# Young girls with Anorexia Nervosa have low estradiol levels, independently from duration of amenorrhea

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## Background

Anorexia Nervosa (AN) is a primary psychiatric disease, complicated by serious endocrine disturbances. Hypogonadotropic hypogonadism with primary or secondary amenorrhea is the most common endocrine repercussion of AN, with consequent low estradiol (E2) levels and concerns about bone mineral density. Furthermore, establishing regular menstrual cycles is considered as an important milestone for women treated for AN.

## Objective and hypothesis

To evaluate E2 levels in young girls with AN and secondary amenorrhea and quantify the severity of E2 deficiency.

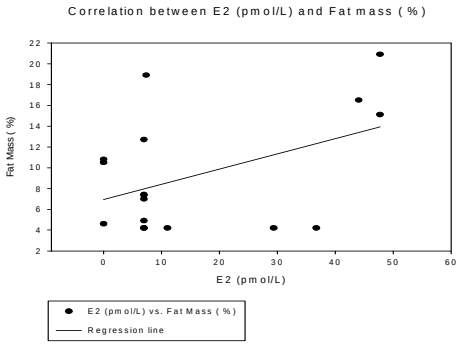
## Methods

17 young girls with diagnosis of AN (mean age 15 ± 1.6 years, range 12-18.31), and secondary amenorrhea (mean duration 8.6 ± 5.53 months, 3-24) were compared with 10 age-matched girls with diagnosis of hypothalamic amenorrhea (HA) not related to a low nutritional status and from 10 age-matched healthy controls. A complete anthropometric and biochemical evaluation was carried out.
Body composition (percentage of fat tissue) and Bone Mineral Density (BMD) for Lumbar Spinal and Total Body were evaluated by Dual Energy X-ray Absorptiometry (DEXA) (Prodigy Advance GE Lunar). Results were expressed as g/m$^2$ and Z-score according to sex and age. According to OMS definition, osteopenia was defined by Z-score BMD <-1 and >-2.5 and osteoporosis was defined by Z-score BMD ≤-2.5.
Plasma Total E2 was measured with a sensitive direct radioimmunoassay (RIA, Orion Diagnostica device Spectria, Espoo, Finland) with a MDC of 2 pg/ml (7.3 pmol/l).

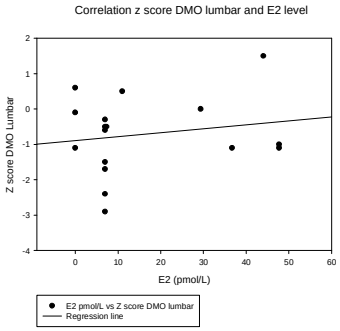
## Results

Mean E2 levels in AN patients were severely reduced: 25.44 ± 24.2 vs 90.3 ± 83 and 160 ± 92 pmol/L in HA and controls ($p<0.05$ and $p< 0.001$, respectively). E2 levels were significantly correlated with % of fat mass ($p < 0.001$) (Figure A). One girl had osteoporosis and 6 girls had osteopenia. No correlation was found between E2 levels and duration of amenorrhea and with bone mineral density parameters (Figure B).

A




B




## Conclusions

Young girls with AN and secondary amenorrhea present low levels of E2, independently from the duration of amenorrhea. Further studies are need to evaluate the impact of such low estrogen deficiency on the general health status.

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**Disclosure statement**
none of the authors have conflict of interest to declare.