**Supplementary table 1**. Characteristics of cases and controls, overall and restricted to those who donated blood.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Total** | | **HLA data available** | |
|  | **Cases** | **Controls** | **Cases** | **Controls** |
| Women (n, %) | 4923 (74) | 10096 (73) | 4022 (74) | 5520 (76) |
| Men (n, %) | 1771 (26) | 3649 (27) | 1438 (26) | 1755 (24) |
| Swedish origin (n, %) | 5441 (81) | 11086 (81) | 4454 (82) | 5949 (82) |
| BMI at age 20 (kg/mg, SD)  BMI>25 kg/m (n, %) | 22.0 (3.6)  903 (13) | 21.6 (3.0)  1384 (10) | 22.0 (3.5)  719 (13) | 21.6 (3.0)  686 (9.4) |
| A history of IM (n, %) | 1112 (17) | 1260 (9.2) | 877 (16) | 616 (8.5) |
| Ever smoking (n, %) | 3805 (57) | 6821 (50) | 3132 (57) | 3688 (51) |
| Total | 6694 | 13745 | 5460 | 7275 |

**Supplementary table 2.** OR with 95% CI of developing MS for subjects with different combinations of BMI at age 20 years and EBNA-1 antibody levels, stratified by study.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Overall | | | | | |  |
| **BMI at age 20** | **EBNA-1 levels** | **ca/co1** | **OR (95% CI)2** | **OR (95% CI)3** | **AP (95% CI)** | **RERI (95% CI)** |
| <25 | Low | 1004/2264 | 1.0 (reference) | 1.0 (reference) |  |  |
| >25 | Low | 135/237 | 1.3 (1.1-1.7) | 1.4 (1.1-1.8) |  |  |
| <25 | High | 3194/2263 | 3.1 (2.9-3.5) | 2.8 (2.5-3.0) |  |  |
| >25 | High | 487/239 | 4.7 (3.9-5.5) | 4.1 (3.4-4.8) | 0.2 (0.1-0.4) | 0.8 (0.1-1.6) |
| EIMS | | | | | |  |
| **BMI at age 20** | **EBNA-1 levels** | **ca/co1** | **OR (95% CI)2** | **OR (95% CI)3** | **AP (95% CI)** | **RERI (95% CI)** |
| <25 | Low | 328/974 | 1.0 (reference) | 1.0 (reference) |  |  |
| >25 | Low | 65/115 | 1.6 (1.2-2.3) | 1.7 (1.3-2.6) |  |  |
| <25 | High | 1061/910 | 3.5 (3.0-4.1) | 3.0 (2.6-3.5) |  |  |
| >25 | High | 227/115 | 5.6 (4.3-7.2) | 4.7 (3.5-6.0) | 0.2 (0.04-0.4) | 0.8 (0.05-2.0) |
| GEMS | | | | | |  |
| **BMI at age 20** | **EBNA-1 levels** | **ca/co1** | **OR (95% CI)2** | **OR (95% CI)3** | **AP (95% CI)** | **RERI (95% CI)** |
| <25 | Low | 676/1290 | 1.0 (reference) | 1.0 (reference) |  |  |
| >25 | Low | 70/122 | 1.2 (0.9-1.5) | 1.3 (0.9-1.6) |  |  |
| <25 | High | 2133/1353 | 3.0 (2.7-3.4) | 2.5 (2.2-2.8) |  |  |
| >25 | High | 260/124 | 4.0 (3.2-5.1) | 3.6 (2.6-4.2) | 0.2 (0.007-0.4) | 0.7 (0.02-1.6) |

1number of exposed cases and controls; 2adjusted for study, age, sex, residential area, ancestry, and smoking; 3adjusted for study, age, sex, residential area, ancestry, smoking, IM history, A\*02:01 and DRB1\*15:01; AP=attributable proportion due to interaction; RERI= excess risk due to interaction