G56 Degenerative Changes of the Conduction Tissue in Drug Addicts

Michaud Katarzyna, MD, Béat Horisberger, MD, and Patrice Mangin, PhD, Institut Universitaire de Médecine Légale, Rue du Bugnon 21, Lausanne, Vaud 1005, Switzerland*

After attending this presentation, attendees will possibility of the influence of the degenerative findings in the cardiac conduction system in the pathophysiology of the death in chronic drug abusers.

This presentation will impact the forensic community and/or humanity by showing that degenerative changes of the cardiac conduction system are more often observed in drug addicts than in the control group.

The destructive effects of some drugs and especially of cocaine on the cardiovascular system are well known. The aim of this study was to evaluate if the degenerative changes concern also the cardiac conduction system and if these changes are more frequently observed in drug addicts.

The material included fatalities studied at the University Institute of Forensic Medicine in Lausanne for the period 1998-2001. The age of the patient ranged from 21 to 47 years (mean 32.4) for the drug addicts and from 21 to 50 in the control group (mean 32.5). In the group of the drug addicts we included 51 cases, all of them known by the police as drug users. Complete autopsy with histological examination were available for each case, and toxicological analyses in 50 cases. The toxicological analyses demonstrated the presence of one or more drugs in the blood in 43 cases, from which in 20 cases 3 or more drugs; cocaine or its metabolites were present in 18 cases. In the control group were included 52 cases not known as drug abuser. Complete autopsy with histological examination were available for each case and toxicological analyses in 40 cases. From 7 cases of intoxication which were included in this group, 4 were suicides by psychotropic drugs, one suicide by cyanide ingestion and 2 were consecutive to accidental monoxide intoxication. In 22 cases the toxicological analyses were negative. In 11 cases the therapeutic levels of different antidepressants were found. Cocaine or its metabolites were found in no case.

The degree of fibrosis and fatty infiltrations has been analysed using the semi-quantitative score evaluation. The changes were analysed in the following structures: the atrioventricular node (NAV), the penetrating part of the node (PB), the branching bundle (BB), the left and right branches (LBB and RBB) as well as the left and right part of the septum superior.

The mean scores for the degenerative changes were higher in the addicts group. The statistical analyses showed significant differences ($p<0.01$) for fibrosis in the atrioventricular node, in the penetrating part, in the left bundle branch, and in the septum superior as well as for fatty infiltration in the branching bundle and in the left bundle branch. No significant differences were found between the results in the group of cocaine-positive drug users and the results in the drug users without cocaine found in toxicological analyses.

The more frequent apparition of degenerative changes in the group of drug addicts, which are often cocaine users, can be explained by cardiotoxic effect of a chronic drug administration. On the other hand, it is evident that the pathomechanism of deaths in drug intoxication is multifactor, and that interpretation of deaths by overdose can be difficult because the range of drug concentration in fatal cases can be very large. Therefore, the possibility of the influence of the degenerative findings in the conduction system and in the septum superior in the pathophysiology of the death in chronic drug abusers should also be considered. Moreover, in some deaths pathological changes may be associated with the electrical instability of the heart and even contribute to the death, in particular in some unexplained cases of sudden death.

Drug Addiction, Heart, Conduction System

 ** Presenting Author*