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The Seventh

SIDS

Sudden Infant Death Syndrome

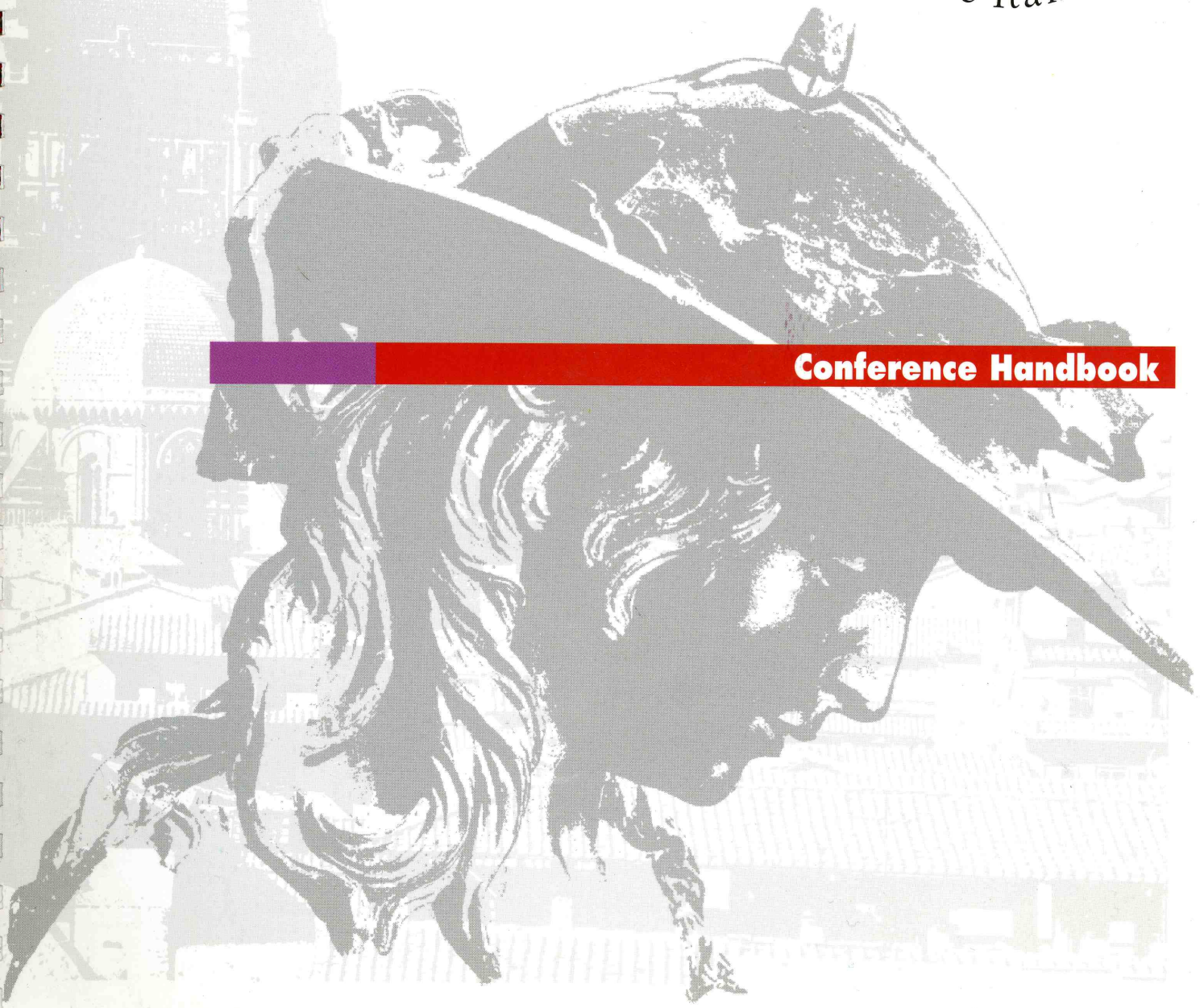
International Conference

Florence, Italy

August 31 - September 4

2002

International Conference
SIDS
Sudden Infant Death Syndrome
Firenze Italia 2002



Conference Handbook

Martin, and the Olszewski and Baxter atlas, agreements and discordances have emerged. On the basis of these considerations, we conclude that the autopsy protocol for the SIDS and stillborn victims, must include the examination of the autonomous nervous system according to the herein described guidelines, available at our web site: http://users.unimi.it/~pathol/sids/tecnica_e.html.

POSTNATAL APOPTOSIS OF THE CARDIAC CONDUCTION SYSTEM IN CRIB DEATH: PRELIMINARY RESULTS

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ABSTRACT - The cardiac theory that crib death may be related to lethal arrhythmias or heart block due to abnormalities of the conduction system is gathering a renewed interest. The aim of this study is to determine the presence and significance of apoptosis in the cardiac conduction system in the crib death. Postnatal morphogenesis of the human heart is an important part of its normal development. However, the nature of the postnatal changes in the cardiac conduction system and its relation to crib death is not yet fully explained. The cells protruding from the atrio-ventricular node and His bundle are undergoing cardiac molding, named resorptive degeneration. Such molding consists of degeneration, cell death and replacing in an orderly programmed way. Apoptosis, with its unpredictable but rapid occurrence, could play a role in the pathogenesis of crib death. Such process, if defective, could leave in place some accessory communication between the atrio-ventricular pathway and the adjacent ordinary myocardium. We analyze several hearts from autopsied crib death cases and from age-matched controls. 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, and bundle branches. Histological examination of the cardiac conduction system was performed on serial sections, using in situ endolabeling of fragmented DNA (TUNEL) method. Apoptosis of the cardiac conduction system is discussed as a process favoring lethal electrical instability.

STUDY OF THE CYTOARCHITECTURE OF THE PARABRACHIAL/KOLLIKER-FUSE COMPLEX IN SIDS AND FETAL LATE STILLBIRTH

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ABSTRACT - The parabrachial / Kölliker-Fuse (PB/KF) complex has been defined in different animal species as lying in the dorsolateral part of the pontine tegmentum and subdivided into three well defined regions: the medial parabrachial nucleus (mPBn), the lateral parabrachial nucleus (lPBn), and the Kölliker-Fuse nucleus (KFn). Experimental studies have demonstrated that the PB/KF complex is involved in a variety of functional activities and plays an important role in the respiratory activity.

In man, the impossibility of using experimental approaches, makes it difficult to characterize the cytoarchitecture and the physiology of these structures. Only a few studies have provided morphological data regarding the human PB complex, but these observations are imprecise and conflicting.

The aim of the present study was to examine a large sample of human brainstems in order to define the precise morphology of the mPB, lPB and KF nuclei and to determine whether these centers show morphologic alterations in SIDS and fetal late stillbirth, whose etiopathogenesis is still unknown.

In serial sections of 24 human brainstems of subjects aged from 32 gestational weeks and one year (from 6 stillbirths, 7 SIDS cases, and 11 infants with defined cause of death) we studied by morphologic and morphometric analyses the cytoarchitecture and the extension of the PB/KF complex.

We observed that its morphology is homogeneous in all cases; therefore we defined the precise structure of the three nuclei. The features of the lPBn and of the mPBn are largely consistent with those reported in experimental studies.

The lPBn in transverse sections is located between the lateral surface of the pcs and the lateral lemniscus. It extends vertically from the level of the pons-mesencephalon junction (cranial pole) to the level where the lateral lemniscus nucleus is clearly visible (caudal pole). The size of the lPBn decreases from cranial to caudal pole. The neurons are round or tapering, with a light, often central nucleus, prominent nucleolus and scarse cytoplasm.

The mPBn lies medially to the pcs in transverse sections, between the motor nucleus nervi trigemini and the locus ceruleus up to the ventral termination of the pcs. Longitudinally its size does not change from the rostral pole (pons-mesencephalon junction) to the caudal pole (where the lateral lemniscus nucleus is clearly visible). It contains numerous oval and polygonal neurons, which are usually larger than the lPB neurons and have darker and more evident cytoplasm.

Instead, we found some morphologic differences between the KFn in man and those of other animal species, to wit: 1) It has a lesser degree of definition and circumscription: 2) as appreciated in transverse sections, it is made up of an area of clustered neurons (subnucleus compactus) and an adjacent area with dispersed neurons (subnucleus dissipatus); 3) It is not restricted to the cranial portion of the pons, but also detectable in the caudal tract of the mesencephalon.

On the basis of these observations, it can be concluded that the KFn appears to be more developed in man than in other animal species, and that it shows a more extended and complex structure, with connections to the mesencephalon.

We plan to examine an even wider sample of cases in order to confirm our observations and to determine whether there are no morphologic differences in the parabrachial area of stillbirths and SIDS victims. We are also studying another nervous center (the gigantocellular nucleus) located in the caudal tract of the pons, which seems to be closely connected to the PB/KF complex in the control of respiratory activity, by inhibiting the interruption of inspiration.
