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Background: For a whole month, every year Muslims fast daily from dawn to sunset. Those with health conditions that put them at risk are exempted from fasting, yet most of patients with diabetes choose to fast. Clinical and metabolic complications of diabetes during this month are issues of concern for patients and their managing physicians. This study is designed to evaluate the impact of fasting Ramadan on safety of patients.
Methods: A multicentercross-sectional survey was conducted in four hospitals under the Ministry of National Guard Health Affairs; King Abdulaziz Hospital,Al-Ahsa, Imam Abdulrahman bin Faisal Hospital, Dammam, King Abdulaziz Medicalcities, Riyadh and Jeddah. All patients with diabetes followed in the diabetes clinics of all four centers who fulfilled the study inclusion and exclusion criteria were approached within three months post Ramadan and consented for participation in the survey, then filled a self-administered validated questionnaire that consisted of 15 items.
Results: Socio-demographic,clinical, and laboratory characteristics of 1438 patients with diabetes were analyzed. The majority 1207 (83.9%) had type II diabetes, and 828 (57.6%) were females.The mean age was 57.9 ± 14.9 years, and mean BMI 25.25 ± 5.39.The majority 1060 (73.7%) had concomitant diseases. 36 (2.5%)were on diet therapy alone, 147 (10.2%) on metformin monotherapy, and 261 (18.2%) on insulin therapy alone. The remaining 994 (69.1%) were on combination of insulin and oral agents. Health education was received on average by 688 (57.8%) of patients. Out of the 1191 (82.8%) who fasted the full month, 497 (41.7%) experienced acute glycemic complications. Multivariate analyses revealed that significant predictors for unsafe fasting were: type I diabetes [OR 1.8 (95%CI 1.2 - 2.8), p-value 0.007], insulin therapy [OR 1.8 (95% CI 1.4 - 2.3), p-value0.0001], previous history of breaking fast for glycemic reasons [OR 2.1 (95% CI1.5 - 2.9), p-value 0.0001], and not receiving health education [OR 1.6 (95% CI1.2 - 2.0), p-value 0.0006]. Blood sugar control, presence of concomitant diseases, and history of diabetes related hospitalization were not statistically significant predictors [(OR 1.25, 95% CI, 0.9 - 1.7, p-value 0.15),(1.3, 95% CI, 0.9 - 1.8, p-value 0.14), (1.1, 95% CI, 0.8 - 1.6, p-value 0.45)] respectively.
Conclusion: A significant proportion of patients with diabetes do not receive specific education pertinent to fasting Ramadan. Lack of health education, in addition to; type I diabetes, insulin therapy, and previous experience of complications are predictors for unsafe fasting. This highlights the need for better structured educational programs and further research in the field.

Pediatric Endocrinology

PEDIATRIC PUBERTY, TRANSGENDER HEALTH, AND GENERAL ENDOCRINE

Loss-Of-Function Mutations in GATA4 in Patients with 46,XY Disorders of Sex Development Without Cardiac Defects

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Background: Disorders of sex development (DSD) encompass a wide range of conditions associated with numerous causative genes. In about 50-60% of 46,XY DSD individuals, the underlying molecular cause remains uncertain. *GATA4* haploinsufficiency has been described in patients with congenital heart defects (CHD), while only a few studies reported mutations related to 46,XY DSD phenotype. This study investigated clinical phenotypes and molecular characteristics of two 46,XY DSD patients with *GATA4* mutations. **Methods:** Mutation analysis was performed in patients with 46,XY DSD by whole exome sequencing (WES) using Illumina NextSeq platform. Clinical and endocrine characteristics were reviewed retrospectively. *GATA4* variants identified by WES were verified by Sanger sequencing. Functional activity of *GATA4* variants was tested by luciferase reporter assay on the *SRY* and *AMH* promoter using two different cell systems including HEK293 and NCI-H295R. **Results:** Subject 1 presented with micropenis and hypospadias at the age of 5 months. Karyotype was 46,XY. Mullerian duct remnants were not found in pelvic ultrasound. The patient underwent urethroplasty at the age of 10 months and was reared as a male. Subject 2 with complete female external genitalia was referred to our hospital because of 46,XY karyotype on G-scanning. The patient underwent laparoscopic orchiectomy at the age of 1.8 years and was assigned as a female. Both patients were responsive to hCG stimulation tests and did not have CHD. Subject 1 harbored a novel heterozygous variant of c.643A>G (p.R215G)] in *GATA4*, whereas a previously reported variant of c.1220C>A (p.P407Q) was identified in Subject 2. *In vitro* luciferase reporter assays using *SRY* and *AMH* promoter revealed decreased transcriptional activity of both p.P407Q and p.R215G. **Conclusions:** This study expanded phenotypic spectrum of mutations in *GATA4* in patients with 46,XY DSD without CHD. *GATA4* mutations in patients with 46,XY DSD may not be associated with CHD. Possible explanations for phenotypical variability comprise incomplete penetrance, variable expressivity, and oligogenic mechanisms.

Tumor Biology

TUMOR BIOLOGY: GENERAL, TUMORIGENESIS, PROGRESSION, AND METASTASIS

A Rare Combination of Severe Ectopic Cushing's Syndrome and Graves Hyperthyroidism: A Case Report

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