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PATHOLOGY AND APOPTOSIS OF THE CARDIAC CONDUCTION SYSTEM IN 100 VICTIMS OF SUDDEN INFANT DEATH SYNDROME (SIDS)

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Objectives The aim of this study is to determine the presence and possible significance of morphological changes and apoptosis in the cardiac conduction system in SIDS. Background Both the morphological and functional derangement of the cardiac conduction system underlying the SIDS remain poorly understood. Methods We analyze 100 cases of SIDS, ranging in age from 3 to 365 days, and 24 age-matched control infants (ED, explained death). The cardiac conduction system was removed in two blocks: the first included the sino-atrial node and the crista terminalis, the second contained the atrio-ventricular node, His bundle, bifurcation, and bundle branches. The histological examination was performed on serial sections, using in situ endolabeling of fragmented DNA (TUNEL). Results The following findings were observed: resorptive degeneration (97% SIDS, 80% ED), His bundle dispersion (33% SIDS, 17% ED), Mahaim fibers (23% SIDS, 8% ED), cartilaginous meta-hyperplasia (6% SIDS, 4% ED), persistent fetal dispersion (25% SIDS, 17% ED), left sided His bundle (20% SIDS, 8% ED), hemorrhage of the atrio-ventricular junction (16% SIDS, 0% ED), septation of the bifurcation (13% SIDS, 0% ED), atrio-ventricular node dispersion (7% SIDS, 0% ED), sinus node hypoplasia (6% SIDS, 0% ED), Zahn node (3% SIDS, 0% ED), His bundle hypoplasia (5% SIDS, 0% ED), atrio-ventricular node dualism (3% SIDS, 0% ED). Conclusions All these findings have all been documented and discussed as morphological substrate for lethal arrhythmias in SIDS. The presence of accessory pathways can play an important role as pathogenic backgrounds of a significant number of cardio-arrhythmogenic SIDS.