MORPHOLOGICAL CHANGES IN FETAL KIDNEYS DEAD IN THE ANTENATAL PERIOD

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https://doi.org/10.5281/zenodo.14212480

Abstract: Purpose of the study Forensic medical assessment of antenatal infant mortality.

Materials and methods. During the study, 72 forensic medical examination reports on the establishment of antenatal fetal death were analyzed.

Results. One of the characteristic aspects of child death in the antenatal period is the development of any processes leading to fetoplacental insufficiency and the prevalence of infant hypoxia. Forensic medical assessment of antenatal infant mortality, revealing the essence of the mechanism of thanatogenesis, predicting severe complications and reducing mortality indicate the relevance of the problem. It is characterized by a clear manifestation of morphological signs of renal tissue.

Conclusions. Morphological changes in the kidney tissue of children who died in the antenatal period are directly related to premature or premature birth, as well as to the early or late neonatal period.

Keywords: morphology, antenatal mortality, renal failure, morphological growth retardation.

МОРФОЛОГИЧЕСКИЕ ИЗМЕНЕНИЯ В ПОЧКАХ ПЛОДА, ПОГИБШИХ В АНТЕНАТАЛЬНОМ ПЕРИОДЕ

Аннотация: Цель работы. Судебно-медицинская оценка антенатальной детской смертности.

Материалы и методы. В ходе исследования проанализировано 72 акта судебно-медицинской экспертизы об установлении антенатальной гибели плода.

Результаты. Одной из характерных сторон детской смертности в антенатальном периоде является развитие каких-либо процессов, приводящих к фетоплацентарной недостаточности, и распространенность гипоксии младенцев. Судебно-медицинская оценка антенатальной детской смертности, раскрывающая сущность механизма танатогенеза, прогнозирующая тяжелые осложнения и снижающая летальность, свидетельствует об актуальности проблемы. Она характеризуется четкой выраженностью морфологических признаков почечной ткани.

Выводы. Морфологические изменения почечной ткани детей, умерших в антенатальном периоде, напрямую связаны с преждевременными или недоношенными родами, а также с ранним или поздним неонатальным периодом**.**

Ключевые слова: морфология, антенатальная смертность, почечная недостаточность, морфологическая задержка роста**.**

INTRODUCTION.

The high level of maternal and child mortality in the world at present, in developing countries, is characterized by the fact that the stages of primary diagnosis and treatment are not fully implemented [1,2,3]. This is manifested by severe complications of pathologies in the perinatal period, the absence of specific practical recommendations for their elimination, partial

treatment at the stages of the tanogenesis process. For example, in the USA and Europe, the mortality rate in premature births due to perinatal pathology is 6-8 per 1000 births, in the Russian Federation - 8-12, and in the CIS countries and Central Asia this figure is 30-6 [4,5]. In our country, infant mortality from perinatal pathology in the antenatal period averages 60-62 per 1000 births, which is due to the fact that when assessing forensic aspects, determining the mechanism of thanatogenesis, existing somatic diseases in the mother, infectious diseases in the early stages are not fully identified, and clinical and anamnestic data are not specified. This is considered important when assessing economic, political and medical reforms of any country, and according to BSST 2022, it is considered the main criterion for assessing demographic indicators [6,7,8,9].

MAIN PART

The study used catamnesis, macroscopic, forensic histological, forensic, quantitative, comparative and statistical methods. During the study, 72 forensic medical examination reports on the establishment of antenatal fetal death were analyzed.

In children who died antenatal, the kidney function is not fully developed, intrauterine infection initially causes damage to the respiratory organs and ultimately a number of morphological changes in the internal organs, including the occurrence of acute metabolism in the kidneys [9,10,11]. In the following morphological studies, the components that make up the main morphological substrates in the kidney tissue of noble children in the antenatal period are: a dense arrangement of not yet formed oval, elongated and pear-shaped balls in the kidney. cortex, mainly mesangial cells in a wonderful mesh structure, endothelial cells are incomplete, the angiogenesis processes in which are not fully formed, the presence of 1-3 balls on average in the field of view of 200x on the middle part of the cortex, in the control group this indicator is on average 12-14. It was determined that there are no traces of primary urine in the proximal and distal tubes (this indicator indicates incomplete recovery of renal function), interstitial edema persists in the interstitial stroma. In the mesentery, the contents of the distal tubules are empty and narrowed, the epithelial cells are small and flat, secondary traces of urine are not detected [12,13,14,15].

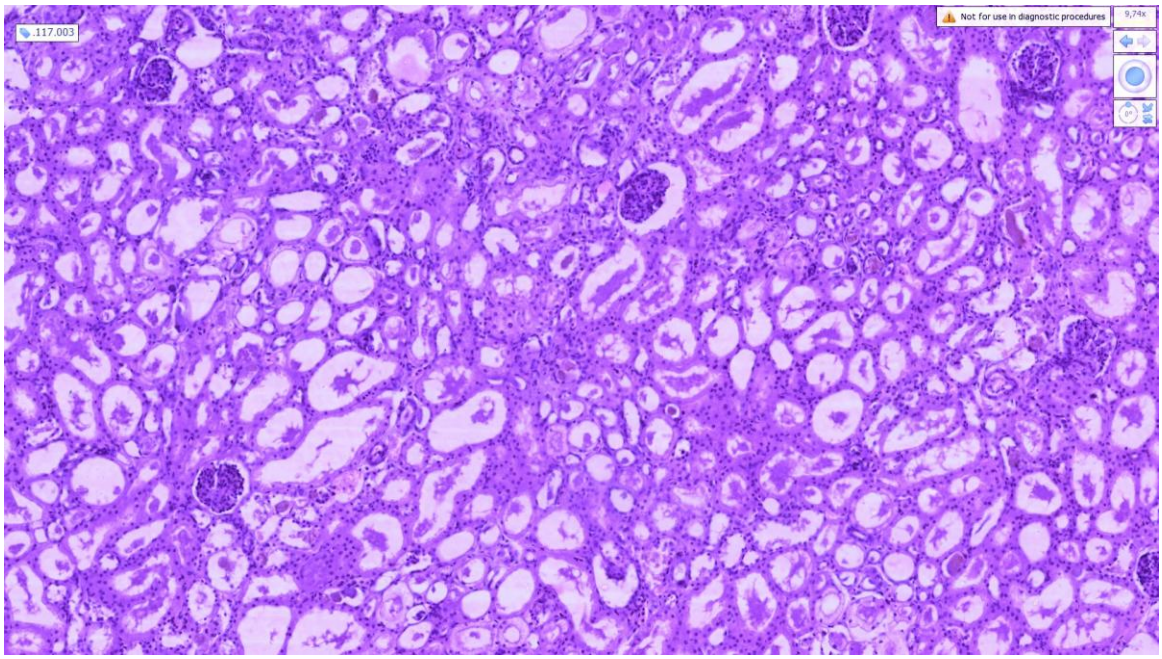

Figure 1. Cortical section of the kidney of a 34-week-old child with antenatal death. Report #57D. Bowman's cavity is sharply dilated, uneven filling is determined in the fine mesh, the

epithelium of the proximal tubules is uniform in appearance, nuclei are determined. G.E. dye. Size 40x10.

In the antenatal period, synchronous changes were detected in the renal cortex, proximal tubules and vessels. Different sizes of glomeruli are determined, not yet fully developed and formed, uneven filling of the vessels of the marvelous network of glomeruli, focal growths in the mesangial cells. Bowman's cavity is multilaterally dilated, the basal membrane thickens, deformation of the glomeruli continues. Darkening of the cytoplasm of the visceral epithelium of the glomerulus, the appearance of homogeneous pink inclusions with different protein habitus are determined. determine that the epithelium of the proximal tubules is slightly swollen, granular hyaline inclusions are formed in the cytoplasm, the nuclei are darkly stained. in the epithelium of the proximal tubules, the nuclei of most 3/2 of the cells are blurred, the cytoplasm is uniformly pink, small basophils are detected in place of the nucleus, in some cells the nuclei are swollen, swell and disintegrate into fragments.

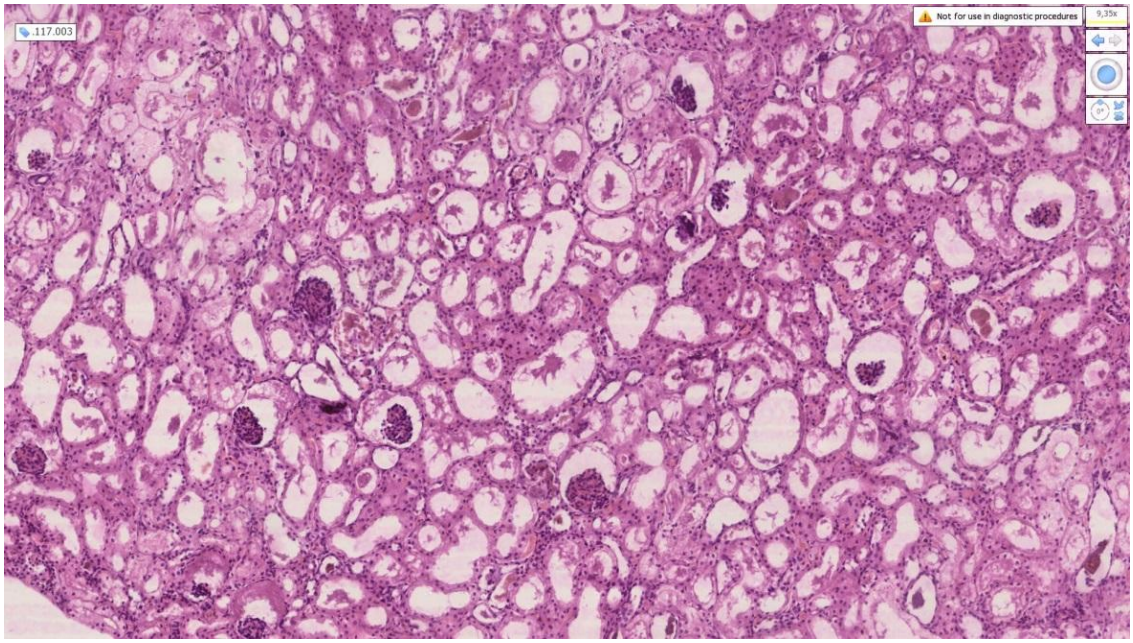

Figure 2. Cortical part of the kidney of a child who died in the antenatal period. Report No. 31D, a child of 33 weeks. Bowman's space was noticeably expanded (2), the epithelium of the distal tubules had a large number of nuclei, and most cells were anuclear (3). Paint G.E. Size 40x10.

As a result, the occurrence of a large number of necrotic foci in the epithelium of the proximal channel is determined. During histochemical examination, the following changes were revealed in the kidney tissue stained with Alcian blue. (See Figure 1).

The structures stained pink are neutral mucopolysaccharides and belong to a group of substances that should be present in the norm. Studies of the kidneys of children who died in the early neonatal period, studied in our study, show the accumulation of acidic mucopolysaccharides along the perimeter and spaces of the glomeruli. These morphological manifestations basically mean that the process of acute hypoxia is developing (see Fig. 2).

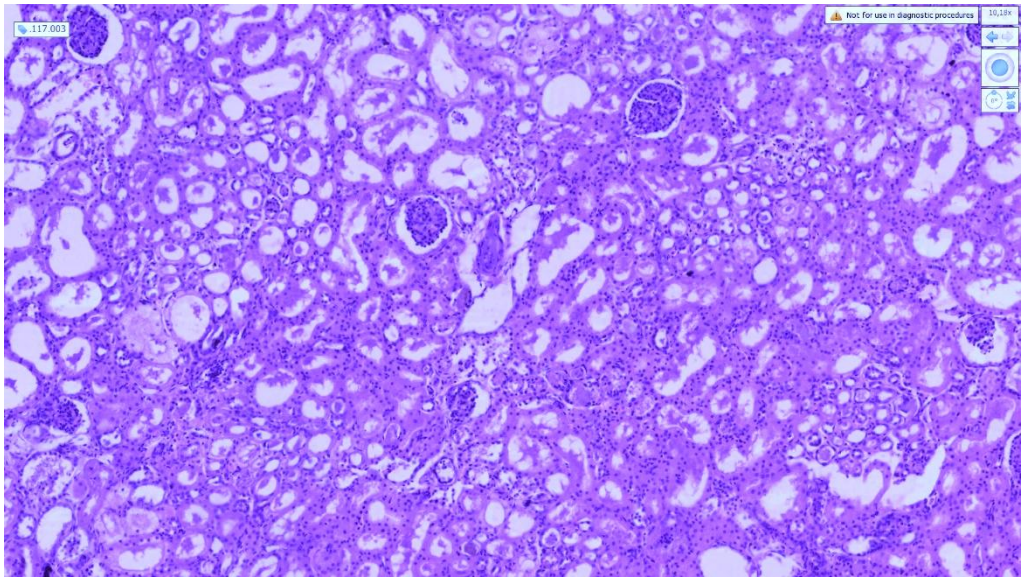

Figure 3. In the antenatal period, in the medulla of the kidney of a dead child, in the space of the distal tubules, a multitude of homogeneous protein-like structures are collected (2) Paint G.E. Size 4x10**.**

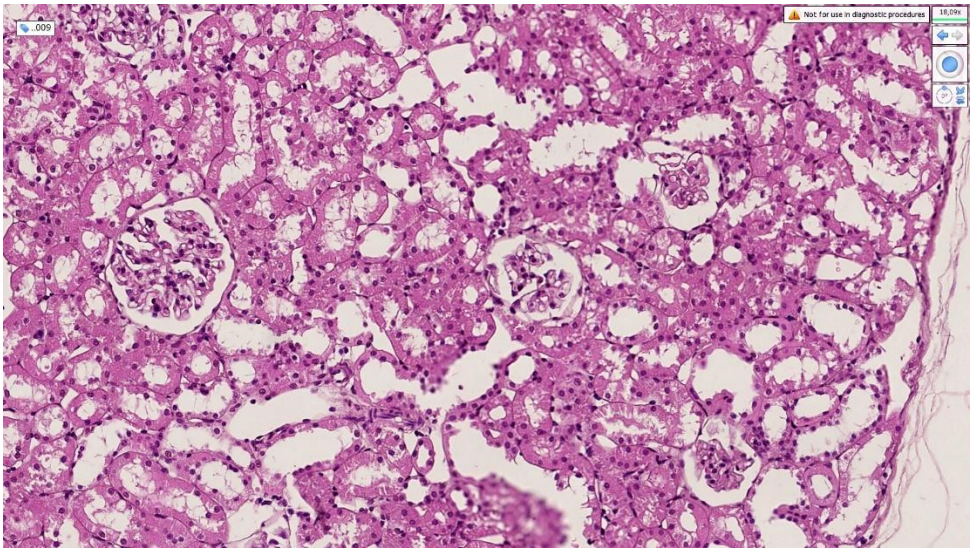

Figure 4. The cortex of the kidney of a child who died in the antenatal period. Report No. 43DI, a child of 38 weeks. In the epithelium of most proximal tubules, nuclei are not detected. Paint G.E. Size 40x10.

The accumulation of acidic mucopolysaccharides in the cytoplasm and pericellular areas of the epithelium of the proximal tubules indicates the development of acute hypoxia and multifocal coagulative necrosis of the epithelium of the proximal tubules. It was found that homogeneous mesh protein structures were found in the space of the proximal tubules, proteins in single urine formed during filtration were not reabsorbed, most of the epithelium of the proximal tubules was in a state of paranecrosis and necrobiosis. The sharp development of these changes was determined mainly in the early neonatal period. The development of the filling of remarkable mesh vessels of the glomeruli, the expansion of Bowman's space during forced filtration confirms the violation of the filtration index from the morphofunctional point of view.

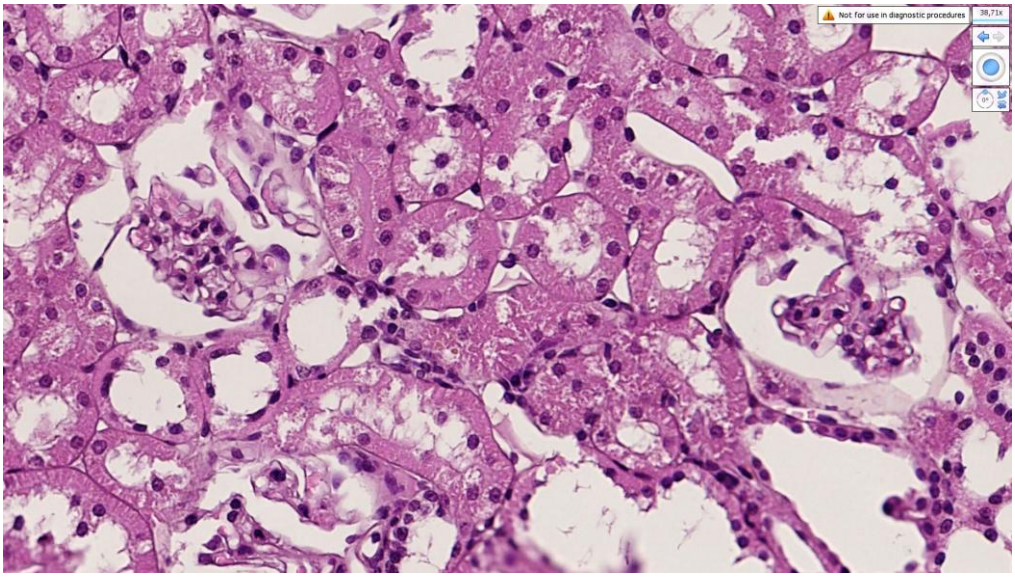

Fig. 5. The cortex of the uterus of a child in the prenatal and antenatal period. Report No. 47DI, the child is 39 weeks old. In the globular type, this picture confirms the delay in the development of a large vessel of the retina (1), a concentrated focus of SchIFF-positive structures on the periphery of a large reticular vessel (2) and scanty edges in the epithelia of the proximal vessels of the retina. and distal canals (3). Alcian blue dye. Size 40x10.

It was established that signs of filling were preserved in the pericanalicular and paracanalicular vessels, and signs of filling - in the vessels of the arcuate veins on the border of the cork and medulla. This is the presence in the epithelium of the tubes in the development of branches of the full number of epithelial cells subject to necrobiosis, metabolic acidosis due to venous replenishment, acute toxic dystrophy of cells under the influence of intermediate metabolites, increased hypoxia (see Fig. . 3).

In the last weeks of the antenatal period, about 34-36 weeks, the relative development of internal organs in children, stabilization of reactions of adaptation to life and other reasons mean that the disease continues with a relatively milder course.

With antenatal intrauterine infection and birth pneumonia in developed pneumonia in children, it is shown that the developed aspiration syndrome continued with various development of predominantly dystrophic necrobiotic and discirculatory changes in the lung tissue.

In particular, it is characterized by the fact that the balls in development remain in size compared to the control group and are smaller in size compared to the control group. This is explained by the small size of the renal globules, the small number of parenchyma cells and the reduction of the surface of the morphofunctional areas.

In the antenatal period, the nutritional deficiency of the renal globules is confirmed, the continuing development of aspiration syndrome, the decrease in the number of podocytes of the visceral epithelium of the club and podocytes of the small mesh, since the endothelial cells remain parallel to the indicated ones. small vessels of the retina change and develop (see Fig. 4). These processes are explained by the fullness of the vessels and the delay in the development of the marvelous network of vessels. It was found that the thickness of the thick epithelium in the distal part of most glomeruli and the initial thick part of the proximal tubules is significantly reduced, homogeneous pink structures in the cytoplasm of the cells are sharply reduced, some nuclei are dark, most of them are light. This means that there is a metabolic disorder in the active areas of

the kidney, a decrease in functional indicators (see Fig. 5). Pale basophilic staining of the epithelial cytoplasm in the narrowed branches of the proximal tubules means that there are watery dystrophic changes and death of most cells. This proves that clinical signs indicating acute renal failure occur in children in the antenatal period as a direct and indirect cause of the development of the thanatogenesis process. In particular, in our studies, mainly in 31 cases, in the kidneys of children who died in the antenatal period, massive occurrence of cortical necrosis directly leads to death, while segmental necrotic necrosis plays an important role in the occurrence of multiple organ failure. indirectly leads to death. In this study, in our work, the main mechanism of tanogenesis in children who died in the antenatal period is the occurrence of fetoplacental insufficiency, fetal hypoxia, as a consequence of the violation of the interconnected integration in the tissues of the lungs and kidneys, insufficiency of the humoral system that controls vascular tone, sudden production of surfactant in the lungs due to a decrease and the occurrence of primary atelectasis under the influence of other factors leads to the death of children.

CONCLUSION

1. Morphological changes in the kidney tissue of children who died in the antenatal period are directly related to premature or preterm birth, as well as to the early or late neonatal period.

2. It has been proven that in the antenatal period, the number of nephrons in the kidneys of young children decreased compared to the control group, and in the late neonatal period, the diameter and volume of perivascular vessels around the most distal tubules increased by 1.35 times. times compared to the control group.

3. In children who died antenatal, a decrease in the area of the kidney bodies was noted due to ischemia and necrosis, the size of the diameter of the proximal tubules of the kidney, the degree of filling of the tubular space and the area decreased by an average of 1.4 times compared to the control group; an increase in nephrons was found;

4. Incomplete formation of renal tissue in the antenatal period and premature birth, somatic diseases in the mother, as a result of which metabolic acidosis is observed in the tubules, the amount of tubular epithelium decreases, vascular permeability increases, interstitial edema, vascular dilation in functionally active zones and protein content in the epithelium of tubules and tubules in the late neonatal period. It has been proven that with dystrophy, the kidney increases in size and mass due to the development of edema.

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