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INTRODUCTION

To date, vascular calcification could be defined as a multifactorial process that associates with age, atherosclerosis, chronic kidney diseases (CKD), diabetes, and chronic inflammatory disease. The deposition of calcium phosphate crystals in the medial and intimal layers of the arteria increases the odds of stroke. Cell culture and animal studies provided insights into possible causes of vascular calcification. Among proposed mechanisms of vascular calcification in humans are deregulated calcium metabolism, chronic inflammation, smooth muscle cells reprogramming, and abnormal phosphate metabolism. However, the precise mechanism of vascular calcification in humans remain largely unknown.

METHODS



We collected carotid and aorta plaques of the 16 CVD patients underwent surgery. Calcium deposits were stained by alizarin red in order to confirm calcification status.

RESULT

Results: Alizarin Red staining of 16 artery samples from 3 females and 13 males (mean age 65, interval 44-79) was performed. Interestingly, **BMI, cholesterol, HDL, LDL, triglyceride, glucose, and VLDL level (Table 1, Figure 1A-C)** didn't show any correlation with calcification status, while erythrocyte sedimentation rate (Figure 1D) is strongly positively associated with the severity of calcification in humans (**4.7±3.8 vs 18±3, adj. p-value < 0.05**).

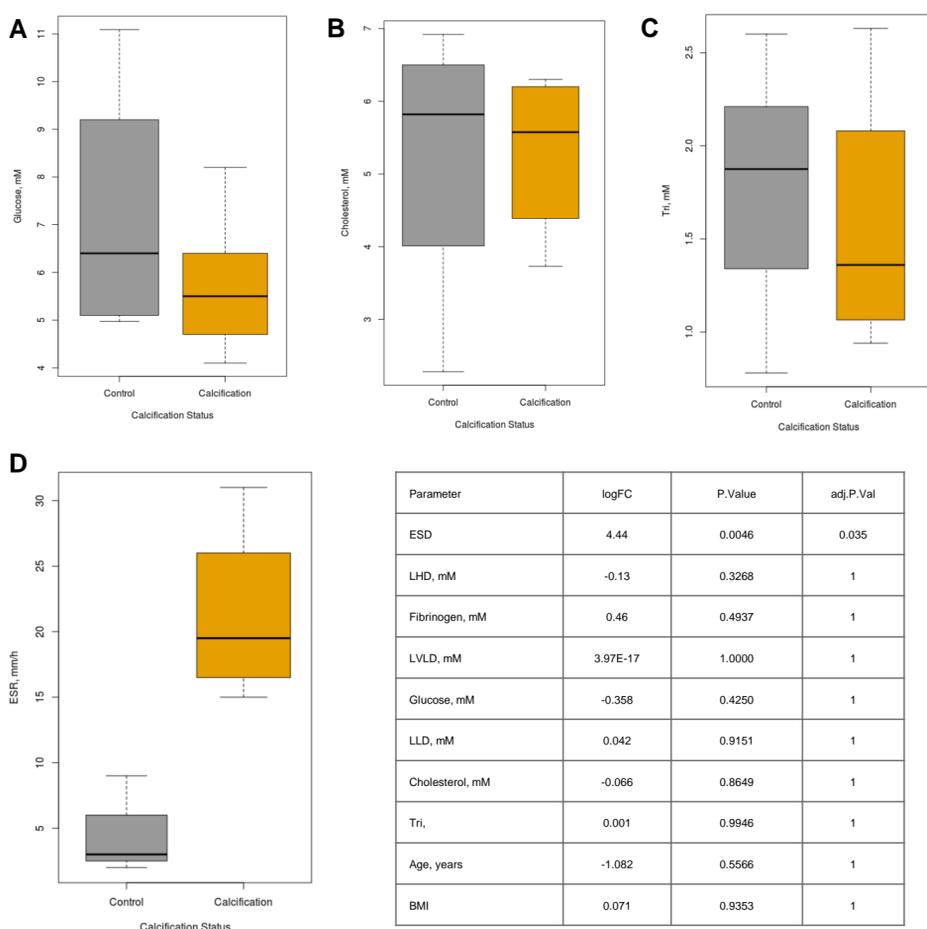


Figure 1. Vascular calcification didn't show associations with (A) glucose, (B) cholesterol, and (C) triglyceride levels, while erythrocyte sedimentation rate (D) was statistically significant increased in those patients.

Table 1. Regression analysis of the clinical characteristics and vascular calcification status in humans. ESR - erythrocyte sedimentation rate, LHD - lipoproteins of high density, LVLD - lipoproteins of very low density, LLD - lipoproteins of low density, BMI - body mass index.

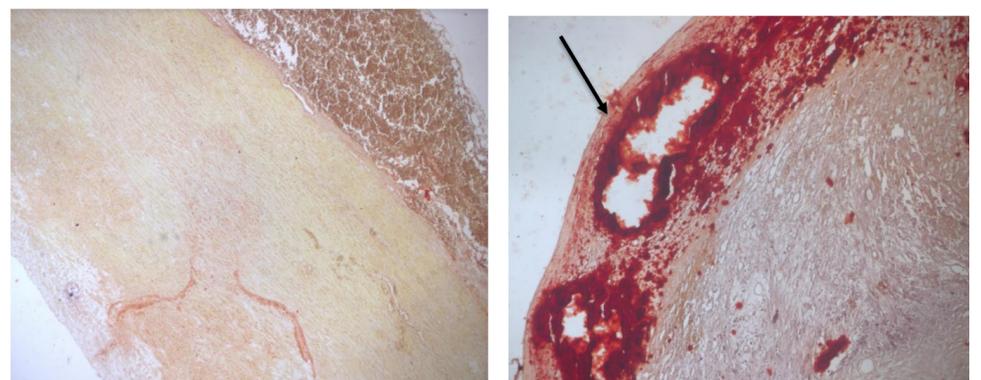


Figure 2. Human arterial samples staining by Alizarin Red. Arrow is indicating location of the calcium deposits (colored by red).

Presence of **calcium deposits** was histologically detected in half of the patients confirming the high prevalence of calcification among diverse cardiovascular pathologies. Based on calcified area samples were classified as free of calcification, moderate (<10% of vessel area) and **extremely calcified (>10%)**.

DISCUSSION: ESR serves as a nonspecific marker of inflammation. In recent years multiple evidence of involvement of the inflammatory processes in vascular pathologies have emerged. **Here we've shown that ESR is increased in patients with vascular calcification.** We speculate that inflammation may contribute to calcification development more than aberrant fat metabolism, nevertheless, larger studies are needed to confirm.

CONCLUSIONS

This pilot study of 16 patients revealed the possible role of inflammation in the development of vascular calcification in humans.

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