MP43-08

USE OF SIP^{IT} INTERVENTION TO REDUCE COMMON PERCEIVED BARRIERS TO INCREASING FLUID INTAKE AMONG ADULT PATIENTS WITH KIDNEY STONES

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INTRODUCTION AND OBJECTIVE: Compliance with increasing fluid intake to produce at least 2.5L of urine daily for stone prevention is commonly below 50%. We previously identified patient interest in the use of mobile applications (apps) and connected water bottles, and demonstrated that wrist-worn sensors with accelerometers can detect drinking behavior and provide automated lapse detection in fluid intake in the lab setting. From these studies we developed the sip^{IT} intervention which is a context-sensitive behavior change system that incorporates a wrist-worn sensor (Fitbit Versa watch), connected water bottle (H20Pal) and self-monitoring through mobile apps. The purpose of this study was to determine the feasibility and acceptability of sip^{IT} intervention in the clinical setting. In addition, the changes in perceived barriers to increasing fluid intake were evaluated.

METHODS: Patients with kidney stones were recruited from the community and a specialty kidney clinic to participate in a 3-month feasibility trial. Patients were given a Fitbit Versa watch with the sip^{IT} app installed and an H20Pal connected water bottle. They completed a questionnaire to determine perceived barriers to increasing fluid intake at baseline, 1 and 3 months.

RESULTS: 31 patients with a history of kidney stones were enrolled to participate (58% female, age = 40.0±14.3 years). Findings are based on n=27 who completed the entire 3-month intervention. At the end of the intervention, patients reported that forgetting to drink and lack of thirst were less of a barrier to meeting fluid intake goals, 27% and 48% reduction respectively. Most participants perceived that the sip^{IT} intervention helped them to achieve their fluid intake goals and would recommend it to other patients with a history of kidney stones (83%).

CONCLUSIONS: The sip^{IT} intervention may be used to detect drinking behavior and provide automated lapse detection in fluid intake in the clinical setting. The system was acceptable to patients and there was reduction in common perceived barriers to fluid intake. Combining digital tools with behavioral science may improve adherence to fluid intake recommendations.

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MP43-09

DRINKING MINERAL WATER FOR PREVENTION OF CALCIUM OXALATE STONES - A PROSPECTIVE RANDOMIZED CONTROLLED STUDY IN AN ASIAN COHORT

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INTRODUCTION AND OBJECTIVE: Drinking mineral water has shown some benefit in reducing urinary stone recurrences in some studies. Our pilot study in 10 healthy subjects revealed significant reductions in urinary oxalate (Ox) and increase in magnesium (Mg), citrate (Cit) and pH after consumption of bicarbonate rich mineral water for 1 week. Calcium oxalate (CaOx) supersaturation (calculated with Tiselius index) revealed significant reduction. We now compared the effect of taking bicarbonate rich mineral water with tap water in patients with known CaOx stones.

METHODS: This was a prospective randomized controlled study comparing the effects of a bicarbonate rich mineral water (Ardesy) versus tap water on urine biochemistry in patients with proven CaOx stones (CaOx >50% by infrared spectroscopy). All patients received standard dietary counselling for stone prevention. The mineral water group were instructed to consume at least 1.25L of mineral water per day at meal times, supplemented by other fluid intake up to 2.5L/day. Control group consumed tap water up to 2.5L/day. 24h urine analyses were performed at baseline, 1, 4, and 8 weeks after starting protocol and compared using the generalised estimating equation (GEE) model. The Institutional Review Board of SingHealth approved the study (CIRB Ref 2016/3161).

RESULTS: 58 patients were recruited for the study (27 randomized to the mineral water group and 24 to the tap water group). 7 patients dropped out. Baseline data and 24h urine analyses were comparable between the 2 groups. Over the course of 8 weeks, compared to patients drinking tap water, those drinking mineral water had overall higher urinary levels of Mg (difference=1.869 mmol/day, 95% CI=(1.360, 2.378)), Cit (difference=0.588 mmol/day, 95% CI=(0.168, 1.007)), Sodium (difference=36.477 mmol/day, 95% CI=(16.9, 56.055)), Calcium (difference=1.080 mmol/day, 95% CI=(0.317, 1.842)) and pH (difference=0.509, 95% CI=(0.317, 0.701)). There was no statistical difference in urinary Ox, and the Tiselius index for urinary CaOx was similar between the groups.

CONCLUSIONS: Drinking bicarbonate rich mineral water in CaOx stone formers increased urinary Mg, Cit, Sodium and Calcium; and alkalinized the urine compared to patients drinking tap water. There were no significant differences in urinary Ox or CaOx supersaturation. Consumption of bicarbonate rich mineral water may have benefits in urinary stone prevention.

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MP43-10

ASSOCIATION BETWEEN PHARMACOLOGICAL TREATMENT OF OSTEOPOROSIS AND KIDNEY STONES IN NATIONAL HEALTH AND NUTRITION EXAM SURVEY (NHANES) RESPONDENTS

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INTRODUCTION AND OBJECTIVE: Kidney stones and osteoporosis are two very common diseases in the United States. The pathophysiology of these diseases overlap in a number of metabolic processes. Recent studies have shown an association between the diagnosis of Osteoporosis and prior urinary calculus. Our aim was to use the NHANES database to investigate whether the treatment of osteoporosis with pharmacological interventions changes the occurrence or frequency of stone disease in this subpopulation.

METHODS: This is a cross-sectional study which analyzed data from the NHANES surveys in 2007-2008, 2009-2010, and 2013-2014. We collected information from the surveys regarding age, gender, race, level of education, BMI, prescription medications, history of kidney stones, and number of kidney stones passed on all patients who reported having osteoporosis in these years. This data was then stratified and analyzed.

RESULTS: Data on 1,060 patients was collected of which 321 received pharmacological intervention for osteoporosis and 739 did not. 14.2% of these patients reported a history of kidney stones. The majority of patients in the study were female (86.7%) and older than 50 (92.0%). Pharmacologic treatment for osteoporosis was associated with a decrease in kidney stone history (15.4% of untreated and 11.2% of treated patients) which approached, but did not reach, statistical significance (OR= .693 [CI= .464-1.033]). When stratified for age, this effect became significant in patients over the age of 50 (OR= .629 [CI= .408-.969]). There was no significant difference when stratifying for gender, BMI, educational status, thiazide use, calcium supplementation, or vitamin D supplementation. Treatment did not have an effect on the number of kidney stones a patient passed.

CONCLUSIONS: Our results show that pharmacologic treatment of osteoporosis may be associated with a lower risk of kidney stone formation, specifically in the population over the age of 50. This new information may help guide clinical treatment and screening decisions