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Studies on the effect of vitamin C on crystallization and crystal growth inhibition and dissolution of struvite crystals – an in vitro study

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Objectives: -Effect on the of vitamin C on crystallization and crystal growth inhibition
-Dissolution of struvite stone

Methods: In this *in vitro* study the inhibitory effect of vitamin C in artificial urine was investigated against formation of struvite crystals. Struvite crystallization intensity was determined using single gel growth techniques. The crystals grown in presence of vitamin C and control were characterized by Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy (ATR-FT-IR), X-ray powder Diffraction (XRD) and Field Emission Scanning Electron Microscope (FESEM). In addition, using an *in vitro* model, dissolution of struvite crystal in synthetic urine in the presence of vitamin C was also evaluated.

Results: Decreased in the number,weight, dimension, growth rate, depth of growth of struvite crystals and dissolved rapidly with the increasing concentrations of vitamin C was observed. As monitored by light microscopy, presence of vitamin C in the media slowed the crystal growth and the crystals assumed an octahedral crystal habit. ATR- FT-IR spectra of struvite crystals revealed the presence of characteristic functional groups. Powder XRD study also confirmed the structural similarity of the crystals grown *in vitro*. Crystals grown in the presence of vitamin C were pitted on their surface as shown by FESEM.

Conclusions: Vitamin C can modulate the formation of struvite crystals and can hence be explored in to their potential application in the inhibition of struvite stone formation.