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Evaluation of Kidney Injury Development in Children with Sars-Cov-2 Illness

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Abstract: This article analyzes the course of kidney damage in children with SARS-CoV-2 disease and provides scientifically based suggestions and conclusions.

Keywords: Coronavirus, disease, children, kidney, treatment, inflammation.

2019 coronavirus infection (COVID-19) is an infectious disease caused by SARS-CoV-2, the severe acute respiratory syndrome coronavirus 2. The disease was first identified in Wuhan, China in 2019 and spread globally, causing the 2019–2020 coronavirus pandemic. The disease causes symptoms such as high temperature, cough and difficulty breathing. In some cases, muscle pain, phlegm, and sore throat are observed. Although most people infected with the virus develop mild symptoms, some patients develop severe pneumonia and multiple organ failure. Among diagnosed cases, the mortality rate is on average 3.4 percent. Among people under 20 years old, this indicator is 0.2 percent, among people over 80 years old it is 15 percent.

Relevance of the problem: Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is a new global public health problem that affects all organs, including the kidneys. Most of the reports on kidney status in the background of this infection have been conducted mainly among adults and elderly people, and such studies among children are rare [1-2].

The coronavirus SARS-CoV-2 has turned into a life-threatening pandemic disease - Covid-19. It is known that the main manifestations of this disease are acute respiratory distress syndrome and diffuse alveolar damage [9].

Although the main target of SARS-CoV-2 is the respiratory system, the virus can affect other organs in the body through the circulatory system. Initially, there was very little information about kidney damage. In the early stages of the pandemic, publications on kidney damage in SARS-CoV-2 were not systematic and characterized by clinical conditions ranging from mild proteinuria to progressive acute renal failure.

End-stage renal disease (ESRD), especially when it is associated with coronavirus infection, is a life-threatening condition. Currently, active research is being conducted on the differentiation of acute kidney injury from direct internal injury of the kidneys as a result of primary infection with COVID-19, and from MIS-C in children after infection with COVID-19, in which the clinical death of these two conditions is characteristics are consistent with each other [5,7]

At the site of inflammation, the simultaneous production and release of inflammatory mediators in immune cells, macrophages and intercellular matrix occurs, which constitutes one final result, which shapes all extracellular interactions. Fibroblasts are activated by the accumulation of stimulated immune cells and aggressive cytokines, local macrophages, and angiotensin-II in the interstitium. At this stage, cytokine growth factor produced by local macrophages or tubular cells itself is important [3,4].

It follows that stimulation of aggressive cytokines with the release of these cells, identified in a number of studies, is the main phenomenon in the damage of tubular cells in the formation of tubulointerstitial disorders, and determines their important role as local mediators. Thus, when detecting cytokines in urine, it is the most accurate method of studying PTIS, and when it is detected in

serum, it is used in complex diagnostic situations. Renal function should be monitored in all hospitalized patients with COVID-19 to avoid the use of nephrotoxic agents and the development of mechanisms that worsen renal function, such as hypovolemia [6, 8].

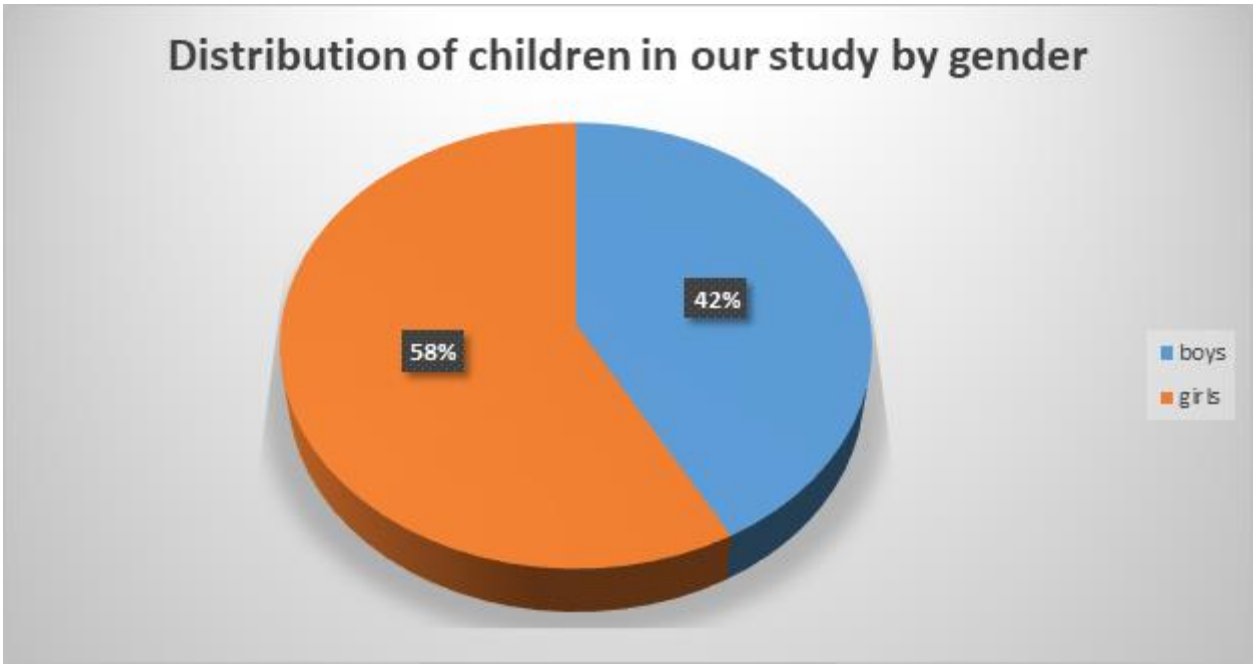
The purpose of the study is to evaluate the course of kidney damage in children with SARS-CoV-2 disease.

Research object and examination methods: In our study, 132 patients with tubulointerstitial kidney damage and Covid19, who were treated in the nephrology department of the Surkhandarya Regional Children's Multidisciplinary Medical Center (VBKTTM) during 2020-2023, were children.

Patients were divided into two groups, and each of them, in turn, was divided into two subgroups. The first group included children with acute pyelonephritis (n=65), where subgroup 1 consisted of 30 children without a history of Covid-19, and group 2 included children with acute pyelonephritis with Covid-19. There were 35 children. The second group included patients with acute tubulointerstitial nephritis (p=67), and they were also divided into two subgroups. An acute course of the pathological process was diagnosed in all patients (100%).

General clinic - anamnesis, examination, blood and urine analysis, excretory urography performed with the help of equipment, UTT examination of kidneys, nephroscintigraphy, measurement of arterial pressure, biochemical examination of creatinine in blood and urine, bacteriological examination of urine for microflora and sensitivity to antibiotics, statistical research methods were used.

Results of the study: Anemia in childhood and adolescence is the cause of the most common diseases in the structure of kidney diseases. This indicator was 55.4% (51 children) in the retrospective group. The pathology of primary kidney failure is widespread in epidemic zones, it was found in 40.3% (37) of children in this group.



The study found that abnormalities in serum cytokine profiles were more pronounced in patients with a history of Covid-19, which was associated with kidney inflammation, high vascular permeability, fluid loss, intra-abdominal hypertension, and subsequent associated with the presence of a cytokine attack in acute kidney pathologies caused by the resulting shock.

It should be noted that the concentration of IL-4 was almost seven times higher in children of the 1st subgroup compared to the control signs (almost three times in O'P), while in the children of the 2nd subgroup this indicator was 10 times higher. Concentration of IL-6 in urine was 60 times higher in children with Covid-19 background.

Conclusion. It is necessary to study the level of cytokines in urine in order to monitor the latent damage of tubular function (screening tests) in patients who have experienced Covid-19, and based on it, to determine the level of proliferative changes in the tubulointerstitial tissue of the kidneys and the risk of chronicity of the process. groups can be formed. In children with pulmonary symptoms of Covid-19, it is recommended to monitor the partial functions of the kidneys in the early diagnosis of diseases and in the treatment of their damage. It is necessary to carry out long-term monitoring in order to identify patients with latent renal pathology by distinguishing urinary syndrome in the active phase of the disease.

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