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# Clinical and Laboratory Changes in Children and Adolescents with Acute Kidney Injury after Peritoneal Dialysis in Bint Al-Huda Teaching Hospital, Thi-Qar, 2022-2023

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**Abstract:** Acute kidney damage (AKI) is a widespread complication affecting critically unwell and noncritically unwell children that affects one-third of children admitted to wards. We have experienced a better understanding of the consequences of pediatric AKI over the next decade, such as higher morbidity, hospital stay, time spent in the ventilator, and mortality. There are also more modern classifications, biomarkers, and risk factors to classify children hospitalized under the emergency, and research in the epidemiology of pediatric AKI. Although the principal mode of treatment of AKI in children historically is PD, the proportion of patients has declined considerably in adults following the introduction of pump-driven continuous renal replacement therapy (CRRT). PD costs less, is easier to administer, as well as it utilises less infrastructure as compared to extracorporeal interventions. It has the advantage of being the most convenient for patients with bleeding problems, as there is no need to involve a vascular access. It is also not as inflammatory and more physiological in comparison to extracorporeal treatments, and the fact that it is permanent is that the solute is eliminated progressively. Moreover, it has the potential of sustaining renal hemodynamics, and it generates hemodynamic tolerance. Nonetheless, acute Parkinson's disease (PD) is not only applied in countries that their resources do not allow more sophisticated medications due to numerous potential drawbacks. Compare clinical and lab outcomes of patients with pediatric patients after Parkinson's disease. A prospective research study was conducted between November 2022 and August 2023, where seventy kids in Bint Al-Huda Teaching Hospital took part in the research. A gender distribution (54.29% versus 45.71%) revealed that it was male-dominated. Septicemia was the most frequently occurring cause of AKI. Only 20 percent of the participants were ICU patients. The age, sex, and etiology of AKI of the individuals did not have any correlation with the 28.57% mortality rate. WBC, Hb, urea, creatinine, serum calcium, HCO3, and PH greatly improved as a result of dialysis (p-values < 0.001, < 0.001, < 0.001, < 0.001, and under 0.001). PD is a popular and alternative RRT technique in the pediatrics unit. APD is a simple, safe, and efficient means of renal replacement treatment in several conditions of childhood. It may also serve as the proper treatment of infants when necessary. Even though rare, complications may arise.

**Keywords:**. Aki, Acute Kidney Injury, Peritoneal Dialysis, Pd, Rrt.

## INTRODUCTION

The position of the kidneys is in the retroperitoneal area, directly over the umbilicus. Their length and weight range between 150 g and 12 cm in an adult to an approximate of 6 cm and 24 g of a full-term baby (Jetton, J. G. *et al.*, 2017). Their role is to eliminate the water, salt, and waste ions in the blood. The kidneys also secrete hormones in regulating the production of red blood cells, as well as the breakdown of vitamin D (Abdelraheem, M. *et al.*, 2014). They assist in the management of blood pressure and blood volume, also. The renal capsule is a tough fibrous capsule which encloses the kidneys. The renal capsule supplies the protection of the kidneys against injuries and infection (McGregor, T. L. *et al.*, 2016; Esezobor, C. I. *et al.*, 2014). The route comprises of the capillary basement membrane, the fenestrated capillary endothelium, and the visceral cell lining ( podocytes ) of the Bowman capsule in glomerular to Bowman space ultrafiltration (Ademola, A. D. *et al.*, 2012). Occupying the areas between the capillaries, mesangial cells are able to alter the surface area of the capillaries that may be subjected to filtration because of the nature of contractility (Raina, R. *et al.*, 2017). Blood comes into the glomerulus via the arteriole, and the filtered blood is released into the glomerulus via the efferent arteriole, which branches to form the peritubular capillaries (Guzzo, I. *et al.*, 2019). The hydrostatic pressure that is exerted across glomerary capillaries by the gradient between the high concentration of the plasma proteins inside the capillary and the plasma proteins nearly free ultrafiltrate in the space of





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Bowman is countered by the oncotic pressure which occurs in the space between the glomerary capillary and the ultrafiltrate in the space of Bowman, and is a passive mechanism that is regulated by the tone of the afferent and efferent arterioles. Also, its dependency is partly on the permeability of the glomerulus. The passage of water and filtration of blood by the kidneys relies heavily on the glomerular filtration. The glomerular filtration rate (GFR) is one of the main measures of nephrology.

The simplest way of determining the GFR is by measuring blood creatinine. The creatinine is generated all through by muscle cells and filtered by the kidneys. The tubular action dilutes, concentrates, and acidifies urine (Burgmaier, K. *et al.*, 2020; Stojanovic, V. D. *et al.*, 2017). With large changes in the arterial systemic pressure, renal blood flow, and GFR do not vary greatly. The autoregulation is meditated by tubuloglomeratic feedback. A high reduction in GFR in the ascending loop of Henle leads to excessive reabsorption of NA + and Cl-, resulting in a decrease in concentration of the same in the macula densa (Ao, X. *et al.*, 2018). This makes the juxtaglomerular cells produce more renin, and this makes angiotensin II to be more made in greater amounts, causing the narrowing of the efferent arterioles.

The GFR increases due to the elevation of the glomerular pressure and returns to normalcy. Acute renal failure or acute kidney injury (AKI) is a clinical disease when being unable to maintain a healthy balance of electrolytes and fluids a healthy reduction of renal functioning, which happens abruptly. The incidence of AKI is up to 8% in neonatal critical care units, and 2-3% in children admitted to tertiary care centers of pediatrics (Warady, B. A. *et al.*, 2012). The current definition of AKI is a reduction of urine volume to below 0.5 ml/kg/hr over a span of six hours or an increase in serum creatinine that has occurred after 0.3 ml/dl or higher and within a duration of four8 hours (Atkins, D. *et al.*, 2004). The estimates, depending on the incidence of AKI, are dependent on the population under study and the criteria used to discover cases. It is believed that AKI has between five and ten percent prevalence among hospitalized patients. It is suggested that 35% - 40% of patients with critically sick patients will progress to AKI, and 5% will progress to severe AKI, with renal replacement therapy being necessary (Flynn, J. T. 2002).

## PATIENTS AND METHODS

A prospective research was conducted on 70 patients of Bint Al-Huda Teaching Hospital in the southern Iraqi city of Al-Nasiriyah. Seventy children with AKI had to receive peritoneal dialysis. The altered paediatric RIFLE was used to classify acute kidney damage. All children younger than 15 years old, patients diagnosed with AKI (based on the modified pediatric RIFLE criteria) and eligible to receive peritoneal dialysis, as well as all three types of AKI (prerenal, renal, and postrenal), were considered suitable to enroll in the study. The information was given at the Bint Alhuda Specialist Teaching Hospital.

To conduct the biochemical tests, every subject was subjected to having three milliliters of blood removed through his/her veins using the disposable syringes. After clotting at room temperature, centrifugation of the blood into 3000 rpm was performed, resulting in total centrifugation taking 10 minutes. Subsequently, the serum was used to determine the kidney functionality, peripheral blood smears, and S. electrolyte. Moreover, to perform a blood gas analysis, every now and then, in an artery, one must take 2 ml of blood using a syringe and a small needle (to avoid blood clots), which has been heparinized.

The patient was lying in a supine position. Oxygen saturation monitors and resuscitation devices, which are attached to the patient. An assistant and standby equipment are used to maintain the airways of the patient. To empty the bladder, a urinary catheter is formed. The entire abdominal wall was cleansed with chlorhexidine—pediatric critical care unit. Peritoneal dialysis was conducted by means of a commercially available and disposable, semi-rigid, pediatric-size, PD catheter (SURU INTERNATIONAL PVT, LTD). The catheter tip is inserted into the pelvis above the symphysis pubis by locating a point on the skin at the midpoint or on each flank. The PD catheter was inserted, and a cannula (usually, 18 Fr) was inserted into the skin, the subcutaneous tissue, and the peritoneum (at the abovementioned location). Following the drawing of the needle, the plastic cannula was retained. Instilled crystalloid solution between 20 and 40 ml/kg in the belly until it was swollen, artificial ascites had been generated.

Then, the catheter was percutaneously inserted under a local anesthetic with a trocar and connected to the PD set via bags of PD fluid by



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following the strictest aseptic practices. PD fluid (510 ml/kg) should be used to test both fluid filling and non-leakage of drainage throughout the first 1-2 cycles. To reduce fluid leakage, a deep subcutaneous purse-string suture is normally placed in the area surrounding the PD catheter point of entry into the peritoneal cavity. Blood urea and serum creatinine were done after a total of 40-60 cycles lasting 45-60 minutes (24 cycles per day) to monitor the restoration of renal function.

In this study, the DIANEAL PD4 FDPB9403 dialysate of the Baxter Company was used. A dynamic monitor was utilized during PD to provide clinical observation of the heart rate, blood pressure, saturation of oxygen, and continuous electrocardiography. In addition to urine output, the biochemical indicators, arterial blood gases, blood urea, serum creatinine, and electrolytes were evaluated.

All the patients verbally signed their informed consent to participate in the study before any data was collected. The current experiment was given the green light by the Iraqi Scientific Council of Medical Specializations and officially approved, and the methodology of the study was evaluated. The data were interrupted using the SPSS version 25.0 software, and the frequency, percentage, mean, and standard deviation were used in explaining the data. Graphs were used in the presentation of data. Independent t test was applied to evaluate the mean difference of two quantitative variables, whereas the chi-square test was applied to evaluate the relationship between qualitative variables. Two t-tests were used to compare two situations of the same variable; a P value of less than 0.05 was taken to be significant.

## RESULTS

This study included 70 children and adolescents with acute kidney injury. 38, 54.29 %, of patients in this study were males, and (32, 45.71%) were females, with a male-to-female ratio of 1.18: 1.

**Table 1.** The demographic data of the included patients (gender and age group).

| Variables | Sex | No. | % |
|---|---|---|---|
| Gender | Male | 38 | 54.29 |
| | Female | 32 | 45.71 |
| Total | | 70 | 100 |
| Age group | Neonate | 25 | 35.7 |
| | Infant | 19 | 27.14 |
| | 1 – 5 years | 10 | 14.3 |
| | Older than 5 years | 16 | 22.85 |
| Total | | 70 | 100 |

The cause of dialysis in the study was septicemia in 40% of patients, acute gastroenteritis (AGE) in 22.8% of patients, obstructive uropathy in 15.7%, diabetic ketoacidosis DKA in 10.2%, hemolytic uremic syndrome (HUS) in 7.1%, acute glomerulonephritis (AGN) in 4.2%, and PIGN in 1.4%. The mean of disease duration was 4.10 ± 1.77, as presented in Table 2.

**Table 2:** Distribution of causes of AKI in included patients.

| Causes of AKI | No. | % |
|---|---|---|
| AGE | 16 | 22.8 |
| AGN | 3 | 4.2 |
| DKA | 6 | 10.2 |
| HUS | 5 | 7.1 |
| Obstructive uropathy | 11 | 15.7 |
| septicemia | 28 | 40.0 |
| Disease duration mean ± SD (SE) | 4.10 ± 1.77 (0.21) | |

Regarding past medical history, 87.1% of patients were free of any previous disease. 11.1% had bilateral renal stone, 77.8% had DM, and 11.1% had neurogenic bladder. In the history of congenital renal disease, only 2.9% of patients were positive, as presented in Table 3.





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**Table 3:** Past medical history and History of congenital renal disease of included patients.

| | | No. | % |
|---|---|---|---|
| Past medical history | -ve PMHx | 61 | 87.1 |
| | +ve PMHx | 9 | 12.9 |
| Type of disease | Bilateral stone | 1 | 11.1 |
| | DM | 7 | 77.8 |
| | Neurogenic bladder | 1 | 11.1 |
| History of congenital renal disease | Negative | 68 | 97.1 |
| | positive | 2 | 2.9 |
| Total | | 70 | 100 |

The source of patients was from the ICU in 20%, the indication of dialysis was severe metabolic acidosis in 61.4% of patients, anuria in 18.6%, uremic encephalopathy in 12.9%, and pulmonary edema in 7.1%. The presentation of patients was acidosis in all patients, DLOC in 84.3%, oliguria in 57.1%, dehydration in 30%, and fluid overload in 15.7%. The mean of dialysis duration was 3.34 ± 1.98 days, as presented in Table 4.

**Table 4:** Source of patients, Indication and duration of dialysis, and the presentation of patients.

| | | NO. | % |
|---|---|---|---|
| Source of referral | ICU | 14 | 20 |
| | Refer from the central hospital | 8 | 11.4 |
| | referral from the peripheral hospital | 34 | 48.6 |
| | Referral from a private hospital | 14 | 20 |
| Total | | 70 | 100 |
| Indication of dialysis | Anuria | 13 | 18.6 |
| | pulmonary edema | 5 | 7.1 |
| | Severe metabolic acidosis | 43 | 61.4 |
| | Uremic encephalopathy | 9 | 12.9 |
| Total | | 70 | 100 |
| Presentation | oliguria | 40 | 57.1 |
| | Acidosis | 70 | 100 |
| | Fluid overload | 11 | 15.7 |
| | Dehydration | 21 | 30 |
| | DLOC | 59 | 84.3 |
| Duration of dialysis mean ± SD (SE) | | 3.34 ± 1.98 (0.23) | |

**Table 5:** Outcome of patients included in this study.

| Patient outcome | No. | % |
|---|---|---|
| Improved | 50 | 71.43 |
| Died | 20 | 28.57 |
| Total | 70 | 100 |





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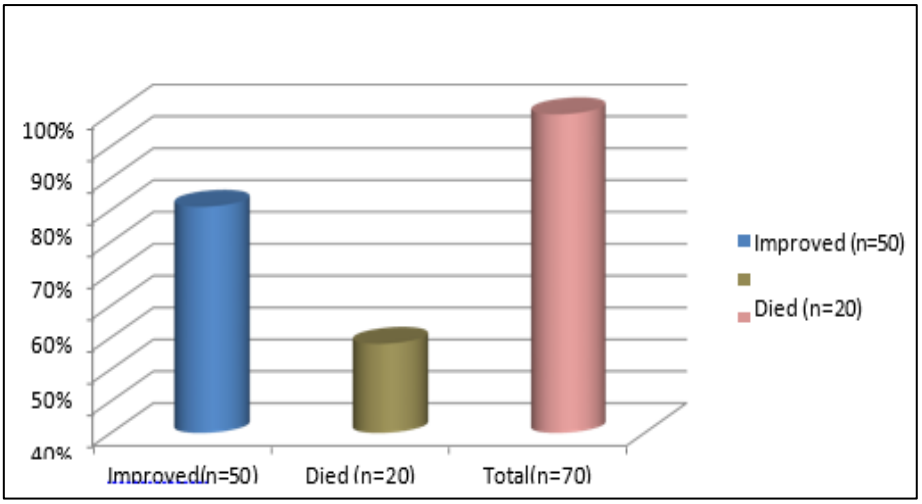


**Figure 1:** Outcome of patients included in this study.

There is no statistically significant association between outcome after dialysis and gender of patients, 55% of dead patients were males, and 45% of them were females, compared to 62% of males and 38% of females were alive, p-value 0.6. No significant association between the age group of patients and outcome, p-value 1.0, as presented in Table 6.

**Table 6:** Association between outcome after dialysis with gender and age group of patients.

| | | Outcome after dialysis | | Total | P-value |
|---|---|---|---|---|---|
| | | Alive | dead | | |
| Gender | male | 31 | 11 | 42 | 0.6 |
| | | 62.0% | 55.0% | 60.0% | |
| | female | 19 | 9 | 28 | |
| | | 38.0% | 45.0% | 40.0% | |
| Age group | neonate | 15 | 9 | 24 | 1.00 |
| | | 30.0% | 45.0% | 34.3% | |
| | infant | 13 | 2 | 15 | |
| | | 26.0% | 10.0% | 21.4% | |
| | 1-5 yrs | 14 | 3 | 17 | |
| | | 28.0% | 15.0% | 24.3% | |
| | more than 5 yrs. | 8 | 6 | 14 | |
| | | 16.0% | 30.0% | 20.0% | |
| Total | | 50 | 20 | 70 | |
| | | 100.0% | 100.0% | 100.0% | |

No significant association between indication of dialysis and patient's outcome, p-value 0.63. Regarding dead patients, 60% had severe acidosis, 15% had anuria, 10% had pulmonary edema, and 15% had uremic encephalopathy, as presented in Table 7.

**Table 7:** Association between indication of dialysis and patient outcomes.

| Indication of acute PD | Improved patients | Dead patients | Total | P Value |
|---|---|---|---|---|
| Severe metabolic acidosis | 31 | 12 | 43 | 0.63 |
| | 62% | 60% | 61.4% | |
| Anuria | 10 | 3 | 13 | |
| | 20% | 15% | 18.6% | |
| Pulmonary edema | 3 | 2 | 5 | |
| | 6% | 10% | 7.1% | |
| Uremic encephalopathy | 6 | 3 | 9 | |
| | 12% | 15% | 12.9% | |
| Total | 50 | 20 | 70 | |





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**Table 8:** Mean of WBC, HB, and urea, S.cr, S. Na, S. K, S Ca, S PO4, S Cl, HCO3, PH, and PCO2 in both groups before and after dialysis.

| | outcome | NO | Before dialysis | | After dialysis | | p-value≠ | p-value † |
|---|---|---|---|---|---|---|---|---|
| | | | Mean ± SD | SE | Mean ± SD | SE | | |
| WBC | Alive | 46 | 12.08 ± 4.79 | 0.70 | 9.37±2.41 | 0.34 | 0.11 | <0.001* |
| | Dead | 20 | 14.12 ± 4.45 | 0.99 | | | | |
| HB | Alive | 45 | 10.08 ± 1.82 | 0.27 | 10.82±1.07 | 0.15 | 0.45 | <0.001* |
| | Dead | 20 | 10.44 ± 1.63 | 0.36 | | | | |
| urea | Alive | 50 | 183.88±48.55 | 6.86 | 40.36±12.49 | 1.76 | 0.53 | <0.001* |
| | Dead | 20 | 175.55±53.18 | 11.89 | | | | |
| S. Cr | Alive | 44 | 3.80 ± 2.10 | 0.31 | 0.85 ± 0.30 | 0.04 | 0.34 | <0.001* |
| | Dead | 20 | 4.38 ± 2.49 | 0.55 | | | | |
| S Na | Alive | 50 | 137.84±18.02 | 2.54 | 140.98 ± 3.62 | 0.51 | 0.80 | 0.22 |
| | Dead | 20 | 138.85 ± 5.63 | 1.26 | | | | |
| S k | Alive | 46 | 4.21 ± 0.45 | 0.13 | 4.06 ± 0.88 | 0.06 | 0.22 | 0.21 |
| | Dead | 20 | 4.35 ± 0.81 | 0.18 | | | | |
| S Ca | Alive | 44 | 8.07 ± 1.13 | 0.17 | 8.72 ± 0.57 | 0.08 | 0.94 | 0.001* |
| | Dead | 20 | 8.05 ± 0.79 | 0.17 | | | | |
| S PO4 | Alive | 44 | 4.41 ± 0.65 | 0.14 | 4.21 ± 0.95 | 0.09 | 0.94 | 0.24 |
| | dead | 20 | 4.19 ± 0.94 | 0.21 | | | | |
| S Cl | alive | 50 | 100.81±5.90 | 0.83 | 100.60±2.72 | 0.38 | 0.07 | 0.81 |
| | dead | 20 | 95.92±16.42 | 3.67 | | | | |
| HCO 3 | alive | 50 | 15.69 ± 3.97 | 0.56 | 23.03±1.39 | 0.19 | 0.01* | <0.001* |
| | dead | 20 | 12.58 ± 5.37 | 1.20 | | | | |
| PH | alive | 50 | 7.12 ± 0.15 | 0.02 | 7.38 ± 0.03 | 0.004 | 0.06 | <0.001* |
| | dead | 20 | 7.04 ± 0.15 | 0.03 | | | | |
| PCO2 | alive | 50 | 27.94 ± 4.35 | 0.61 | 38.81±2.75 | 0.38 | 0.001* | <0.001* |
| | dead | 20 | 23.54 ± 5.71 | 1.27 | | | | |

The cause of AKI in relation to outcome result showed that in alive patients, AGE was the cause in 26% of patients, AGN in 4% of patients, DKA in 4%, HUS in 10%, Obstructive uropathy in 18%, and septicemia in 34%. No significant correlation between cause of AKI and fate of patient, p-value 0.34, as presented in Table 9.

**Table 9:** Correlation between the cause of AKI and the fate of the patient.

| | | outcome after dialysis | | Total | p-value |
|---|---|---|---|---|---|
| | | Alive | dead | | |
| cause of AKI | AGE | 13 | 3 | 16 | 0.34 |
| | | 26.0% | 15.0% | 22.9% | |
| | AGN | 2 | 1 | 3 | |
| | | 4.0% | 5.0% | 4.3% | |
| | DKA | 4 | 3 | 7 | |
| | | 8.0% | 15.0% | 10.0% | |
| | HUS | 5 | 0 | 5 | |
| | | 10.0% | 0.0% | 7.1% | |
| | Obst. uropathy | 9 | 2 | 11 | |
| | | 18.0% | 10.0% | 15.7% | |
| | septicemia | 17 | 11 | 28 | |
| | | 34.0% | 55.0% | 40.0% | |
| Total | | 50 | 20 | 70 | |
| | | 100.0% | 100.0% | 100.0% | |





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## DISCUSSION

Acute peritoneal dialysis or APD is a non-vascular renal replacement therapy that can be used to treat patients with acute kidney injury. It could contribute to the control of the situation of volume congestion in patients with impaired cardiovascular wellness, instable changes in blood pressure, or difficulties with the vascular access. It is also useful in treating acute hemorrhagic pancreatitis, hypothermia, and tumor lysis syndrome (George, J. *et al.*, 2011). It is not mentioned that peritoneal dialysis (PD) can be associated with any drawbacks. In the industrialized nations, where APD facilities are usually provided, the sufficient presence of dialysis is common. In developing nations, the case is different as the current study involves 70 patients of different age categories in the pediatric section with a male-to-female ratio of 1.18:1. The proportion of the sample size is 54.29 and 45.71 male and female, respectively. (Lalji, R. *et al.*, 2020)

The gender dimension of the patients included in this study was similar to some of the past studies, where most of the sample was composed of men. Big Data CKD and ESKD normalcy and prevalence are higher among men and boys in comparison to women and girls. In both developed and low-resource conditions, boys tended to develop kidney illness in early age infancy more than girls because the former is more likely to have congenital urological illness. In early development of the bladder, the rate of maturation control is gender-specific (Koy, A. B. *et al.*, 2020; Golej, J. 2002). The patients were divided into groups in order to classify their ages. The highest proportion of patients between the ages of one year to neonate was 35.7 percent, and between the groups of infants and those above five years, 27.14 percent and 22.85 percent, respectively.

A study of the AKI medical literature showed that the pathogenic spectrum used in industrialized countries and developing countries varies widely. In hospitals of industrialized countries, AKI is typically acquired, though community-acquired AKI had to be more frequently reported in underdeveloped countries. The main cause of AKI in this paper was septicemia, which was followed by acute gastroenteritis, obstruction uropathy, DKA, HUS, and AGN. The research in Nigeria, as per (Auron, A. *et al.*, 2007), indicated that acute diarrhea, acute glomerulonephritis, sepsis, and hypovolemia were the chief causes. Likewise, sepsis-related complications and diarrhea were the leading causes of AKI in a study done in Bangladesh previously (Goes, C. R. *et al.*, 2013). Many patients had renal abnormalities in their congenital histories, as well as having an adverse medical past, and diabetes mellitus was the most frequently reported among patients having a positive medical past.

As its cause may be diabetic ketoacidosis (DKA), which may result in acute kidney damage (AKI), it is linked to dehydration. There are wide differences in the incidence of AKI reported among patients of DKA in studies. One out of five persons who had to obtain dialysis was admitted to the pediatric triple care unit. The most frequently observed among critically unwell children which were referred to intensive care units (PICUs) have acute kidney damage (AKI) as a result (Fleming, F. *et al.*, 1995; Burdmann, E. A., & Chakravarthi, R. 2011). Even though the frequency of AKI in PICUs has been indicated between 30% and 50 per cent, most of the children have the illness in its early stages. Yet, these kids can easily deteriorate and display an increase in the level of AKI, basing on the condition underlying the illness, the severity, and various other factors. (Krause, I. *et al.*, 2011)

The highest cause of dialysis patients was severe metabolic acidosis after anuria. The best causes of dialysis, as compared to a past study, included chronic metabolic acidosis and fluid overload. The patients presented with a variety of characteristics, although the most frequent were oliguria/anuria, fever, and edema; acidosis, less level of awareness, and oliguria. The cause of AKI and the way in which it presents and progresses could be the main reason why the research was inconsistent regarding the most frequent presenting symptom and the evidence of dialysis. The death rate among children who have severe AKI is high. (Kwiatkowski, D. M. *et al.*, 2017; Chadha, V. *et al.*, 2000)

Several of these deaths were at a rate of between 36 to 50 percent, even after the upgrades in the critical care of the pediatric and the enhancement on the RRT in the rich nations (Wong, S. N., & Geary, D. F. 1988). One of the risks associated with death in severe AKI requiring RRT is bone sepsis, transplant, excessive fluid levels, use of vasopressor, late initiation of RRT, and infant patients. The new research mortality rate is 28.57, which does not exceed the aforementioned interval. But, a study in Nigeria (50.4) and India



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(46.3) indicates that the percentage of fatality is higher. Pakistan's mortality rate was lower (5.2), and China's mortality rate was lower (16.7) based on two studies. (Pedersen, K. R. *et al.*, 2008; Al-Hwiesh, A. *et al.*, 2018; LaPlant, M. B. *et al.*, 2018)

The efficacy and outcomes of acute PD were measured in 31 newborns in the NICU, who lost WBC, HB, urea, creatinine, and calcium levels after dialysis. Before and during dialysis, the averages of urea, Na, K, and creatinine of the surviving patient were compared, but no p-value was determined. Comparing the means of the two instances in the four parameters, the majority of patients exhibit a normal mean after undergoing dialysis. The results of the present study the test showed a marked and gradual decrease in serum creatinine and urea levels and a concomitant rise in WBC, HCO 3, and PCO 2 levels, which corroborated the efficacy of PD in removing waste products and maintaining maintenance of renal functions. (Murala, J. S. *et al.*, 2010; Nepfumbada, M. *et al.*, 2018).

## CONCLUSION

PD is a favorable and alternative RRT practice in the pediatrics unit. A number of pediatric conditions may be treated with APD as a relatively simple, safe, and beneficial method of renal replacement. It can also be a right intervention that can be applied to newborns. In spite of the fact that these complications are not common, they do happen.

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