

SHOULD OVERDONE EXTERNAL CARDIAC MASSAGE IN INFANTS DYING OF SIDS BE DISCOURAGED?

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A risk of cardiac injury during external cardiac massage, consisting of intramyocardial and cardiac conduction system hemorrhages has been reported. While external cardiac massage is advocated in all sudden infant death syndrome (SIDS) cases, little attention has been given to the possibility of lesions of the heart and cardiac conduction system during this emergency maneuver. A 3-month-old boy with no known history of medical problems was found unconscious while lying in a pram pushed by his parents. The baby had been taken to the hospital where external cardiac massage was performed for a total of 90 minutes in two successive bouts. Sixteen hours from the start of resuscitation attempts, the heart resumed sporadic beating (aided by sporadic emergency maneuvers) for a few hours with EKG finding of right branch block and downsloping of the ST segment, but no clear-cut sign of ischemia. The baby remained persistently unconscious and was pronounced dead 26 hours after hospitalization. Postmortem histological examination confirmed the clinical suspect of SIDS. Histological observations were focused on the cardiac specialized system and the cardio-respiratory centers in the brainstem, as previously devised by the present authors. 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 down to bifurcation and bundle branches. These two blocks were cut serially at intervals of 40-mm (levels) and stained alternately with hematoxylin-eosin and trichromic Heidenhain. Transversal serial 5-mm sections were made through the entire pons and medulla oblongata and were stained using alternately hematoxylin-eosin, Bielschowsky, and Klüver-Barrera stains. The pertinent nuclei were outlined, namely the arcuate nucleus, the parabrachial/Kölliker-Fuse complex in the pons, the nucleus hypoglossus, the dorsal vagus motor nucleus, the tractus solitarius nucleus, the nucleus ambiguus, the trigeminal tractus and nucleus, and the ventrolateral reticular formation in the medulla oblongata. The volume of the arcuate nucleus was measured by 3-dimensional reconstruction. At autopsy, the baby was described as a well-developed, well-nourished white infant. The external and internal examinations were entirely normal for the age and sex. The histological examination of the brainstem revealed a bilateral hypoplasia of the arcuate nucleus. The histological examination of the cardiac conduction system showed islands of conduction tissue in the central fibrous body, known as persistent fetal dispersion, and areas of resorptive degeneration in the AV node. In the right sino-atrial area and in the uppermost ventricular septum there was a wide myofibrillary injury, similar to the contraction band degeneration, seen in hyperacute infarction. Our case acquires an unique interest about the theoretical role the exaggerated cardiac massage might have played in the temporary survival and lethal outcome, in so far as a short run of heart beat was recorded 16 hours after the cardiac asystole at hospitalization. The query if such phenomenon bespeaks for or against overdone cardiac massage is wide open.

SIGNIFICANCE OF MAHAIM FIBERS IN CRIB DEATH

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ABSTRACT - Crib death remains poorly understood both morphologically and functionally. The cardiac hypotheses postulating that crib death is due to lethal cardiac electrical instability is gathering a renewed interest. Aim of this work is to examine the likely role of Mahaim fibers in relation to crib death. We analyze 72 autopsied cases of crib death (47 male and 26 female infants, ranging in age from 3 to 365 days) and 24 age-matched controls. Mahaim fibers were found in 21% of crib death and in 8% of control cases. Mahaim fibers are specialized accessory pathways connecting the atrio-ventricular junction and the upper ventricular septum. These fibers, under particular conditions and/or neurovegetative stimuli, may cause pre-excitation and potentially malignant arrhythmias. The whole atrio-ventricular system or its junctional tract, can become part of a classical destabilizing circuit. Their possible role in pathogenesis of crib death will be discussed.