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Abstracts of the ECTS Congress 2019

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gestation, placental weight and serum vitamin D levels at baseline and post delivery. Newborn parameters included birth weight, length, head circumference; cord blood vitamin D & IGF-1 levels and bone mass assessment by DXA (Hologic Discovery A) within 15 days after birth. Association was sought between bone mass parameters and newborn and maternal factors using one way ANOVA and linear regression.

Results: The study population included 150 term & AGA newborns from mothers with mean age at recruitment of 26.7 ± 3.4 years, mean gestational age 14 ± 1 weeks at recruitment. The bone mass was: BMC 44.94 ± 7.3 g, BMD 0.25 ± 0.21 g/cm^2 (median 0.21, 0.15–1.38) and bone area 218.6 ± 20 cm^2. The mean placental weight was 506.9 ± 77.4gm (n = 60) and mean femoral volume as assessed by 3D ultrasound was 0.77 ± 0.29 ml at 19 weeks and 4.49 ± 1.28 ml at 34 weeks (n = 30). The mean birth weight, birth length and head circumference was 2991.3 ± 403.5gm, 50.7 ± 2.2 cm and 34 ± 1.3 respectively. New born BMC, BMD and bone area were significantly associated with placental weight, newborn birth weight, birth length & head circumference (all p < 0.001) however newborn IGF -1 was also significantly associated with newborn BMC and bone area (p < 0.05). None of the newborn bone mass parameter significantly correlated with maternal dietary intake and maternal or newborn vitamin D status.

Conclusions: Placental weight and newborn IGF-1, birth weight, birth length & head circumference could be the probable factors associated with new born bone mass.

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Normocalcaemic hypoparathyroidism: study of the prevalence and natural history in a United Kingdom referral population

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Introduction: Normocalcaemic hypoparathyroidism (NHYPO) is characterised by persistently low levels of parathyroid hormone (PTH) with normal levels of calcium. There is little in current literature on this disease, with only two studies published on its prevalence whilst its natural history remains relatively unknown.
Objectives: To identify the prevalence of NHYPO in a UK referral population and to study the natural history of the disorder.
Methodology: We retrospectively evaluated data from 6280 patients that had been referred for a bone mineral density measurement and a laboratory evaluation between 2013 and 2017. Mahalanobis distance was used to identify subjects as 'normal' or 'abnormal' and the reference intervals for adjusted calcium and PTH were used to divide these patients in different categories. A random group from the normal population was used as a control.
Results: Based on lab results on the index day, 22 patients (0.35%) were identified as having NHYPO. Four patients were excluded (cancer/chemotherapy or unconfirmed data), thus the final number of NHYPO patients was 18 (prevalence 0.29%). When studying the natural history, only 56% of the included patients had persistent normal levels of adjusted calcium throughout their follow up period
Conclusions: Previous estimates of the prevalence have been higher, between 1.1 and 2.4%.This is the largest study to date to study NHYPO, including the longest follow up period (10 years). The next steps are to find out the cause of this biochemical abnormality and the consequences, if any.
Keywords: Normocalcaemic, Normocalcemic, Hypoparathyroidism

P146

Aggravation of trabecular bone defect in ovariectomized Goto-Kakizaki (GK) type-2 diabetic rats

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Estrogen deprivation has known to increase bone turnover in postmenopausal women, in part, by enhancing osteoclastic bone resorption. Type 2 diabetes (T2DM), which has high prevalence in postmenopausal women, also deteriorates bone microstructure; however, whether a combination of T2DM and estrogen deficiency can aggravate impairment of bone microstructure and bone growth has been elusive. We, therefore, investigate the relative contribution of estrogen deficiency and T2DM on bone growth and microstructure in non-obese Goto-Kakizaki (GK) T2DM rats compared with wild-type (WT) Wistar rats, some of them (9 months old) were subjected to ovariectomy (OVX) to induce estrogen deficiency or sham operation. This study has been approved by the institutional ethics committee. Rats were divided in 4 groups, i.e., WT/Sham, GK/Sham, WT/OVX, and GK/OVX. Four months after surgery, femoral and tibial lengths were determined. Cortical and trabecular bone mineral density (BMD) were measured by μ-CT. Bone histomorphometric analysis found that estrogen deprivation and T2DM did not affect longitudinal bone growth. Estrogen deficiency induced bone loss in both trabecular and cortical regions. Similar results were observed in GK/Sham as compared to WT/Sham. However, the combined T2DM and estrogen deficiency caused further loss of trabecular BMD. Bone histomorphometry showed significant bone loss in GK/Sham as indicated by the decreased trabecular thickness and number as well as an increase in trabecular separation (P < 0.001). In addition, trabecular number of WT/OVX and GK/OVX rats decreased, and trabecular separation further increased as compared with their respective control groups. In conclusion, the combination of T2DM and estrogen deprivation markedly disturbed bone turnover rather than longitudinal bone growth. The combined condition showed more bone deterioration than each condition alone. Thus, an early prevention of prediabetic condition is expected to benefit postmenopausal women.
Keywords: Bone mineral density; bone turnover; type 2 diabetes mellitus; estrogen deficiency; Goto-Kakizaki rats

P147

A reduced lactose yogurt containing galactooligosaccharides (GOS) as a tool for lactose intolerant cover calcium daily intake that ensures bone health

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The galactooligosaccharides (GOS), natural prebiotics of human milk could be incorporated in dairy products, such as yogurt, by enzymatic action on milk lactose. We previously demonstrated: 1st. functional characteristics of such reduced-lactose yogurt containing GOS during the experimental normal growth; 2nd. Ca absorption (CaAbs) was similar to that observed by feeding the recommended rodent diet.

Objective: To evaluate the beneficial effects of this reduced-lactose yogurt containing GOS in body composition and bone retention during normal growth. Male weaning Wistar rats (n = 10 per group) received during 30 days AIN´93-G control diet (CD) or the yogurt containing GOS diet (ED). Food consumption was evaluated three times per week; body weight (BW) weekly; Ca and phosphorus (P) Abs during the last 3 days of the experience; femur Ca and P content, total skeleton bone mineral content (BMC) and bone mineral density (BMD) at the end of the study. Body composition and BMD of lumbar spine (LS), total (TT) and proximal (PrT) tibia BMD, and TT BMC were also evaluated.

Result (mean ± SD): Food consumption; BW; body fat and lean tissue percentages were similar in both groups. BMC (1.29 ± 0.14 vs. 1.32 ± 0.24 g), BMD (0.320 ± 0.010 vs. 0.320 ± 0.005 g/cm^2), TT BMD (0.246 ± 0.022 vs. 0.246 ± 0.018 g/cm^2) and BMC (0.029 ± 0.004 vs. 0.030 ± 0.014 g); LS BMD (0.250 ± 0.017 vs. 0.251 ± 0.019 g/cm^2) and Ca and P content in femur showed no significant differences. CaAbs % (84.9 ± 2.2 vs. $80.0 \pm 5.4\%$; p = 0.062) and PAbs % (86.6 ± 6.6 vs. $78.0 \pm 7.1\%$; $p < 0.05$); PrT BMD (0.303 ± 0.056 g/cm^2 vs. 0.266 ± 0.018; $p < 0.05$) were higher in ED vs. CD. The results evidenced similar body composition, higher Ca and P Abs and similar bone mass and retention.

Conclusion: These results may suggest that the reduced lactose milk funcional product assayed here appears to an optimal tool for maintaining an adequate intake of Ca, which prevents secondary bone disease caused by a milk-restricted diet.
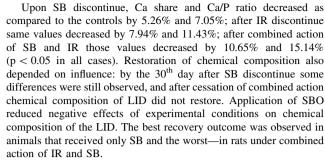
P148

The effects of 60-day sodium benzoate intake and ionizing radiation on chemical composition of the lower incisor dentin in rats

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The study is aimed at investigation of macroelemental composition of the lower incisor dentin (LID) in rats in readaptation period after 60-day application of sodium benzoate (SB) and exposure to ionizing radiation (IR), and finding possibility of medication with sea buckthorn oil (SBO).

The experiment involved 240 rats with body weight of 180–200 g. The animals were distributed into 8 groups as follows: intact animals, animals that received *per os* SB in dosage of 1500 mg/kg daily for 60 days, animals exposed to IR (total 4 Grey in 4 sessions), received SBO in dosage of 300 mg/kg, combined SB and IR, SB and SBO, IR and SBO, and all three agents simultaneously. The animals were withdrawn from the experiment by means of anaesthetized decapitation. Dentin taken from lower incisor was prepared for chemical analysis.

Upon SB discontinue, Ca share and Ca/P ratio decreased as compared to the controls by 5.26% and 7.05%; after IR discontinue same values decreased by 7.94% and 11.43%; after combined action of SB and IR those values decreased by 10.65% and 15.14% ($p < 0.05$ in all cases). Restoration of chemical composition also depended on influence: by the 30th day after SB discontinue some differences were still observed, and after cessation of combined action chemical composition of LID did not restore. Application of SBO reduced negative effects of experimental conditions on chemical composition of the LID. The best recovery outcome was observed in animals that received only SB and the worst—in rats under combined action of IR and SB.

Thus, 60-day application of SB in dosage of 1500 mg/kg, exposure to IR and combined action result in destabilization of chemical composition of LID that expands even to readaptation period and SBO is an adequate correction drug.

Keywords: Rats, lower incisor, dentin, macroelemental composition

P149

Macroelemental composition of bones in rats of various ages after excessive palm oil intake and administration of Garciniae cambogia extract

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The aim of the study is to analyze macroelemental composition of skeletal bones in rats of different ages after excessive palm oil (PO) intake and administration of *Garciniae cambogia extract (GE)* as medication.

The experiment involved 216 rats of three ages: immature, mature and senile. The animals were split into the groups as follows: the 1st group comprised control animals; the 2nd group comprised the animals that received intragastric PO in dosage of 30 g/kg, and the 3rd group—PO and intragastric *GE* in dosage of 0.25 g/kg. The animals were withdrawn from the experiment by the 1st, the 10th, the 30th and the 60th day after 6-week PO intake. Bones (tibiae, hipbones, and L3 vertebrae) were prepared for chemical analysis.

Excessive intake of PO resulted in destabilization of the macroelemental composition of tibia. The alterations began manifesting from the 1st day of observation and continued growing throughout the experiment. Ca share and Ca/P ratio in immature animals were lower than those of the controls by the 60th day by 5.99–6.85% and 5.31–6.29% ($p < 0.05$ in all cases). In mature animals the same values changed similarly—by 6.41–7.95% and 7.96–9.51% respectively. In senile rats the same values changed in the same way by 7.10–7.89% and 8.40–9.46% respectively. After *GE* administration, by the 60th day, in immature rats Ca share and Ca/P ratio increased as compared to the 2nd group by 4.74–7.15% and 3.76–6.72%, in mature rats by 4.69–7.29% and 6.29–9.03%, and in senile rats—by 5.66–6.22% and 3.76–7.01% respectively.

Thus, excessive intake of PO results in destabilization of the macroelemental composition of bones. Terms and intensity of alterations depend on age of animals. Administration of *GE* reduces adverse effects of PO on the macroelemental composition of bones.

Keywords: Bones, macroelemental composition, palm oil, *Garciniae cambogia extract.*