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**DYSFUNCTION OF URATE TRANSPORTER, ATP-BINDING CASSETTE SUBFAMILY
G MEMBER 2, IS ONE OF PREDICTIVE MARKERS FOR UROLITHIASIS**

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The prevalence of urolithiasis has been increasing in most countries. Urolithiasis is a quite heterogeneous clinical entity, associated with life styles, diet, climate and chronic diseases such as diabetes mellitus, obesity, metabolic syndrome, chronic kidney disease¹²³. Hyperuricemia is major condition increasing the prevalence of urolithiasis⁴. ATP-binding cassette (ABC) transporter, subfamily G, member 2, ABCG2, is a urate transporter and the ABCG2 dysfunction increases the risk of hyperuricemia. In this study, we investigated the estimated ABCG2 function by common two dysfunctional variants, Q126X (rs72552713) and Q141K (rs2231142), in patients with urolithiasis.

Purpose of the study: To evaluate the relation between urolithiasis and ABCG2 dysfunction.

Materials and Methods. One hundred and forty-seven urolithiasis patients without gout (120 males and 27 females) were enrolled. Genotyping of ABCG2 Q126X and Q141K was performed by high-resolution melting analysis with a LightCycler 480 (Roche Diagnostics). From the haplotype analyses reported in the previous studies⁵, there is no simultaneous presence of the minor alleles (risk alleles) of non-functional variant Q126X and half-functional variant Q141K in one haplotype. ABCG2 function was estimated from the genotype combination of Q126X and Q141K; i.e., full function, 3/4 function, 1/2 function and - 1/4 function. Serum uric acid levels and amount of urinary uric acid were measured. Renal uric acid handling of patients was classified into renal uric acid underexcretion type or renal uric acid overload type based on uric acid clearance and amount of urinary uric acid. Stone composition was analyzed, if possible.

Results. ABCG2 function of the patients was evaluated as follows: sixty-two patients, ABCG2 full function (42.2%); fifty-eight patients, 3/4 function (39.5%); twenty-five patients, 1/2 function (17.0%); two patients, 1/4 function (1.4%). The mean serum uric acid level and the amount of urinary uric acid were 5.71 - 1.19 (SD) mg/dL and 495.0 - 185.0 (SD) mg/day, respectively. One hundred and twelve patients were classified into renal uric acid underexcretion type, while twelve patients renal uric acid overload type. Stone composition analysis was performed for one hundred and thirty-six patients; calcium oxalate stone was identified in 107 patients and uric acid stone in 29 patients.

ABCG2 dysfunction is identified in about 80 % of gouty patients⁶. In this study, 57.8 % of the patients with urolithiasis had ABCG2 dysfunction as against 50.0 % of the healthy individuals previously reported⁷. As the number of the patients was not enough, the difference was not statistically significant. The high ratio of ABCG2 dysfunctional patients with urolithiasis suggested that ABCG2 dysfunction is a risk factor for urolithiasis.

In the patients with urolithiasis, renal uric acid underexcretion type accounted for about 90 % of the patients. This means that this type accelerated urolithiasis as well as hyperuricosuria.

Conclusions: ABCG2 dysfunction and renal uric acid underexcretion type were suggested to be a risk factor for urolithiasis.

Prospects for further research: Establishment of ABCG2 dysfunction and renal uric acid underexcretion type as risk factor for urolithiasis is necessary. It remains to be further investigated how ABCG2 dysfunction and this type are associated with stone formation. Further research is required.

References:

1. Khan A: Prevalence, pathophysiological mechanisms and factors affecting urolithiasis. *Int Urol Nephrol* 50:799-806, 2018
2. Polat EC, Ozcan I, Cakir SS, et al: Relationship between Calcium Stone Disease and Metabolic Syndrome. *Urol J* 12:2391-5, 2015
3. Saucier NA, Sinha MK, Liang KV, et al: Risk factors for CKD in persons with kidney stones: a case-control study in Olmsted County, Minnesota. *Am J Kidney Dis* 55:61-8, 2010
4. Li X, Meng X, Timofeeva M, et al: Serum uric acid levels and multiple health outcomes: umbrella review of evidence from observational studies, randomised controlled trials, and Mendelian randomisation studies. *BMJ* 357:j2376, 2017
5. Ichida K, Matsuo H, Takada T, et al: Decreased extra-renal urate excretion is a common cause of hyperuricemia. *Nat Commun* 3:764, 2012
6. Matsuo H, Takada T, Ichida K, et al: Common defects of ABCG2, a high-capacity urate exporter, cause gout: a function-based genetic analysis in a Japanese population. *Sci Transl Med* 1:5ra11, 2009
7. Matsuo H, Ichida K, Takada T, et al: Common dysfunctional variants in ABCG2 are a major cause of early-onset gout. *Sci Rep* 3:2014, 2013

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THE GENOTYPIC SPECIES OF ROTAVIRAL INFECTION IN INFANT IN REPUBLIC OF MOLDOVA

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Rotavirus (RV) is the most common cause of acute gastroenteritis (GEA) worldwide, affecting 95% of children up to the age of five. Globally, RV infection is estimated to cause 3.6 million episodes of GEA per year. Until the implementation of anti-rotavirus immunization, around 2 million children with GEA of rotavirus etiology were hospitalized worldwide each year. By the age of 5, virtually all children have sustained rotavirus infection, this being the first cause of severe diarrhea with dehydration in infants around the world. In low-income countries, the average age of primary rotavirus infection is between 6 and 9 months (80% of cases occur in infants under one year of age), while in high-income countries the first episode sometimes occurs between 2 and 5 months (65% of cases were seen in infants < 1 year). WHO estimates that before the occurrence of the anti-rotavirus vaccine there were approximately 453,000 deaths per year among children with rotavirus gastroenteritis (GERV) worldwide. These data accounted for approximately 5% of deaths among children, with a specific mortality rate of 86 deaths per 100,000 children < 5 years. Low-income countries from Africa and Asia are hosts for almost 90% of the deaths caused by rotavirus thanks to the poor quality of health care. Implementation of sentinel surveillance of rotavirus infection in infants from the Republic of Moldova in 2008 showed a high rate of this infection (40.0%) being an argument in recommending anti-rotavirus immunization in children within the National Immunization Program Purpose: to study the clinical-evolutionary, molecular and epidemiological aspects of rotavirus infection in infants.

Materials and Methods. The study was carried out between 2012 and 2016 and included children admitted to IMSP Municipal Children's Clinical Hospital no. 1, acute diarrheal diseases section. In the study, 193 infants with the acute diarrheal disease were monitored, under standard framework of sentinel surveillance. Depending on