appropriate sequence of use of US and CR in patients with suspected CPPD: in case of a positive CR at any of the 3 sites (menisci and HC) no additional exam is necessary, and the same in case of a positive US in at least two sites; however in case of a negative CR, US could help in a statistically significant way to identify CPPD patients, and further in case of a positive US in a single site CR can offer additional information.


<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>SP</th>
<th>PPV</th>
<th>NPV</th>
<th>ACC</th>
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<tr>
<td>MM</td>
<td>0.88</td>
<td>0.81</td>
<td>0.82</td>
<td>0.88</td>
<td>0.84</td>
</tr>
<tr>
<td>LM</td>
<td>0.88</td>
<td>0.73</td>
<td>0.76</td>
<td>0.86</td>
<td>0.80</td>
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<tr>
<td>HC</td>
<td>0.78</td>
<td>0.86</td>
<td>0.82</td>
<td>0.83</td>
<td>0.82</td>
</tr>
<tr>
<td>Overall</td>
<td>0.92</td>
<td>0.64</td>
<td>0.73</td>
<td>0.89</td>
<td>0.78</td>
</tr>
<tr>
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<tr>
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<td>HC</td>
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<td>0.93</td>
<td>0.85</td>
<td>0.68</td>
<td>0.73</td>
</tr>
<tr>
<td>Overall</td>
<td>0.54</td>
<td>0.92</td>
<td>0.88</td>
<td>0.66</td>
<td>0.73</td>
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<tr>
<td>US + CR</td>
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<tr>
<td>LM</td>
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<tr>
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<tr>
<td>Overall</td>
<td>0.92</td>
<td>0.56</td>
<td>0.67</td>
<td>0.68</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Figure 1. evaluation of sequence of US and CR

Conclusion: US confirmed a high diagnostic accuracy in identifying patients affected by CPPD at knee level, while CR demonstrated a high specificity but a low sensitivity. Performing both diagnostic tests could make sense in case of a negative CR or in case of an inconclusive US (only one positive site). To our knowledge, this is the first study that investigates the role of the combination of the two exams in CPPD. Further studies in a large number of patients and in different joints would be helpful to address this point.

REFERENCES:

Disclosure of Interests: None declared

POS0277

EFFECT OF COLCHICINE THERAPY ON Atherosclerosis-related cardiovascular outcomes in patients with calcium pyrophosphate crystal deposition disease

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Background: anti-inflammatory therapy supposed to influence the rate of cardiovascular events development in pts with calcium pyrophosphate deposition disease (CPPD).

Objectives: To assess the effect of colchicine, hydroxychloroquine, and methotrexate on cardiovascular outcomes (CVO) in CPPD pts.

Methods: The study included 305 pts with CPPD: 115 (37.70%) men, 190 (62.30%) women. The average follow-up period was 3.9±2.7 yrs. Among the factors influencing CVO were considered: gender, age, smoking, alcohol intake ≥20 standard doses/week, hypertension, history of cardiovascular disease (CVD); ischemic heart disease (CHD), acute myocardial infarction myocardial infarction (AMI), acute cerebrovascular insufficiency (ACV), chronic heart failure (CHF) ≥3 grade, NYHA), diabetes mellitus (DM), BMI ≥25 kg/m² and >30 kg/m², cholesterol level >5.1 mmol/l, GFR <60 mg/ml/1.73 m², serim uric acid (sUA) > 360 µmol/l, hypercalcaemia (serum calcium ≥2.62 mmol/l), CRP ≥2 mg/l, hyperparathyroidism (parathyroid hormone > 65 pg/ml), phenotypes of CPPD (asymptomatic, osteoarthritis with calcium pyrophosphate crystals (OA with CPP crystals), chronic arthritis, acute arthritis, taking colchicine, hydroxychloroquine and methotrexate, glucocorticoids (GCs) and non-steroidal anti-inflammatory drugs (NSAIDs). Information about mortality, regardless of cause, was noting down throughout the follow-up period.

The causes of death were determined on the patient's death certificate, and then classified according to the International Classification of Diseases of the 10-th Revision (ICD-10) All newly developed cases of non-fatal cardiovascular events were identified on the basis of medical documentation. The odds ratio (OR) with a 95% confidence interval of developing cardiovascular events was calculated. Statistica 12.0 package was used for statistical data processing.

Results: The mean age at inclusion was 58.9±12.5 yrs. 264 patients were available for follow-up. Any of the studied cardiovascular events were registered in 79 (29.9%) pts. During the follow-up period, 46 (17.4%) pts died; 35 of 46 (76.1%) pts died because of CVD; 11 (23.9%) pts died due to other causes. Non-fatal cardiovascular events were registered in 44 (16.7%) pts.

The risk of cardiovascular events was higher for ps aged ≥65 yrs (OR 5.97, 95% CI 3.33-10.71), serum cholesterol level ≥5.1 mmol/l (OR 1.95, 95% CI 1.04-3.65), GFR ≥60 mg/ml/1.73 m² (OR 2.78, 95% CI 1.32-5.56), hyperparathyroidism (OR 2.78, 95% CI 1.32-5.56), hypercalcaemia (serum calcium ≥2.62 mmol/l), CRP ≥2 mg/l, hyperparathyroidism (parathyroid hormone > 65 pg/ml), phenotypes of CPPD (asymptomatic, osteoarthritis with calcium pyrophosphate crystals (OA with CPP crystals), chronic arthritis, acute arthritis, taking colchicine, hydroxychloroquine and methotrexate, glucocorticoids (GCs) and non-steroidal anti-inflammatory drugs (NSAIDs). Information about mortality, regardless of cause, was noting down throughout the follow-up period.

Conclusion: Adverse CVO outcomes in CPPD pts are associated with age, hypercholesterolemia, CKD, and a history of CVD. The intake of colchicine, but not methotrexate and hydroxychloroquine, by patients with CPPD is associated with decline of risk of cardiovascular events.

REFERENCES:

Disclosure of Interests: Elena Cheremushkina: None declared, Maxim Eliseev Speakers bureau: Berlin Chemie Menarini Group, Sobi, EGIS, CSC, MosFarma, Allium Group, Olga Sheliabina Speakers bureau: Berlin Chemie Menarini Group, Aleksandra Novikova: None declared, Svetlana Glukhova: None declared

POS0278

COMPARISON OF ULTRASOUND BEAM ATTENUATION BY CALCIUM PYROPHOSPHATE, HYDROXYAPATITE AND MONOSODIUM URATE CRYSTALS: A PROOF-OF-CONCEPT STUDY

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Background: Ultrasound (US) demonstrated to be reliable and accurate for the diagnosis of crystal induced arthropathies, especially gout and calcium pyrophosphate deposition disease (CPPD) and validated definitions for uric acid and calcium pyrophosphate deposition in joints were released by the Outcome Measures in Rheumatology (OMERACT) US group. Less is known regarding hydroxyapatite (HA) deposition disease (HAAD) and the role of US in the assessment of HA crystal deposition.

It is general belief that HA crystals create posterior acoustic shadowing, monosodium urate crystals do not attenuate the US beam.

Objectives: Aim of this proof-of-concept study was to investigate the US appearance in terms of beam attenuation due to increasing concentrations of MSU, CPP and HA crystals.

Methods: Sixteen synthetic crystal suspensions with known concentrations of CPP (26-109 mg/ml), HA (31-153 mg/ml) and MSU (90-500 mg/ml) were prepared. These specific concentrations were selected to replicate the X-ray attenuation characteristics of those crystals when imaged by conventional radiography.
computed tomography (CT) and dual-energy CT (DECT) in vivo[1]. The density of the agar-based lipogel background was intentionally increased to mimic the X-ray attenuation of hyaline cartilage (i.e., 100-120 HU at 120 kVP). Each crystal suspension was placed in a plastic container filled with US gel, next to the control (i.e., crystal-free background) calibration phantom. We acquired all US images using a Samsung RS80A system equipped with a high-frequency linear array transducer (4-18 MHz) set at the maximum frequency, by applying the same settings. US scans were performed by a single experienced sonographer, blinded to the crystal type and concentration. For each of the 16 crystal suspensions, at least two images were recorded both in the long- and short-axis views, the latter including the control phantom in the field of view. Interpretation of US images for the extent of US beam attenuation and the presence of acoustic shadowing was performed in consensus with a second experienced sonographer.

Results: None of the five CPP phantoms generated posterior acoustic shadowing or US beam attenuation regardless of CPP concentration. HA 31 mg/mL did not generate US beam attenuation, while HA 62, 92 and 123 mg/mL generated a progressively increasing US beam attenuation with posterior acoustic shadow clearly generated by HA 153 mg/mL. Similarly, MSU 90 mg/mL did not generate US beam attenuation. MSU 195 mg/mL generated only a faint US beam attenuation that became progressively more visible at 270 and 345 mg/mL, even if a clear posterior acoustic shadow was detectable only with MSU 420 and 500 mg/mL (Figure 1).

Conclusion: This proof-of-concept study confirmed that in the concentrations of crystals encountered in vivo, CPP do not generate posterior shadowing, while MSU and HA determine US beam attenuation proportionally to the concentration of the crystals. Being this a proof-of-concept study, attenuation of the US beam was assessed empirically and not in a quantitative or semi-quantitative way. However, this study highlights the potential of US to differentiate between CPP, MSU and HA crystals based on their appearance on gray scale imaging. Future studies should be carried out with different crystal concentrations, different US equipment and settings in order to create a scoring system for US beam attenuation that is actually lacking.

REFERENCES:

Disclosure of Interests: None declared

**THE ABCG2 RS2231142 POLYMORPHISM ARE ASSOCIATED WITH RISK OF NPHRLITHIASIS IN A TAIWANESE POPULATION.**

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Background: In genome-wide association studies (GWAS), the strong association of ABCG2 rs2231142 variant with hyperuricemia and gout was confirmed in Asian population. Additionally, the obesity, diet, lifestyle, genetics and underlying comorbidities are important risks factors predisposing to hyperuricemia and gout. The systematic reviews revealed a significant link between obesity, systemic comorbidities and hyperuricosuria for the predisposition of kidney stones (nephrolithiasis). However, whether ABCG2 plays an important role in the pathogenesis of nephrolithiasis remains unclear. The interaction between genetic factors and other risk factors of nephrolithiasis is still elusive.

Objectives: In this study, we want to explore the association between ABCG2 rs2231142 variant and the risk of nephrolithiasis in modern Taiwanese population, and clarify the role of uric acid in nephrolithiasis formation.

Methods: This retrospective case-control study was conducted using the Taiwan Biobank database. A total of 120,267 individuals of Taiwanese Han Chinese aged 30-70 years were enrolled in the study. The primary outcome was the incidence of self-reported nephrolithiasis. Odds ratio (OR) of incident nephrolithiasis was analyzed by multiple logistic regression models and the interaction between ABCG2 rs2231142 variants, serum uric acid level, on the nephrolithiasis was explored. The multifactorial confounding factors for prediction of nephrolithiasis were also re-examined in our study.

Results: Finally, we identified 8,410 participants with nephrolithiasis and the prevalence was 11.52% and 4.37% in men and women, respectively. Older age (OR=1.08, 95% CI: 1.02-1.03, p<0.001) and male gender (OR=2.21, 95% CI: 2.08-2.36, p<0.001) showed an independent predictor for development of incident nephrolithiasis. The risk of nephrolithiasis markedly increased resulting from the interaction of ABCG2 rs2231142 and hyperuricemia. In comparison with GG genotype, the risk of nephrolithiasis also demonstrated a significant association with TT and GT genotype (TT: OR=1.18, 95% CI: 1.09-1.28, p<0.001; GT: OR=1.12, 95% CI: 1.06-1.18, p<0.001). The variant comorbidities significantly associated with susceptibility to nephrolithiasis are hyperuricemia (OR=1.40, 95% CI: 1.29-1.51, p<0.001), hypertension (OR=1.67, 95% CI: 1.57-1.78, p<0.001), diabetes mellitus (OR=1.16, 95% CI: 1.06-1.26, p=0.002), and hyperuricemia (OR=1.06, 95% CI: 1.04-1.08, p<0.001) with significant difference. The interaction of lifestyle factors and the risk of nephrolithiasis revealed significant differences in smoking (OR=1.15, 95% CI: 1.09-1.22, p<0.001) and overweight (ORs=1.22, 95% CI: 1.15-1.28, p<0.001) rather than alcohol use (OR=0.92, 95% CI: 0.84-1.01, p=0.083). Participants with regular physical exercise is a protective factor from nephrolithiasis (OR=0.95, 95% CI:0.9-1.0, p=0.048).

Conclusion: Our study demonstrated the risk of nephrolithiasis is significant association with ABCG2 rs2231142 variants. This risk also increased with systemic comorbidities (hyperuricemia, hypertension, diabetes mellitus, and hyperuricemia), and lifestyle (obesity, and smoking). Regular physical exercise is associated with protective factor for incident nephrolithiasis.