proinflammatory cytokines synthesis leads to increased bone fragility without decreasing BMD.

KEYWORDS: fracture risk, osteoporosis.

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TRANSFORMATION OF PROLACTINOMA INTO CORTICOTROPIN-SECRETING ADENOMA IN PATIENT WITH MEN 1 SYNDROME: A CASE REPORT

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Multiple endocrine neoplasia syndrome type 1 (MEN 1 type, Wermer's syndrome) is a group of heterogeneous inherited diseases, pathogenesis of which is based on hyperplasia or neoplasia of several endocrine glands, characterized by autosomal dominant mode of inheritance, high penetrance and similar prevalence among males and females. Prevalence of MEN 1 is estimated as 2—10 people per 100,000 of population. The patient turned to the doctor for the first time at the age of 20 with her primary amenorrhea. Examination revealed pituitary adenoma with pronounced secretion of prolactin (11,370 IU/L). She underwent transspenoidal adenomectomy, followed by drug treatment with dopamine agonists which normalized prolactin level, and restored menstrual function. At the age of 31 the acute gastrointestinal bleeding was the reason for further investigations and subsequent surgery. There were found gastrin-secreting tumor of the pancreatic gland and small tumors in the spleen area, as well as carcinoid in the mesentery area. At the age of 39 primary hyperparathyroidism (hypercalcemia, osteoporosis, high PTH level and parathyroid adenoma) was diagnosed. Parathyroidectomy was performed. Genetic analysis has revealed nonsense mutation Y77X in the Gene *Menin* in that patient and in her brother, thus MEN 1 type was confirmed. Nodular hyperplasia of both adrenals was visualized on CT. Disturbance of adrenocorticotrophic hormone secretion (in the morning 27 pg/mL, in the evening 33, 8 pg/mL) and cortisol secretion (in the morning 581 nmol/L, in the evening 338 nmol/L), high urinary free cortisol to 2,178 nmol/day, no suppression of cortisol secretion by 1 mg of dexamethasone were measured, and at the same time no clinical symptoms were detected. Cushing's disease was confirmed by inferior petrosal sinus sampling and functional tests. Pituitary surgery was not performed due to the absence of clinical manifestations of hypercortisolism. For the next 7 years active hypercortisolism was persisting, however clinical features appeared only last year. The patient underwent neurosurgical intervention in March 2017, remission of hypercortisolism was achieved. The clinical case may be called unique due the following reasons: multiple lesions of endocrine organs, of gastrointestinal tract; absolute synchronism of tumor development in various organs similar to those observed in her brother except hypercortisolism, as well as transformation of tumorigenesis in pituitary from prolactin-secreting tumor to ACTH-secreting tumor.

KEYWORDS: MEN 1 type; Wermer's syndrome; pituitary tumor; gene analysis.

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MOBILE APP ELECTRONIC DIARY IMPROVES THE MOTIVATION IN PATIENTS WITH GESTATIONAL DIABETES

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Introduction. In the course of gestational diabetes (GDM) treatment, it is significantly important to keep track on records in a personal diary, which helps physicians and patients to understand the problems appearing during blood glucose (BG) compensation. At the same time, the lack of motivation can lead patients to stop making records and exchanging them with their doctor. In our study we analyzed, how the electronic diary app can improve the motivation of patients in comparison with traditional means of perceiving data on blood glucose. **The aim** of the study is to improve the motivation in gestational diabetes patients by providing them with helpful tools to keep track on their records. **Material and methods.** Android and desktop application DiaCompanion was developed and given to a group of patients with diagnosed GDM. Another group of GDM patients received a traditional diary via Excel spreadsheet. Patients from both groups were asked to fill the diaries with the data on BG levels, insulin injections (when prescribed) and, if possible, food intakes, physical activity, sleep and ketones (when prescribed). **Results.** By the middle of march 2017, a total of 179 patients with GDM received an application DiaCompanion and 36 patients recorded their BG levels via Excel spreadsheet. A total of 24914 and 4247 BG records were analyzed correspondingly. A significant difference was shown in the amount of women quitting keeping records (6.0% vs 19.4% patients with less than 2 weeks of reports, p=0.029) and the average number of days with records (53.0 days against 40.2 days, p=0.006). Considerable amount of patients used an app to track additional records, while patients with traditional diary rarely reported any (98.6% against 44.4% reported food intakes (p=9.97·e-8), 59.6% vs 22.2% reported physical activity (p=6.64·e-6), 37.2% vs 5.6% sleep (p=6.37·e-9) and 21.6% vs 11.1% ketones (p=0.044) correspondingly). Average fasting BG levels during the whole course of monitoring were lower in women who used the app (4.88 vs 5.01 correspondingly, p=0.048), while postprandial BG values didn't show significant dif-

ference (6.27 vs 6.30 correspondingly, p=0.374). **Conclusion.** The use of the application helped to increase the length of monitoring period, the amount of data that patients perceived in the diary and improved glycemic control. This can be due to an increased motivation to keep records and to a reduction of burden associated with traditional diaries. More detailed analysis on achieving BG goals and delivery outcomes will be held in further studies.

KEYWORDS: gestational diabetes, mobile app.

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EFFECT OF FAMILY INTERVENTION TO CONTROL TYPE 2 DIABETES IN YOUNG: A CONTROLLED CLINICAL TRIAL

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Introduction. With the increasing number of young type 2 diabetes mellitus (T2DM) patients in India, it has become a great challenge for clinicians to achieve strict glycemic control and prevent complications in this population of patients. We studied the effectiveness of a family oriented intervention designed to improve glycemic control of these patients in a specialised diabetes clinic. There are very few studies have ever been done on this aspect on type 2DM. **Aim.** Our aim of this study was to see the effect of family intervention in these patients on glycemic control as reduction of HbA_{1c} to ⩽6.5 % over and above standard care. **Material and methods**. Young (18—25 years) newly diagnosed ,drug naïve T2DM patients from our clinic were selected for the study as per patient'. Patients were selected with type 2DM with HbA_{1c} between >7% to < 9% and living with at-least one family member(not alone). One group (A) of patients received the family oriented intervention; patients from the other group (B) received standard care. The intervention involved family members which included one amongst "father ,mother, wife or husband " and included family counselling during clinic visits, family meetings and home visits by a dedicated diabetes educator . The primary outcome was HbA_{1c}, measured at 6 and 12 months. **Result**. A total of 205 patients were enrolled and they were divided into group A (n=103) and group B (n=102). All patients completed the study. The HbA_{1c} from baseline to 12 months was a significantly different between groups (p<0.005). During the later period (6—12 months), when the patients in the group A showed further improvement in their HbA_{1c} reduction (p<0.001) compared to Group B patients. **Conlcusions.** In T2DM in young patients a significant reduction in HbA1c was seen when the family intervention was provided over standard intervention.

KEYWORDS: young type 2 diabetes mellitus, diabetes clinic, family intervention.

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ASSOCIATIONS OF THE POLYMORPHISMS KCNJ11, ADIPOQ, ADIPOR2, IGF1B2 OF THE GENES WITH INSULIN RESISTANCE AND FUNCTIONAL ACTIVITY OF PANCREATIC B-CELLS IN WOMEN WITH METABOLIC SYNDROME

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Purpose. To evaluate the association of alleles and genotypes of the polymorphisms KCNJ11 ADIPOQ, ADIPOR2, IGFBP2 genes with insulin resistance and functional activity of pancreatic β-cells in women with metabolic syndrome. **Material and methods.** A survey of women in the Russian population with obesity and metabolic syndrome. Insulin resistance (IR) and functional activity of pancreatic β-cells were determined using the HOMA-IR ⩾2.77 and HOMA-β ⩾180% indices (D. Matthews et al., 1985). The polymorphisms of the genes candidate for IR and insulinopenia were determined: rs16928751 of the *ADIPOR2* gene, rs2241766 of the *ADIPOQ* gene, rs5219 of the *KCNJ11* gene, rs4402960 of the *IGFBP2* gene. Genotyping of the polymorphisms of candidate genes of IR and insulinopenia was carried out on the basis of the Laboratory of Molecular Diagnostics and Genomic Dactyloscopy of the State Scientific Center of the Russian Federation «GosNIIGenetika», Moscow (Doctor of Biological Sciences, professor V.V. Nosikov). **Results.** Higher values of the HOMA-IR index [6.3 (3.6, 10.8)] in women with the Lys/Lys genotype of the polymorphism rs5219 of the *KCNJ11* gene were determined than in the carriers of the genotypes Glu/Glu and Glu/Lys 3,8 (2,2, 7,0) and 3,6 (2,3, 5,6) (p<0,01). It was established that HOMA-β index ⩾180% is more often detected in carriers of genotypes G/A + A/A (34.2%) than in persons with genotype G / G of the polymorphism rs16928751 of the *ADIPOR2* gene (18.8%) (p=0.04). The homozygous carrier of the T/T genotype of the polymorphism rs2241766 of the *ADIPOQ* gene was more often detected in obese and MS patients (94.3%) than in healthy individuals (72.1%)) (p=0.009). In women with obesity and IR, the carrier of the T allele and the T/T genotype of the polymorphism rs2241766 of the *ADIPOQ* gene increases (OR=3.21 95% CI 1.01—10.24; p<0.05 and OR=6.39 95% CI 1.32—30.86; p=0.009), and the carriage of the G allele and the G/T genotype of rs2241766 of the *ADIPOQ* gene reduces the risk of developing IR (OR=0.31 95% CI 0.10—0.99; p<0.05 and OR=0.04 95% CI 0.1—0.80; p=0.009). Carriers of the T/T genotype of the polymorphism rs4402960 of the *IGF1B2* gene had a higher HOMA-IR index, along with a low HOMA-β index of 7.0 (5.9; 8.9) and 59.1% (37.7; 153.8%) than individuals with genotypes G/G and G/T [3.9 (2.3, 7.4), 105.3 (53.1, 157.50 and 3.4 (2,2; 4.9), 121.3 (76.3, 170.9; p<0.05)]. **Conclusions.** These data suggest that the relationship between insulin resistance and the functional activity of β-cells of the pancreas of the polymorphisms rs5219 KCNJ11, rs2241766 *ADIPOQ*, rs4402960 *IGF1B2*,