Table 1: Socio-demographic characteristics of the study population (KUNO Kids study)

Socio-demographic factors, obstetrical features and environmental exposures of children and mothers from the whole study population and the study population with entirely available questionnaires are shown

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Total study population  % or  mean ± SD | | Study sample with infant FA data  % or  mean ± SD | |
| Infant |  | n |  | n |
| Male sex | 51.2 | 2653 | 49.9 | 1134 |
| Mean duration of pregnancy in weeks | 39.5 ± 1.6 | 2625 | 39.6 ± 1.6\* | 1128 |
| Caesarean section | 28.6 | 2679 | 27.8 | 1139 |
| Birth weight (in g) | 3359 ± 509 | 2638 | 3371 ± 500 | 1130 |
| Antibiotic use | 2.7 | 2600 | 2.2 | 1113 |
| Older siblings | 43.7 | 2636 | 38.5\* | 1130 |
| Migration background | 28.0 | 1824 | 14.2\* | 1065 |
| Mother |  |  |  |  |
| Age (years) | 32.7 ± 4.5 | 2651 | 33.1 ± 4.1\* | 1132 |
| Pre-pregnancy BMI (in kg/m2) | 23.8 ± 5.0 | 2614 | 23.7 ± 4.7 | 1121 |
| Regular animal contact | 54.9 | 2601 | 53.8 | 1116 |
| Higher educational level (>10 years) | 56.5 | 2597 | 62.8\* | 1116 |
| Smokers in the household | 22.4 | 2601 | 17.0\* | 1114 |

sd - standard deviation, BMI - body mass index

\*level of significance p < 0.001

Table 2a: Univariate logistic regression analysis in KUNO Kids **at age 1** of potential risk factors concerning (a) the index child and (b) the mother and 1st degree relatives (b): outcome parent-reported symptoms of FA

(a) index child

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Odds ratio (95 % CI)** | **p value** | **n** |
| Male sex | 0.967 (0.721-1.296) | .822 | 1124 |
| Preterm birth | 0.755 (0.378-1.508) | .426 | 1118 |
| Caesarean section | 0.792 (0.565-1.111) | .177 | 1129 |
| Birth weight < 2800 g | 0.736 (0.450-1.203) | .222 | 1120 |
| Duration of breastfeeding < 6 month | 1.159 (0.843-1.610) | .379 | 952 |
| Introduction of solid food at the age of |  |  |  |
| - < 4 month | 1.459 (0.383-5.565) | .580 | 898 |
| - 4 – 6 month | *reference* | |
| - > 6 month | 0.883 (0.538-1.448) | .621 |
| Antibiotic use | 1.084 (0.673-1.745) | .740 | 1127 |
| Daily animal contacts | 1.153 (0.859-1.547) | .342 | 1128 |
| Being on a farm regularly | 1.125 (0.720-1.757) | .606 | 1129 |
| Regular contact to hay | 0.827 (0.436-1.567) | .560 | 1129 |
| High exposure to traffic, exhaust gases | 1.108 (0.824-1.489) | .496 | 1128 |
| Other atopic disease† | 3.594 (2.571-5.025) | <.001 | 1128 |
| Older siblings | 0.857 (0.631-1.163) | .322 | 1120 |
| Migration background | 1.201 (0.792-1.820) | .389 | 1055 |

† atopic eczema, allergic rhinitis, allergic conjunctivitis and asthma

(b) mother and 1st degree relatives

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Odds ratio (95 % CI)** | **p value** | **n** |
| Maternal age > 34 years | 0.871 (0.641-1.185) | .379 | 1122 |
| Pre-pregnancy BMI |  |  | 1111 |
| - underweight | 1.953 (0.787-4.848) | .149 |
| - normal weight | *reference* | |
| - overweight | 1.137 (0.798-1.619) | .478 |
| - obese | 1.518 (0.983-2.344) | .060 |
| Gestational Diabetes | 1.326 (0.897-1.960) | .157 | 1096 |
| Cigarette smoking |  |  |  |
| - during pregnancy | 1.114 (0.786-1.578) | .545 | 1128 |
| - passive exposure | 1.102 (0.305-3.986) | .882 | 1098 |
| Antibiotic use |  |  |  |
| - during pregnancy | 1.068 (0.746-1.528) | .721 | 1113 |
| - during delivery | 0.836 (0.623-1.123) | .235 | 1108 |
| - while breastfeeding | 1.280 (0.784-2.090) | .323 | 939 |
| Being on a farm regularly |  |  |  |
| - during pregnancy | 1.322 (0.738-2.369) | .348 | 1118 |
| - while breastfeeding | 1.417 (0.773-2.596) | .259 | 1116 |
| Regular animal contacts | 1.165 (0.865-1.568) | .316 | 1106 |
| School education |  |  |  |
| - low (no degree) | 1.441 (0.801-2.592) | .222 | 1106 |
| - intermediate (< 10 years) | *reference* | |
| - high (> 10 years) | 1.131 (0.810-1.579) | .470 |
| Atopic disease† of 1st degree relatives‡ | 1.665 (1.186-2.338) | .003 | 1129 |

† atopic eczema, allergic rhinitis, allergic conjunctivitis, asthma and food allergy

‡ parents and blood-related siblings

Table 2b: Univariate logistic regression analysis in KUNO Kids **at age 2** of potential risk factors concerning (a) the index child and (b) the mother and 1st degree relatives (b): outcome parent-reported symptoms of FA

(a) index child

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Odds ratio (95 % CI)** | **p value** | **n** |
| Male sex | 1.032 (0.661-1.611) | .891 | 644 |
| Preterm birth | 0.578 (0.173-1.933) | .374 | 641 |
| Caesarean section | 0.924 (0.559-1.527) | .758 | 646 |
| Birth weight < 2800 g | 0.337 (0.120-0.947) | .039 | 642 |
| Duration of breastfeeding < 6 month | 1.476 (0.905-2.409) | .119 | 533 |
| Introduction of solid food at the age of |  |  |  |
| - < 4 month | -/- (no cases with FA) | -/- | 511 |
| - 4 – 6 month | *reference* | |
| - > 6 month | 0.715 (0.312-1.639) | .715 |
| Antibiotic use | 0.834 (0.384-1.811) | .647 | 644 |
| Daily animal contacts | 2.068 (1.298-3.294) | .002 | 645 |
| Being on a farm regularly | 0.702 (0.338-1.456) | .342 | 646 |
| Regular contact to hay | 0.634 (0.221-1.821) | .397 | 646 |
| High exposure to traffic, exhaust gases | 1.545 (0.988-2.415) | .056 | 645 |
| Other atopic disease† | 2.666 (1.599-4.444) | <.001 | 646 |
| Older siblings | 0.920 (0.578-1.464) | .724 | 642 |
| Migration background | 1.410 (0.777-2.557) | .258 | 624 |

† atopic eczema, allergic rhinitis, allergic conjunctivitis and asthma

(b) mother and 1st degree relatives

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Odds ratio (95 % CI)** | **p value** | **n** |
| Maternal age > 34 years | 0.924 (0.576-1.482) | .924 | 641 |
| Pre-pregnancy BMI |  |  | 640 |
| - underweight | -/- (no cases with FA) | -/- |
| - normal weight | *reference* | |
| - overweight | 1.272 (0.757-2.138) | .363 |
| - obese | 1.333 (0.700-2.541) | .382 |
| Gestational Diabetes | 0.639 (0.319-1.283) |  | 626 |
| Cigarette smoking |  |  |  |
| - during pregnancy | 2.522 (0.482-13.209) | .273 | 628 |
| - passive exposure | 1.979 (1.229-3.186) | .005 | 645 |
| Antibiotic use |  |  |  |
| - during pregnancy | 1.152 (0.684-1.941) | .595 | 639 |
| - during delivery | 0.880 (0.562-1.379) | .577 | 634 |
| - while breastfeeding | 0.853 (0.371-1.964) | .709 | 525 |
| Being on a farm regularly |  |  |  |
| - during pregnancy | 0.684 (0.237-1.974) | .483 | 640 |
| - while breastfeeding | 0.717 (0.248-2.072) | .539 | 641 |
| Regular animal contacts | 1.734 (1.085-2.770) | .021 | 643 |
| School education |  |  |  |
| - low (no degree) | 2.088 (0.939-4.645) | .071 | 634 |
| - intermediate (< 10 years) | *reference* | |
| - high (> 10 years) | 1.047 (0.624-1.755) | .863 |
| Atopic disease† of 1st degree relatives‡ | 1.456 (0.872-2.430) | .151 | 646 |

† atopic eczema, allergic rhinitis, allergic conjunctivitis, asthma and food allergy

‡ parents and blood-related siblings

Table 3: Comparison of KUNO Kids, SPATZ and EuroPrevall study results.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Feature of FA** | **KUNO Kids**  % or mean ± SD | **SPATZ**  % or mean ± SD | **EuroPrevall Germany**  % or mean ± SD | **EuroPrevall total (Europe)**  % or mean ± SD |
| Study sample | 1139 | 1006 | 1570 | 12049 |
| Symptom-based FA |  |  |  |  |
| 6 months | 14.2 | - | - | - |
| 12 months | 13.2 | - | - | - |
| 24 months | 13.9 | - | 14.5$ | 16.0 |
| Doctor’s diagnosed FA |  |  |  |  |
| 6 months | 1.9 |  | - | - |
| 12 months | 2.4 | 2.3 | - | - |
| 24 months | 2.7 | 3.0 | 2.0§ | 3.8§ |
| Male sex | 49.9 | 52.1 | 51.7 | 51.4 |
| Duration of pregnancy (wk) | 39.6 ± 1.6 | 38.8 ± 1.7 | - | 39.6 ± 1,5 |
| Caesarean section (% ?) | 27.8 | 27.9 | 31.1 | 24.0 |
| Birth weight (g) | 3371 ± 500 | 3157 ± 948.3 | - | 3404 ± 512 |
| Pets |  |  |  |  |
| Dog | 9.9 | - | 9.0 | 16.0 |
| Cat | 19.4 | - | 15.0 | 15.1 |
| Other | 9.4 | - | 15.1 | 12.2 |
| Maternal age (yr) | 33.1 ± 4.1 | 32.7 ± 4.7 | 31.4 ± 5.4 | 30.7 ± 5.2 |
| Pre-pregnancy BMI (kg/m2) | 23.7 ± 4.7 | 24.8 ± 5.1 | - | 23.3 ± 4.3 |
| Maternal antibiotic intake |  |  |  |  |
| During pregnancy | 21.0 ‡ | 11.1 ‡ | 18.6 | 21.1 |
| During delivery | 54.3 ‡ | - | 32,4 | 15.4 |
| Cigarette smoking during pregnancy |  |  |  |  |
| Active | 1.3 | - | 10.8 | 10.6 |
| Passive | 21.7 | - | 34.7 | 17.4 |
| Maternal FA | 27.1 | - | 30.2 | 14.3 |
| Other maternal atopic disease† | 31.5 | 34.1 | 35.2 | 26.2 |
| Paternal FA | 24.2 | - | 19.0 | 8.6 |
| Other paternal atopic disease† | 32.9 | 35.4 | 29.2 | 20.9 |
| Other atopic disease of siblings† | 17.1 | 15.9 | 19.9 | 26.0 |

† Atopic eczema, allergic rhinitis, allergic conjunctivitis or asthma

‡ different methods: KUNO kids used a specific question („Did you take any antibiotics during pregnancy/delivery?“), SPATZ used an open question after delivery about any medication intake during pregnancy

$ EuroPrevall documented this frequency for self-reported FA ever in siblings of their study children (25864712)

§ calculated from reference Schoemaker as percentage of children eligible for DBPCFC,

s.d. standard deviation

BMI body mass index