CORRELATION BETWEEN DHEA-S LEVELS AND MARKERS OF BONE TURNOVER IN HYPOTHALAMIC AMENORRHEA

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OBJECTIVES

It is known that functional hypothalamic amenorrhea is associated with low bone turnover due to low gonadal homone levels. Estrogens are critical for activation of bone remodelling units, suppression of bone reabsorption, increase of 1-25(OH)Vitamin D receptors expression. Other mechanisms could be operative, including improper diet and unbalanced exercise; however the physiopathology of such a condition is not entirely known. In order to evaluate the correlation between pituitary, gonadal and adrenal hormones with markers of bone metabolism, we have studied a group of 21 female patients with a history of secondary amenorrhea, lasting at least six months.

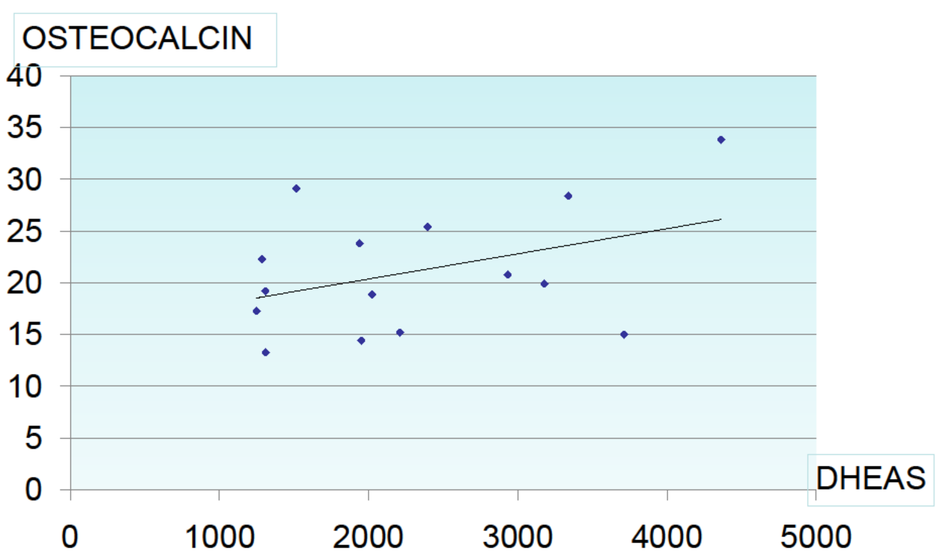
METHODS

They were aged 19-35 ys, with a BMI range 17.5-19.5 kg/mq. Bone mineral density (BMD) was determined by DXA scan at lumbar spine and neck of the right hip femur. The following parameters were evaluated in a blood morning sample: FSH, LH, estradiol, ACTH, DHEAS, osteocalcin, bone alkaline phosphatase, beta-cross laps, Vitamin D and PTH. Hormones were assayed by CMIA or CLIA method; osteocalcin and beta-crosslaps by electrochemiluminesce.

Table 1

	Mean ± SEM	NORMAL RANGE
FSH	5,38 ± 0,34	2,5 - 11 mU/ml
LH	2,24 ± 0,49	2,5 - 15 mU/ml
Estradiolo	26,16 ± 4,9	21 - 251 pg/ml
ACTH	17,42 ± 1,75	10 - 55 pg/ml
DHEAS	2460 ± 232	800 – 3500 ng/ml
Osteocalcin	20,82 ± 1,81	10 – 45 ng/ml
Bone Alkaline Phosphatase	0,32 ± 0.02	5.5 – 25 µg/L
Beta Cross Laps	0,54 ± 0.04	0,2 – 1 ng/ml
Vitamin D	28,80 ± 1,56	31 - 100 ng/ml
PTH	33,32 ± 4	10 - 65 pg/ml

Fig.1



RESULTS

DXA evaluation showed a significant reduction in BMD (osteopenia or osteoporosis) in 8 patients (T score at lumbar spine from -1.1 to -2.9). Mean ± SEM hormone values are reported in table 1. Mean 25(OH)-Vitamin D were 28.8±1.56 ng/ml (with 13 patients with values in the range of Vitamina D deficiency); DHEAS, on the contrary, were in the normal range (2460.4±232 ng/ml) and showed a significant direct correlation with osteocalcin ($p<0.05$) (Fig. 1).

CONCLUSIONS

These preliminary data suggest that, in presence of low estradiol levels, the main regulation of bone formation could be represented by DHEAS. Further studies can show the possible therapeutic implication of these data.

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