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Abstracts of the 10th International Symposium Advances in Legal Medicine combined with the 96th Annual Conference German Society of Legal Medicine

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the effects of heat stress on the electrical conductance and the contribution of which proteins in the effects in cultured neonatal rat cardiomyocytes.

Material and methods. Eight weeks-old male rats are put into an incubator and heated at 37°C or 42°C for 1 hour, and the protein expression in the rat heart was examined by western blotting and immunofluorescent staining. Furthermore, for in vitro study, cardiomyocytes were obtained from the ventricles of 1 to 2 day-old Wistar rats. The primary cardiomyocyte culture were loaded under 42°C for 6 hours, and then cell injury was estimated by LDH assay for supernatant, mRNA expression was done by real-time RT-PCR, protein expression was done by western blotting, and extracellular field potentials (FP) was done by the MED64 system (Alphamed, inc.).

Results. The expression of connexin43 (Cx43) protein was significantly increased in the heart in vivo, especially in the adluminal left ventricle. On the other hand, there was no change in lactate dehydrogenase level, a marker of cellular toxicity, in the primary cardiomyocyte culture medium. The expression of mRNA and protein of Cx43 in the cardiomyocytes were significantly increased by heat loading, which phenomenon was inhibited by 9-Phenanthroline, a TRPM4 antagonist. Furthermore, extracellular field potentials (FP) in cultured cardiomyocytes were changed by heat stress.

Discussion and conclusions. Heat stress induced the expression of Cx43 protein in the rat heart. In the primary cardiomyocyte culture, the expression of Cx43 mRNA and protein was increased by heat loading at 42°C for 3 and 6 hours. The increase could be inhibited by a TRPM4 blocker. Furthermore, heat stress altered FPs pattern in the cardiomyocyte cultured at 42°C for 3 hours. These results show one possibility of pathogenesis of death by heat stroke.

In conclusion, the change of Cx43 expression by heat stress contributes to the development of arrhythmias. The mechanism may occur via activation of TRPM4.

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Prevention of stroke-related death: an experimental study on one protective mechanism of oxytocin for injured neurons in the rat stroke model

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Background. Recently, stroke is one of major disease with poor prognosis as death in the aged society all over the world. Oxytocin is a nonapeptide produced in the paraventricular nucleus of the hypothalamus, which stimulates the oxytocin receptor (OXTR) to initiate milk ejection reflex and parturition. Oxytocin administration has alleviated tissue damage in a variety of animal models about organ injury including cerebral infarction. However, the action mechanism of oxytocin in the cerebral infarction remains unclear. In the present study, we evaluated the spatial and time-dependent changes of OXTR expression in the brain of the rat stroke model.

Material and methods. Adult male Wistar rats (7–8 weeks old) were subjected to transient (90 min) right middle cerebral artery occlusion (tMCAO). The experiments were performed at 0.25, 1, 2, 3, 5 and 7 days post-reperfusion (dpr) after tMCAO. The expression of OXTR mRNA was detected by quantitative real-time RT-PCR and in situ hybridization.

Results. OXTR mRNA expression peaked at 1 dpr in the peri-infarct tissue. Additionally, in situ hybridization analyses of rat ischemic brain at 1 dpr showed upregulation of OXTR mRNAs in the right cerebrum without ischemic core, especially in the cingulate cortex.

Discussion and conclusions. Oxytocin has been known to be protective to organ damage. One-dpr expression of OXTR mRNA in this study may be critical for better prognosis following stroke to rescue damaged cells in this region during the subacute phase, leading to be the most effective to treat oxytocin within 1 day of stroke onset.

In conclusion, OXTR mRNAs were upregulated in the right cerebrum without ischemic core, especially in the cingulate cortex of rat ischemic brain at 1dpr.

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Sudden infant death in which patent ductus arteriosus was suspected to involve: Three autopsy case reports

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Background. We encountered three autopsy cases of sudden infant death in which patent ductus arteriosus (PDA) was suspected to involve.

Material and methods. Case 1 was a 16-day-old male infant with normal birth and development, who caught a cold and completely recovered. Five days after catching the cold, several hours after a night cry, he was found apneic and unresponsive. Case 2 was a 7-week-old female infant who was born by vacuum extraction without other remarkable growth history. She was also found unresponsive, several hours after taking milk as usual. Case 3 was a 9-week-old female infant with normal birth and development. She was found unresponsive in a prone position, several hours after she was confirmed that sleeping in a semiprone position.

Results. In all cases, PDAs were recognized on autopsy, which had been asymptomatic and clinically undiagnosed (silent PDA). In case 1 and 2, because the lungs showed a tendency to sink in a hydrostatic lung test and inflammatory changes such as lymphocytic infiltration mainly into the bronchioles was evident on histopathological examination, we diagnosed bronchial pneumonia as the direct cause of death. In case 3, because she was found in a prone position and mild abrasion was observed around her mouth and nose, we estimated that smothering was the direct cause of death. However, the lesions and injuries of these three cases were relatively mild. In case 1 and 2, changes of the lung lesions were considered too mild to fully account for the speed and prime cause of death, and reactions to respiratory syncytial virus (RSV) tests were faint. In case 3, lungs showed extensive congestion, but no significant congestion in other organs and no petechiae were found.

Discussion and conclusions. Therefore, we concluded that persistent cardiac load or some kind of circulatory stress from the comorbid PDA was eventually involved in the process of sudden death in these cases. PDA is a rather common cardiovascular malformation, and numbers of infants with PDA may develop normally. Since detection of PDA has been difficult, especially in asymptomatic case, and even silent PDA can lead to sudden infant death with complications such as RSV infection or occlusion of mouth and nose, we emphasize the importance of paying attention to the probability of undiagnosed PDA in forensic autopsy on sudden infant death cases.

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Case Reports of fatal juvenile delinquency in a school

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Background. Yogyakarta is known as a peaceful city with longest life expectancy in Indonesia. It is also known as a student city, where many students from around the country stay in Yogyakarta for their study. However, recently, juvenile delinquency in Yogyakarta became a serious problem, and disturbing the public. At the night, a group of students bring sharp weapon, riding motor cycle around the city, and suddenly attack the victims which also riding motor cycle. But the most shocked the people of Yogyakarta, is the violence during school extracurricular activity with several injured and death of three students. This paper aimed to report fatal cases of juve-