**Literatur A. Juul (suche bei pubmed juul a puberty)**

* (Busch et al. 2017): Genetic variation of FSH action is associated with male pubertal timing. BMI is negatively associated with pubertal timing. Cohort: Danish healthy children and adolescents, 2006-14, 1554 boys. AND:
* Genetic variations altering FSH action affect circulating hormone levels as well as follicle growth in healthy peripubertal girls.
* Pubertal development in healthy children is mirrored by DNA methylation patterns in peripheral blood🡪 longitudinal study describing individual changes in specific epigenetic profiles associated with pubertal onset.
* The Copenhagen Puberty Study: is a combined cross sectional and longitudinal study of healthy Danish children. 209 healthy Danish children (108 girls), were examined and blood samples were drawn every 6 months.
* BMI percentile-for-age overestimates adiposity in early compared with late maturing pubertal children: reproductive hormone levels were not different in those with overweight/obesity compared with the rest of the cohort. Question: is BMI appropriate (it seems to overestimate adiposity in pubertal timing, and BMI does not necessarily reflect body fat,) or is BIA-BF(Measuring body fat percentage) better?(Sørensen und Juul 2015)
* Pubertal development in Danish children: comparison of recent European and US data.: Pubertal development ~ BMI (Juul et al. 2006)!!
* The pubertal transition in 179 healthy Danish children: associations between pubarche, adrenarche, gonadarche, and body composition: No associations with age at pubertal onset and body composition were found in either of the sexes.
* Trends in puberty timing in humans and environmental modifiers (Toppari und Juul 2010)
* Age at puberty and the emerging obesity epidemic: he heavier both boys and girls were at age seven, the earlier they entered puberty. Irrespective of level of BMI at age seven, there was a downward trend in the age at attaining puberty in both boys and girls, which suggests that the obesity epidemic is not solely responsible for the trend. (Aksglaede et al. 2009)
* Recent changes in pubertal timing in healthy Danish boys: associations with body mass index: Estimated mean age at onset of puberty has declined significantly during the recent 15 yr. This decline was associated with the coincident increase in BMI. (Sørensen et al. 2010)

#### :

Kratzsch fragen:

* Juul macht es so bzgl der samples:
* All nonfasting blood samples from Danish boys were drawn between 8:00 am and 2:00 pm from an antecubital vein, then clotted and centrifuged; serum was stored at −20°C until hormone analyses were performed. Serum levels of FSH and luteinizing hormone (LH) were measured by time-resolved immunofluorometric assays (Delfia; PerkinElmer, Boston, MA) with detection limits of 0.06 and 0.05 IU/L, respectively. Intra- and interassay coefficients of variation were <5%.
* Total serum estradiol was measured by a RIA (Pantex Corp., Immunodiagnostic Systems Limited, Santa Monica, CA, USA) with a detection limit of 18 pmol/l. Serum AMH levels were determined using the Beckman Coulter enzyme immunometric assay generation I (Immunotech, Beckman Coulter Ltd., USA) with a detection limit of 2.0 pmol/L.

Überlegungen zu Statistik

* BMI-Unterschied zwischen den Kohorten?🡪 student t test (Busch et al. 2017)
* Individual BMI z scores stable throughout puberty? 🡪 sample t-test comparing mean pre- and postpubertal individual BMI z scores (interval-censored data only) (Busch et al. 2017)
* Effect of BMI z score on age at pubertal onset 🡪 adjusted the probit analysis for BMI z score as a continuous variable (Busch et al. 2017), und: To estimate effect of the genetic variants as well as BMI z score on age at pubertal onset, we compared the results from two models. In the first model, we estimated the variance in the age at pubertal onset in a probit analysis in which genotypes or BMI z score was included as an explanatory variable. In the second model, we estimated the variance in a probit analysis in which no explanatory variable was included. The difference between the two variances is due to the genetic variants or BMI z score included in the model. P ≤ 0.05 was considered statistically significant.
* To evaluate the effect BMI/Sozstat on serum gonadotropin levels: maybe Mann Whitney U tests?
* Differences between early and late maturers were done by Student's t-tests within each age and pubertal group. Adjusted analyses were done by general linear models (ANOVA). Differences in prevalence of overweight and obesity were evaluated by Fisher's exact tests**.** **(Sørensen und Juul 2015)**
* Studie: (Juul et al. 2006) angucken: Pubertät~BMI

Literaturverzeichnis

Aksglaede, Lise; Juul, Anders; Olsen, Lina W.; Sørensen, Thorkild I. A. (2009): Age at puberty and the emerging obesity epidemic. In: *PLoS ONE* 4 (12), e8450.

Busch, Alexander S.; Hagen, Casper P.; Main, Katharina M.; Pereira, Anita; Corvalan, Camila; Almstrup, Kristian et al. (2017): Genetic Variation of Follicle-Stimulating Hormone Action Is Associated With Age at Testicular Growth in Boys. In: *The Journal of clinical endocrinology and metabolism* 102 (5), S. 1740–1749. DOI: 10.1210/jc.2016-4013.

Juul, Anders; Teilmann, Greta; Scheike, T.; Hertel, N. T.; Holm, K.; Laursen, E. M. et al. (2006): Pubertal development in Danish children. Comparison of recent European and US data. In: *International journal of andrology* 29 (1), S. 247–255.

Sørensen, Kaspar; Aksglaede, Lise; Petersen, Jørgen Holm; Juul, Anders (2010): Recent changes in pubertal timing in healthy Danish boys. Associations with body mass index. In: *The Journal of Clinical Endocrinology & Metabolism* 95 (1), S. 263–270.

Sørensen, Kaspar; Juul, Anders (2015): BMI percentile-for-age overestimates adiposity in early compared with late maturing pubertal children. In: *European Journal of Endocrinology* 173 (2), S. 227–235.

Toppari, Jorma; Juul, Anders (2010): Trends in puberty timing in humans and environmental modifiers. In: *Molecular and cellular endocrinology* 324 (1), S. 39–44.