



Specific IgE levels in pericardial and cerebrospinal fluids in forensic casework: The presence of additional molecules for sudden cardiac death diagnosis

Palmieri properly stated in a comment [1] regarding determination of specific IgEs, in pericardial fluid, that additional molecules might be proven helpful for forensic diagnostic purposes including mast cell tryptase in case of anaphylactic death as well as troponin I or T, creatine kinase, myoglobin and natriuretic peptides for establishment of deaths induced by myocardial damage. Indeed, there are some limitations concerning the above mentioned molecules, as the fact that increased tryptase levels have been reported to be unrelated to anaphylaxis [2]. However, several new precise methods for post-mortem anaphylactic identification have been introduced recently, as measurement of carboxypeptidase A, histamine and other related cytokines in the pericardial fluid and pericardial tissue.

Carboxypeptidase A (also known as carboxypeptidase A3, CPA3) is secreted by mast cells during anaphylactic reactions. In a recent study, CPA3 molecule reported to be significantly increased in both postmortem serum and pericardial fluid from anaphylaxis cadavers compared with the controls [3]. The authors also recommended that both carboxypeptidase and tryptase level measurement could promote the establishment of postmortem anaphylaxis diagnosis. Furthermore, determining levels of these mediators from the pericardial fluid in the closed serous cavity might contribute to avoid any possible contamination after death.

Pericardial involvement is generally manifested not only as fluid accumulation in the pericardial sac but also as an inflammatory reaction of the pericardial tissue that can be further identified with histological examination by the presence of lymphocytes, macrophages, neutrophils and even mast cells infiltration of the surrounding vascular area in pericardial tissue. In addition, histamine concentration, expression of histamine H4 receptor and histamine releasing factor receptor determined at mRNA and protein level, could be quantified in pericardial fluid as inflammatory modulators. Samples of pericardial tissue and fluid obtained during cardiac reconstruction surgery in children [4] revealed elevated histamine levels in pericardial fluid, localized expression of histamine H4 receptor in mast cells as well as histamine releasing factor receptor at mRNA in the extracted pericardium tissue.

As we have emphasized recently [5], the examination of accumulated fluids and tissues infiltrated by allergic inflammatory cells especially mast cells and eosinophils could be proven of paramount importance for anaphylactic sudden death diagnosis. Therefore, in the forensic armamentarium should be also added, together with the well established spleen and coronary artery

histological examination, the pericardial fluid carboxypeptidase A and histamine levels, accompanied with the quantification of histamine H4 receptor expression by pericardial mast cells and histamine releasing factor receptor at mRNA in pericardium

We entirely agree with Palmieri's view that the interpretation of biochemical results obtained by laboratory analyses performed in pericardial fluid during autopsy could be challenging due to the difficulty of incorporating a plethora of factors such as postmortem interval, decomposition changes, and chosen analytical technique for a specific analyte. It seems that the magic bullet in diagnosing the exact cause and especially the kind of sudden death is still ahead, but the implementation of molecular testing at protein or mRNA level could contribute in death cause elucidation and further anaphylactic death confirmation.

References

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Available online 6 November 2017