**Comparison between Type A and Type B Early Adiposity Rebound in predicting overweight and obesity in children: a longitudinal study**

**Running title: Type A and Type B Early Adiposity Rebound**

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**Competing Interests statement**

All authors have read and approved the manuscript. No author has any conflict of interest to declare.

**Table S1**. Characteristics of the Non-EAR group and EAR groups according to the WHO definition

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Non-EAR group** | **EAR group** | ***p*** |
| **Clinical parameters at age 3-5** |  |  |  |
| *n* | 629 | 426 |  |
| Age (years) | 4.4 ± 0.4 | 4.4 ± 0.45 | 0.513 |
| BMI (kg/m²) | 15.3 ± 1.2 | 16.3 ± 1.7 | <0.0001 |
| Catch-up growth |  |  | 0.197 a |
|  No | 302 (59.1) | 247 (63.3) |
|  Yes | 209 (40.9) | 143 (36.7) |
| Body weight status |  |  | <0.0001b |
|  Underweight *n* (%) | 10 (1.6) | 0 (0) |
|  Normal-weight *n* (%) | 611 (97.1) | 378 (88.7) |
|  Overweight *n* (%) | 8 (1.3) | 34 (8.0) |
| Obese *n* (%) | 0 (0) | 14 (3.3) |
| **Clinical parameters at age 6-8** |  |  |  |
| *n* | 513 | 354 |  |
| Sex (% boys) | 54.6 | 46.6 | 0.021 |
| Age (years) | 7.5 ± 0.4 | 7.5 ± 0.4 | 0.641 |
| BMI (kg/m²) | 15.9 ± 1.6 | 17.4 ± 2.9 | <0.0001b |
| Body weight status |  |  |
|  Underweight *n* (%) | 5 (1.0) | 0 (0) |
|  Normal-weight *n* (%) | 430 (83.8) | 214 (60.4) |
|  Overweight *n* (%) | 66 (12.9) | 83 (23.5) |
| Obese *n* (%) | 12 (2.3) | 57 (16.1) |

Data are presented as mean ± standard deviation, or as *n* (%). BMI = body mass index, EAR= early adiposity rebound. Student testfor quantitative variable, a Chi-Squared test or b Fisher exact test for qualitative data analysis, for comparison between Non-EAR and EAR groups.

**Table S2**. Characteristics of the Non-EAR group and EAR groups according to the WHO definition

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Non-EAR** **group (0)** | **TypeA EAR group (1)** | **TypeB EAR group (2)** | ***p*-value** | **Dunn’s test** |
| **1 vs 0** | ***p*-value** **1 vs 2** | **2 vs 0** |
| **Clinical parameters at age 3-5** |  |  |
| n | 629 | 172 | 254 |  |  |  |  |
| Age (years) | 4.4 ± 0.4 | 4.4 ± 0.5 | 4.5 ± 0.4 | 0.302 |  |  |  |
| BMI (kg/m²) | 15.3 ± 1.2 | 17.8 ±1.7 | 15.3 ±0.7 | <0.0001 | \*\*\* | \*\*\* | ns |
| Catch-up growth |  |  |  | 0.0001a |  |  |  |
|  No | 302 (59.1) | 79 (51.0) | 168 (71.5) |  |  |  |
|  Yes | 209 (40.9) | 76 (49.0) | 67 (28.5) |  |  |  |
| Body weight status |  |  |  | <0.0001b |  |  |  |
|  Underweight *n* (%) | 10 (1.6) | 0 (0) | 0 (0) |  |  |  |
|  Normal-weight *n* (%) | 611 (97.1) | 124 (72.1) | 254 (100.0) |  |  |  |
|  Overweight *n* (%) | 8 (1.3) | 34 (19.8) | 0 (0) |  |  |  |
| Obese *n* (%) | 0 (0) | 14 (8.1) | 0 (0) |  |  |  |
| **Clinical parameters at age 6-8** |  |  |
| *n* | 513 | 140 | 214 |  |  |  |  |
| Sex (% boys) | 54.6 | 46.7 | 46.4 | 0.070 |  |  |  |
| Age (years) | 7.5 ± 0.4 | 7.5 ± 0.4 | 7.5 ± 0.4 | 0.476 |  |  |  |
| BMI (kg/m²) | 15.9 ± 1.6 | 19.5 ± 3.1 | 16.0 ± 1.7 | <0.0001 | \*\*\* | \*\*\* | ns |
| Body weight status |  |  |  | <0.0001b |  |  |  |
|  Underweight *n* (%) | 5 (1.0) | 0 (0) | 0 (0) |  |  |  |
|  Normal-weight *n* (%) | 430 (83.8) | 37 (26.4) | 177 (82.7) |  |  |  |
|  Overweight *n* (%) | 66 (12.9) | 51 (36.4) | 32 (15.0) |  |  |  |
| Obese *n* (%) | 12 (2.3) | 52 (37.1) | 5 (2.3) |  |  |  |

Data are presented as mean ± standard deviation, or as *n* (%). BMI = body mass index, EAR= early adiposity rebound. Analysis of variance for quantitative data analysis and a Chi-Squared test or b Fisher exact test for qualitative data analysis for comparison between Non-EAR, T1-EAR and T2-EAR groups. Post-hoc (Scheffe’s test) for comparison between groups; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001.

**Table S3.** Association between risk factors and overweight/obesity at age 6-8 years according to the WHO definition

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Unadjusted Odds-ratio [95%CI]** | ***P* value** | **Final model adjusted odds ratio [95%CI]** | ***P* value** |
| Gestational age (weeks) |  | 0.614 | Did not enter | – |
| <32 | 0.78 [0.21-2.81] |  |  |  |
| 32-36 | 0.69 [0.31-1.52] |  |  |  |
| ≥ 37 | 1 |  |  |  |
| Body mass status at birth |  | 0.029 |  | <0.0001 |
| Eutrophy | 1 |  | 1 |  |
| Macrosomia | 1.90 [1.07-3.37] |  | 5.68 [2.33 - 13.86] |  |
| Hypotrophy  | 0.73 [0.45-1.19] |  | 0.36 [0.16 - 0.83] |  |
| Mother’s smoking status during pregnancy |  | 0.002 |  | 0.0016 |
| Not smoker | 1 |  | 1 |  |
| Smoker | 1.98 [1.28-3.07] |  | 2.73 [1.46 – 5.12] |  |
| Body mass index of the mother |  | <0.0001 |  | 0.0179 |
| <25 kg/m² | 1 |  | 1 |  |
| 25-30 kg/m² | 1.34 [0.89-2.02] |  | 0.87 [0.45-1.68] |  |
| ≥ 30 kg/m² | 3.04 [1.91-4.85] |  | 2.59 [1.28-5.24] |  |
| Body mass index of the father |  | 0.001 |  | 0.0162 |
| <25 kg/m² | 1 |  | 1 |  |
| 25-30 kg/m² | 1.63 [1.15-2.31] |  | 2.14 [1.26-3.63] |  |
| ≥ 30 kg/m² | 2.45 [1.44-4.17] |  | 1.93 [0.83-4.48] |  |
| Gestational diabetes |  | 0.555 | Did not enter | – |
| No  | 1 |  |  |  |
| Yes | 1.22 [0.63-2.38] |  |  |  |
| Hypertension during pregnancy |  | 0.597 | Did not enter | – |
| No  | 1 |  |  |  |
| Yes | 1.24 [0.56-2.73] |  |  |  |
| Breastfeeding |  | 0.035 |  | Not significant |
| No | 1 |  |  |  |
| < 6 months | 0.77 [0.55-1.07] |  |  |  |
| ≥ 6 months | 0.50 [0.29-0.88] |  |  |  |
| Catch-up growth |  | <0.0001 |  |  |
| No | 1 |  |  | Not significant |
| Yes | 2.40 [1.71-3.36] |  |  |  |
| Early adiposity rebound |  | <0.0001 |  | <0.0001 |
| No | 1 |  | 1 |  |
| Yes | 3.65 [2.65-5.03] |  | 3.39 [1.94-5.92] |  |
| Type of rebound |  | <0.0001 |  | <0.0001 |
| No early adiposity rebound | 1 |  | 1 |  |
| Type A early adiposity rebound | 15.53 [9.9-24.26] |  | 13.96 [7.45-26.18] |  |
| Type B early adiposity rebound | 1.167 [0.76-1.79] |  | 3.39 [1.94-5.92] |  |

c-index = 0.831, Hosmer et lemeshow = 0.6905