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GLOBAL DNA METHYLATION AS A POSSIBLE MECHANISM FOR THE EFFECT OF VITAMIN D IN BONE HEALTH

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Objective: The aim of this study was to determine the relationship between inter-individual global DNA methylation and vitamin D levels in postmenopausal women with osteoporosis.

Material and methods: The 5-methyl cytosine content was assessed by reverse phase high pressure liquid chromatography (RP-HPLC) of peripheral blood leukocytes obtained from postmenopausal women to determine individual global DNA methylation status (Cm%). Dual X-ray absorptiometry (DXA) densitometer (Lunar 7164) were used to assess BMD of three bone sites (total hip, femoral-neck, and spinal lumbar vertebrae (L2-L4)). Each person was categorized based on The WHO osteoporosis criteria; osteoporosis (T score \leq -2.5), osteopenia (-2.5 < T score < -1) and normal (T score \geq -1) in at least one region. Vitamin D levels were measured using electrochemiluminescence assay. The serum vitamin D levels lower than 30ng/ml were defined as vitamin D deficiency or insufficiency.

Results: A total of 150 postmenopausal women (40 persons with osteoporosis, 40 persons with osteopenia, and 70 persons) - who had not any chronic disorders- were recruited in this study. There was a negative significant correlation between DNA methylation levels and vitamin D levels ($r=-0.20$, $p=0.01$) without any association with age ($p=0.3$). There was significantly higher levels of DNA methylation in subjects with vitamin D deficiency (5.32 ± 0.58 vs. 3.98 ± 0.17 , respectively, $p=0.01$). In women with vitamin D deficiency, there was significant negative relationship between DNA methylation levels and T-score and BMD value of spinal lumbar region (L2-L4) ($p=0.012$, $r=-0.38$).

Conclusion: The findings of this study suggest that vitamin D levels could influence bone status through epigenetic mechanisms specially DNA methylation. So that, global DNA hyper-methylation was associated with lumbar bone loss in patient with vitamin D deficiency.

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THE IMPACT OF UNILATERAL ADRENALECTOMY ON BONE STATUS ON MENOPAUSAL WOMEN DIAGNOSED WITH NON-SECRETOR ADRENAL TUMORS: A LONGITUDINAL STUDY

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Introduction: Non-secretor adrenal tumors may cause bone mineral density (BMD) loss because of longtime exposure to mild persistent cortisol secretion which is found in more than one third of cases.

Aim: To analyze the bone profile of menopausal women diagnosed with an adrenal incidentaloma (AI) to whom adrenalectomy was performed or not.

Material and Method: The bone features are provided. The entire panel of endocrine adrenal profile excluded a typically secretor tumor confirming the diagnosis of an AI. This is a longitudinal retrospective study in a single tertiary centre of endocrinology from East Europe. The data were collected from 2010 to 2016. The patient agreed to anonymously use their medical records at admission. The patients who suffered unilateral adrenalectomy were referred to a surgical center where laparoscopic procedure was done. The indication of surgery was based on increased size of the tumor during follow-up. Central dual-energy x-ray absorptiometry was performed with a GE Lunar Prodigy machine.

Results: A total of 44 women were enrolled. The mean period of time for follow-up was 24 months. The two groups were similar as age of diagnosis (61 years) and there was not statistical significant difference between the levels of plasma morning cortisol (at baseline and after low dose of dexamethasone inhibition test) and ACTH (adrenocorticotrophic hormone) at baseline between first and the second group. Group 1 (patient who were followed without surgery) included 35 patients. Initial lumbar BMD was of 1.039 g/cm^2 , at after 2 years was of 0.89 g/cm^2 ($p<0.0005$). Group 2 included 9 patients who suffered a tumor remove and BMD increased to 1.137 g/cm^2 from 1.0004 g/cm^2 after 24 months ($p=0.003$). As limits of the study we mention that 5 patients from group 1 and 2 from group 2 were offered anti-osteoporotic specific drugs in addition to vitamin D supplements which might influence the interpretation of data.

Conclusion: The bone profile becomes a key-player in menopausal population diagnosed with AI related to adequate management during follow-up.