G37 Evaluation of Cardiac Conduction System Pathologies in Sudden Deaths in Adana Region

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The goal of this presentation is to encourage the forensic pathologists in evaluating the cardiac conduction tissues in sudden death cases.

This presentation will impact the forensic science community by presenting the microscopical findings of the cardiac conduction tissues in sudden cardiac death cases.

A forensic pathologist is frequently asked to find the cause of death in cases of sudden unexpected deaths in adults. Approximately 50% of all medico–legal deaths are due to natural causes. Approximately 1-5% of all those cases remain as negative autopsies. Sudden cardiac death is usually defined as death from cardiac causes without apparent antecedent symptoms or within the first hour after onset of symptoms. Studies of morbidity and mortality related to cardiac disease estimate that there are between 300,000 and 400,000 sudden cardiac deaths annually in the United States. On the other hand, Turkey does not have a serial study of cardiac diseases as autopsy findings. Therefore, this preliminary study was planned. Examination of the cardiac conduction system is often looked upon as a last resort in the evaluation of a victim of sudden death. It is reasonable to conclude, then, that unfamiliarity with conduction system anatomy and pathology and lack of experience with the examination techniques are the true reasons for this reluctance, which is not surprising because many anatomic pathology and forensic medicine residents complete their training without learning about the cardiac conduction system. This lack of training is symptomatic of the ongoing decline of the autopsy as a teaching tool. Careful case selection for conduction system analysis, coupled with a sensible approach to dissection and histological sampling, will result in an increased yield of diagnostically specific, potentially lethal lesions with only a minimal increase in the expenditure of time or money.

Twenty-seven SUD and four known cause of death forensic cases had been chosen for this study. The autopsies held in the Morgue of the Adana Branch of the Turkish Forensic Medicine Council. The cardiac tissue and coronary artery samples were dissected as described by the CAP and the Cardiac Conduction System examined as already has been described by Cohle et al and Gulino Sam. Harris' H+E, Masson's Trichrome, Verhoeff's elastic Van Gieson and also for amiloidosis, Lieb's Crystal Violet stains had been used histochemicaly.

The 31 autopsy cases differed in age from age of 17 to 78 years with an average 41.7. Fifteen cases had serious atherosclerotic changes in the coronaries. In 13 cases there were infarctions. In this study cardiac conduction tissue pathologies in the 11 was revealed.

Serious fibrotic and remarkable adipose tissue changes in the SA and AV nodes were found. Many of the similar studies show parallel results with this study. The difference in between these serials can be explained by the difference of the countries, socio–cultural specifics, life conditions, environment, nutrition, and genetic variations. Hypoxic changes of the myocardial tissue may also cause conduction system pathologies. Myocardial infarctions were present in four of the SA nodes and two of the AV nodes of all cases. This is an important finding to understand and reveal the conduction system effects of the early and late myocardial infarctions. Amyloidosis was not found case in this serial. Any significant pathologic changes in any of the control cases was not noticed. In some of the SUD cases, the pathology is not morphological yet functional. Yet, still in some cardiac rhythm disturbances cases, some may find cardiac conduction tissue pathology histologicaly. The relationships between cardiac conduction tissue morphological pathologies and cardiac rhythm disturbances will only be demonstrated clearly by clinico-pathologic evaluations with in large serial studies.

Further study is needed of the cardiac conduction tissue on larger SUD serials, and to understand the pathologies and mechanisms of deaths in especially young SUD cases at our region and country. The findings in this model study are very important in demonstrating the young SUD cases and its relation with the conduction tissue pathologies. Therefore, examination of the cardiac conduction system can be a very useful adjunct to the examination of the heart in cases of sudden cardiac death especially in our region. Careful case selection, proper technique, and mindfulness of nonspecific findings or normal variants increase the likelihood of identifying abnormalities that may serve as the morphologic substrate for sudden cardiac death.

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