Expectation from science/Prevention of calcification with TPEN in pericardial bio-prosthetic heart valve material

Bilimden beklenen/Biyoprostetik kalp kapağı materyalinde kalsifikasyonun TPEN ile önlenmesi

Dear Editor,

Among the individual opinions, expectation from the science through with the experimental evidences is not only to increase the factual knowledge but it also be a useful for our practical lives. So this unbearable attraction towards the sovereignty to nature will both predict and protect from the risk factors that we come across in our environments.

The results and the way of their discussions of these important meanings refereed researches make them naturally be important facts. That is why the researcher with Claude Bernard's words must put off his imaginations like his jacket while he was entering to laboratory but he can put it on when he was leaving (1). In my opinion, his idea was the golden rule for both preparing and carrying out the experiments of the research proposal.

I read with interest the article by Döndaş et al. (2) recently published in the Anadolu Kardiyoloji Dergisi. The idea of TPEN, a common zinc chelator, can also be used for the decalsifying properties seemed interesting to me in this manuscript. Still some parts of the entire text need some modifications and more explanations. From the experimental experiences on the Zn^{+2}, Ca^{+2} and TPEN (3), I conclude that the authors must enlarge the discussion towards the ability of chelation of the other divalent ions by TPEN. Additionally, the carriers used for TPEN also have a potential risk factor for the biological materials. So, this issue was also needed to be expanded in the material section of the prepared manuscript.

In addition to these two main points, the prepared manuscript needed; 1- explanations of the experimental animals, 2- change in the way of statistical data presentation and 3- Turkish and English abstract must have the same ingredients. The revised form of this manuscript, through with the authors scientific manner, meets the needs both by replying to some of my criticisms and making appropriate changes in the text.

I believe that the criticism of a scientific work with a rationalist point of view is one of the most important issues in science. Both the objective criticisms and the professional way of author's behaviors make this publication period be desirable scientific atmosphere.

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Author Reply

Dear Editor,

I will try to respond to the comments for our manuscript "Prevention of Calcification with TPEN in Pericardial Bioprosthetic Heart Valve Material" published in the December issue of the journal with the hope that the hesitations about the manuscript can be obviated.

TPEN is prepared with ethanol and the concentrations of TPEN between 100nM–2 µM are reported to be harmless to the tissues. Therefore, in our study, we used the highest allowable concentration. In this study our aim was to investigate the prevention of calcification in bioprosthetic materials due to the adverse effects of glutaraldehyde fixation and therefore we concentrated on the effect of TPEN on calcium. Calcium has been indicated as the target element on pericardial bioprosthetic materials as well. TPEN has less affinity to Ca^{2+} compared to Zn^{2+} but it activates the calcium channels and banishes calcium from the medium. In this context, it leads to calcium regulation and is effective on myocardial protection which partly supports our results (1, 2). Even in these studies the effects of TPEN on Ca^{2+} was brought forward rather than its effects on Zn^{2+}. In the discussion section, we mentioned that in the study group specimens calcific degeneration was also seen. This might be due to the interaction of TPEN with other metals like Zn^{2+} ,Fe^{2+}, Mn^{2+} as the author described and that is why we concluded that TPEN on its own was inadequate in preventing calcification on pericardial bioprosthetic materials but could be used as an adjuvant with other decalcifying agents.

In the third paragraph of his comments, the author mentioned the problems that could have been raised by the preparation of TPEN with ethanol. Many studies showed that ethanol banishes phospholipids and cholesterol from the valves, changes the structure of the collagen and increases the resistance to collagenase hence increases the stability and with these effects prevents calcific degeneration (3-6). In this context, we therefore can only expect the beneficial impact of ethanol.

Yours sincerely,

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