 360 | (27.6) | 198 | (15.2) | 2.15 | (1.76–2.63) | 189 | (31.6) | 89 | (14.8) | 2.75 | (2.03–3.73) |

n, number; OR, odds ratio; CI, confidence interval; COPD, chronic obstructive pulmonary disease.

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Supplementary Table 2

Prevalence of co-morbidities in older-old (i.e., those aged between 75–84 years) patients with Alzheimer's disease or vascular dementia and corresponding dementia-free controls

| Co-morbidities | Alzheimer's disease | | | | Vascular dementia | | | | | | | |
|---|----------------------|--------|-------------------------|--------|-------------------|-------------|----------------------|--------|-------------------------|--------|------|-------------|
| | Cases (n = 3,668) | | Controls (n = 3,672) | | OR | (95% CI) | Cases (n = 2,136) | | Controls (n = 2,146) | | | |
| | n | (%) | n | (%) | | | n | (%) | n | (%) | | |
| <i>Cardiovascular</i> | | | | | | | | | | | | |
| Congestive heart failure | 206 | (5.6) | 309 | (8.4) | 0.63 | (0.53–0.76) | 271 | (12.7) | 179 | (8.3) | 1.60 | (1.31–1.97) |
| Atrial fibrillation | 276 | (7.5) | 369 | (10.1) | 0.73 | (0.62–0.85) | 379 | (17.7) | 220 | (10.3) | 1.90 | (1.59–2.28) |
| Ischemic heart disease | 678 | (18.5) | 910 | (24.8) | 0.68 | (0.61–0.76) | 623 | (29.2) | 542 | (25.3) | 1.23 | (1.07–1.41) |
| Hypertension | 1,407 | (38.4) | 1,827 | (49.8) | 0.62 | (0.56–0.68) | 1132 | (53.0) | 1016 | (47.3) | 1.26 | (1.12–1.43) |
| Diabetes mellitus | 311 | (8.5) | 427 | (11.6) | 0.70 | (0.60–0.82) | 351 | (16.4) | 232 | (10.8) | 1.62 | (1.36–1.95) |
| Hypercholesterolemia | 364 | (9.9) | 438 | (11.9) | 0.80 | (0.69–0.94) | 246 | (11.5) | 237 | (11.0) | 1.04 | (0.85–1.27) |
| Orthostatic hypotension | 101 | (2.8) | 65 | (1.8) | 1.57 | (1.15–2.16) | 90 | (4.2) | 43 | (2.0) | 2.18 | (1.49–3.18) |
| <i>Inflammatory, endocrine, metabolic</i> | | | | | | | | | | | | |
| COPD | 186 | (5.1) | 295 | (8.0) | 0.60 | (0.50–0.73) | 201 | (9.4) | 182 | (8.5) | 1.15 | (0.94–1.42) |
| Osteoporosis | 352 | (9.6) | 357 | (9.7) | 0.98 | (0.84–1.16) | 201 | (9.4) | 181 | (8.4) | 1.16 | (0.93–1.44) |
| Inflammatory bowel disease | 33 | (0.9) | 40 | (1.1) | 0.83 | (0.52–1.31) | 32 | (1.5) | 24 | (1.1) | 1.35 | (0.79–2.31) |
| Thyroid disorders | 451 | (12.3) | 464 | (12.6) | 0.96 | (0.84–1.11) | 284 | (13.3) | 225 | (10.5) | 1.34 | (1.11–1.62) |
| Rheumatoid arthritis | 92 | (2.5) | 105 | (2.9) | 0.87 | (0.66–1.16) | 46 | (2.2) | 65 | (3.0) | 0.70 | (0.48–1.03) |
| <i>Central nervous system</i> | | | | | | | | | | | | |
| Epilepsy/seizures | 56 | (1.5) | 47 | (1.3) | 1.20 | (0.81–1.77) | 113 | (5.3) | 31 | (1.4) | 3.65 | (2.45–5.42) |
| Depression | 768 | (20.9) | 567 | (15.4) | 1.48 | (1.31–1.68) | 554 | (25.9) | 309 | (14.4) | 2.18 | (1.85–2.57) |

n, number; OR, odds ratio; CI, confidence interval; COPD, chronic obstructive pulmonary disease.

Supplementary Table 3

Prevalence of co-morbidities in the oldest-old (i.e., those aged 85+ years) patients with Alzheimer's disease or vascular dementia and corresponding dementia-free controls

| Co-morbidities | Alzheimer's disease | | | | Vascular dementia | | | | | | | |
|---|----------------------|--------|-------------------------|--------|-------------------|-------------|----------------------|--------|-------------------------|--------|------|-------------|
| | Cases (n = 2,113) | | Controls (n = 2,108) | | OR | (95% CI) | Cases (n = 1,704) | | Controls (n = 1,692) | | | |
| | n | (%) | n | (%) | | | n | (%) | n | (%) | | |
| <i>Cardiovascular</i> | | | | | | | | | | | | |
| Congestive heart failure | 210 | (9.9) | 322 | (15.3) | 0.61 | (0.50–0.73) | 278 | (16.3) | 255 | (15.1) | 1.10 | (0.92–1.33) |
| Atrial fibrillation | 194 | (9.2) | 305 | (14.5) | 0.60 | (0.49–0.73) | 361 | (21.2) | 247 | (14.6) | 1.56 | (1.30–1.86) |
| Ischemic heart disease | 367 | (17.4) | 502 | (23.8) | 0.67 | (0.57–0.78) | 438 | (25.7) | 427 | (25.2) | 1.03 | (0.88–1.21) |
| Hypertension | 820 | (38.8) | 978 | (46.4) | 0.72 | (0.63–0.82) | 839 | (49.2) | 810 | (47.9) | 1.06 | (0.92–1.22) |
| Diabetes mellitus | 154 | (7.3) | 183 | (8.7) | 0.83 | (0.67–1.04) | 185 | (10.9) | 169 | (10.0) | 1.09 | (0.88–1.36) |
| Hypercholesterolemia | 78 | (3.7) | 112 | (5.3) | 0.67 | (0.50–0.91) | 95 | (5.6) | 90 | (5.3) | 1.06 | (0.76–1.47) |
| Orthostatic hypotension | 78 | (3.7) | 59 | (2.8) | 1.33 | (0.95–1.88) | 92 | (5.4) | 54 | (3.2) | 1.76 | (1.24–2.49) |
| <i>Inflammatory, endocrine, metabolic</i> | | | | | | | | | | | | |
| COPD | 84 | (4.0) | 118 | (5.6) | 0.70 | (0.52–0.94) | 107 | (6.3) | 109 | (6.4) | 0.97 | (0.74–1.28) |
| Osteoporosis | 214 | (10.1) | 227 | (10.8) | 0.94 | (0.76–1.15) | 161 | (9.5) | 162 | (9.6) | 1.00 | (0.79–1.27) |
| Inflammatory bowel disease | 17 | (0.8) | 20 | (1.0) | 0.84 | (0.43–1.64) | 14 | (0.8) | 19 | (1.1) | 0.74 | (0.37–1.47) |
| Thyroid disorders | 260 | (12.3) | 268 | (12.7) | 0.98 | (0.81–1.18) | 216 | (12.7) | 199 | (11.8) | 1.09 | (0.88–1.34) |
| Rheumatoid arthritis | 47 | (2.2) | 53 | (2.5) | 0.87 | (0.58–1.29) | 45 | (2.6) | 22 | (1.3) | 2.05 | (1.23–3.41) |
| <i>Central nervous system</i> | | | | | | | | | | | | |
| Epilepsy/seizures | 40 | (1.9) | 36 | (1.7) | 1.11 | (0.71–1.74) | 56 | (3.3) | 41 | (2.4) | 1.39 | (0.92–2.09) |
| Depression | 399 | (18.9) | 315 | (14.9) | 1.36 | (1.15–1.61) | 378 | (22.2) | 238 | (14.1) | 1.83 | (1.52–2.21) |

n, number; OR, odds ratio; CI, confidence interval; COPD, chronic obstructive pulmonary disease.

Supplementary Table 4
 Exposure prevalence to various drugs in younger-old (i.e., those aged between 65–74 years) patients with Alzheimer's disease or vascular dementia and corresponding dementia-free controls

| Drugs | Alzheimer's disease | | | | Vascular dementia | | | | |
|---|----------------------|--------|-------------------------|--------|--------------------|--------|-----------------------|--------|---------------------|
| | Cases (n = 1,305) | | Controls (n = 1,306) | | Cases (n = 598) | | Controls (n = 600) | | |
| | n | (%) | n | (%) | n | (%) | n | (%) | |
| <i>Cardiovascular</i> | | | | | | | | | |
| ACE inhibitors | 184 | (14.1) | 229 | (17.5) | 176 | (29.4) | 117 | (19.5) | 2.04 (1.52–2.72) |
| AT-II antagonists | 43 | (3.3) | 89 | (6.8) | 49 | (8.2) | 33 | (5.5) | 1.54 (0.97–2.45) |
| Beta-blockers | 252 | (19.3) | 279 | (21.4) | 159 | (26.6) | 132 | (22.0) | 1.50 (1.13–1.99) |
| Calcium channel blockers | 169 | (13.0) | 244 | (18.7) | 155 | (25.9) | 124 | (20.7) | 1.50 (1.12–2.01) |
| Diuretics | 275 | (21.1) | 407 | (31.2) | 234 | (39.1) | 177 | (29.5) | 1.87 (1.43–2.44) |
| Vasodilators | 117 | (9.0) | 130 | (10.0) | 133 | (22.2) | 64 | (10.7) | 2.50 (1.78–3.50) |
| Anti-arrhythmics | 20 | (1.5) | 28 | (2.1) | 20 | (3.3) | 18 | (3.0) | 1.16 (0.59–2.28) |
| Oral antidiabetics | 74 | (5.7) | 80 | (6.1) | 75 | (12.5) | 48 | (8.0) | 1.72 (1.17–2.53) |
| Insulin | 14 | (1.1) | 26 | (2.0) | 29 | (4.9) | 19 | (3.2) | 1.56 (0.86–2.81) |
| Statins | 300 | (23.0) | 301 | (23.1) | 250 | (41.8) | 150 | (25.0) | 2.68 (1.99–3.62) |
| Antiplatelets | 100 | (7.7) | 102 | (7.8) | 135 | (22.6) | 44 | (7.3) | 4.12 (2.76–6.14) |
| Anticoagulants | 25 | (1.9) | 42 | (3.2) | 67 | (11.2) | 28 | (4.7) | 2.62 (1.65–4.17) |
| <i>Inflammatory, endocrine, metabolic</i> | | | | | | | | | |
| Antisteporotics | 67 | (5.1) | 57 | (4.4) | 23 | (3.9) | 24 | (4.0) | 0.91 (0.50–1.67) |
| Intestinal anti-inflammatory agents | 16 | (1.2) | 7 | (0.5) | 10 | (1.7) | 7 | (1.2) | 1.39 (0.53–3.67) |
| Corticosteroids | 69 | (5.3) | 127 | (9.7) | 47 | (7.9) | 56 | (9.3) | 0.88 (0.58–1.33) |
| NSAIDs | 276 | (21.2) | 293 | (22.4) | 118 | (19.7) | 135 | (22.5) | 0.78 (0.56–1.07) |
| Thyroid gland therapeutics | 108 | (8.3) | 123 | (9.4) | 43 | (7.2) | 31 | (5.2) | 1.45 (0.90–2.36) |
| <i>Central nervous system</i> | | | | | | | | | |
| Anticonvulsants | 56 | (4.3) | 34 | (2.6) | 58 | (9.7) | 16 | (2.7) | 4.23 (2.30–7.75) |
| Antidepressants | 414 | (31.7) | 161 | (12.3) | 228 | (38.1) | 71 | (11.8) | 5.48 (3.87–7.77) |
| Antipsychotics/neuroleptics | 133 | (10.2) | 61 | (4.7) | 97 | (16.2) | 43 | (7.2) | 2.72 (1.82–4.05) |
| Benzodiazepines | 178 | (13.6) | 121 | (9.3) | 107 | (17.9) | 44 | (7.3) | 3.16 (2.13–4.69) |

n, number; OR, odds ratio; CI, confidence interval; ACE, angiotensin-converting enzyme; AT, angiotensin; NSAIDs, nonsteroidal anti-inflammatory drugs.

Supplementary Table 5
Exposure prevalence to various drugs in patients older-old (i.e., those aged between 75–84 years) with Alzheimer's disease or vascular dementia and corresponding dementia-free controls

| Drugs | Alzheimer's disease | | | | Vascular dementia | | | |
|---|----------------------|--------|-------------------------|--------|----------------------|--------|-------------------------|--------|
| | Cases (n = 3,668) | | Controls (n = 3,672) | | Cases (n = 2,136) | | Controls (n = 2,146) | |
| | n | (%) | n | (%) | n | (%) | n | (%) |
| <i>Cardiovascular</i> | | | | | | | | |
| ACE inhibitors | 577 | (15.7) | 875 | (23.8) | 599 | (28.0) | 484 | (22.6) |
| AT-II antagonists | 154 | (4.2) | 310 | (8.4) | 159 | (7.4) | 181 | (8.4) |
| Beta-blockers | 671 | (18.3) | 920 | (25.1) | 517 | (24.2) | 490 | (22.8) |
| Calcium channel blockers | 652 | (17.8) | 861 | (23.5) | 566 | (26.5) | 541 | (25.2) |
| Diuretics | 1182 | (32.2) | 1701 | (46.3) | 1027 | (48.1) | 945 | (44.0) |
| Vasodilators | 408 | (11.1) | 559 | (15.2) | 471 | (22.1) | 334 | (15.6) |
| Anti-arrhythmics | 74 | (2.0) | 132 | (3.6) | 59 | (2.8) | 69 | (3.2) |
| Oral antidiabetics | 185 | (5.0) | 250 | (6.8) | 221 | (10.4) | 143 | (6.7) |
| Insulin | 41 | (1.1) | 66 | (1.8) | 75 | (3.5) | 38 | (1.8) |
| Statins | 707 | (19.3) | 937 | (25.5) | 682 | (31.9) | 479 | (22.3) |
| Antiplatelets | 333 | (9.1) | 390 | (10.6) | 417 | (19.5) | 202 | (9.4) |
| Anticoagulants | 166 | (4.5) | 226 | (6.2) | 207 | (9.7) | 150 | (7.0) |
| <i>Inflammatory, endocrine, metabolic</i> | | | | | | | | |
| Antisteporotics | 258 | (7.0) | 261 | (7.1) | 147 | (6.9) | 143 | (6.7) |
| Intestinal anti-inflammatory agents | 25 | (0.7) | 43 | (1.2) | 21 | (1.0) | 8 | (0.4) |
| Corticosteroids | 258 | (7.0) | 361 | (9.8) | 191 | (8.9) | 204 | (9.5) |
| NSAIDs | 657 | (17.9) | 771 | (21.0) | 347 | (16.3) | 436 | (20.3) |
| Thyroid gland therapeutics | 348 | (9.5) | 376 | (10.2) | 220 | (10.3) | 180 | (8.4) |
| <i>Central nervous system</i> | | | | | | | | |
| Anticonvulsants | 87 | (2.4) | 97 | (2.6) | 140 | (6.6) | 46 | (2.1) |
| Antidepressants | 905 | (24.7) | 508 | (13.8) | 669 | (31.3) | 244 | (11.4) |
| Antipsychotics/neuroleptics | 466 | (12.7) | 253 | (6.9) | 416 | (19.5) | 164 | (7.6) |
| Benzodiazepines | 491 | (13.4) | 481 | (13.1) | 416 | (19.5) | 280 | (13.1) |

n, number; OR, odds ratio; CI, confidence interval; ACE, angiotensin-converting enzyme; AT, angiotensin; NSAIDs, nonsteroidal anti-inflammatory drugs.

Supplementary Table 6
 Exposure prevalence to various drugs in patients the oldest-old (i.e., those aged 85+ years) with Alzheimer's disease or vascular dementia and corresponding dementia-free controls

| Drugs | Alzheimer's disease | | | | Vascular dementia | | | |
|---|----------------------|--------|-------------------------|--------|----------------------|--------|-------------------------|--------|
| | Cases (n = 2,113) | | Controls (n = 2,108) | | Cases (n = 1,704) | | Controls (n = 1,692) | |
| | n | (%) | n | (%) | n | (%) | n | (%) |
| <i>Cardiovascular</i> | | | | | | | | |
| ACE inhibitors | 296 | (14.0) | 457 | (21.7) | 367 | (21.5) | 360 | (21.3) |
| AT-II antagonists | 64 | (3.0) | 148 | (7.0) | 99 | (5.8) | 116 | (6.9) |
| Beta-blockers | 290 | (13.7) | 427 | (20.3) | 336 | (19.7) | 327 | (19.3) |
| Calcium channel blockers | 300 | (14.2) | 451 | (21.4) | 364 | (21.4) | 390 | (23.1) |
| Diuretics | 848 | (40.1) | 1134 | (53.8) | 874 | (51.3) | 899 | (53.1) |
| Vasodilators | 202 | (9.6) | 320 | (15.2) | 324 | (19.0) | 276 | (16.3) |
| Anti-arrhythmics | 34 | (1.6) | 51 | (2.4) | 51 | (3.0) | 55 | (3.3) |
| Oral antidiabetics | 85 | (4.0) | 83 | (3.9) | 108 | (6.3) | 106 | (6.3) |
| Insulin | 17 | (0.8) | 30 | (1.4) | 18 | (1.1) | 18 | (1.1) |
| Statins | 193 | (9.1) | 311 | (14.8) | 309 | (18.1) | 273 | (16.1) |
| Antiplatelets | 152 | (7.2) | 220 | (10.4) | 331 | (19.4) | 174 | (10.3) |
| Anticoagulants | 61 | (2.9) | 122 | (5.8) | 121 | (7.1) | 98 | (5.8) |
| <i>Inflammatory, endocrine, metabolic</i> | | | | | | | | |
| Antihypertotics | 169 | (8.0) | 190 | (9.0) | 135 | (7.9) | 127 | (7.5) |
| Intestinal anti-inflammatory agents | 10 | (0.5) | 14 | (0.7) | 13 | (0.8) | 14 | (0.8) |
| Corticosteroids | 117 | (5.5) | 180 | (8.5) | 133 | (7.8) | 156 | (9.2) |
| NSAIDs | 324 | (15.3) | 339 | (16.1) | 231 | (13.6) | 272 | (16.1) |
| Thyroid gland therapeutics | 219 | (10.4) | 219 | (10.4) | 168 | (9.9) | 168 | (9.9) |
| <i>Central nervous system</i> | | | | | | | | |
| Anticonvulsants | 55 | (2.6) | 56 | (2.7) | 90 | (5.3) | 52 | (3.1) |
| Antidepressants | 474 | (22.4) | 289 | (13.7) | 474 | (27.8) | 235 | (13.9) |
| Antipsychotics/neuroleptics | 332 | (15.7) | 176 | (8.4) | 361 | (21.2) | 163 | (9.6) |
| Benzodiazepines | 378 | (17.9) | 366 | (17.4) | 363 | (21.3) | 278 | (16.4) |

n, number; OR, odds ratio; CI, confidence interval; ACE, angiotensin-converting enzyme; AT, angiotensin; NSAIDs, nonsteroidal anti-inflammatory drugs.