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Epidemiological and clinical profile of gynecological and obstetric patients with stage 5-d chronic kidney disease in a critical care unit

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Abstract

Introduction: Population studies describe that sex profoundly affects the epidemiology of kidney disease. This study aimed to describe the epidemiological and clinical profile of women with kidney disease admitted to the critical care unit who required renal replacement therapy.

Methods: Descriptive, observational, cross-sectional study conducted at the National Women's Hospital in San Salvador between 2017 and 2021. The sample was nonprobabilistic.

Results: Patients' most frequent age range is between 21 and 30 years, representing 46% of the population. 76% of the patients admitted to the study had obstetric pathology, while 24% only had gynecological pathology. Regarding chronic pathologies present at the time of starting RRT, 28% had no preexisting chronic pathologies; In the rest of the population, renal pathology was present in 45% of the total cases, this being the predominant one over other diagnoses.

Conclusion: In the female sex, gynecological and obstetric pathologies, both in the presence and absence of known renal disease, are associated with a high rate of need for renal replacement therapy.

Keywords:

MESH: Renal Dialysis; Renal Insufficiency, Chronic; Women; Intensive Care Units.

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Chronic kidney disease (CKD) and acute kidney injury (AKI) are common complications in the intensive care unit (ICU) and are frequently associated with multiple organ failure with high mortality that reaches 50% when renal replacement therapy is needed. (TRR) [1].

They are characterized by a deterioration of renal function over a period of hours to days in the case of AKI and over a period of months or years in the case of CKD, with an inability of the kidney to maintain a fluid and electrolyte balance and purify the waste products of metabolism. The KDIGO criteria to define AKI are based on serum creatinine (SCr) levels and urine volume, being described as an increase in Scr ≥ 0.3 mg/dL within 48 hours or an increase in Scr ≥ 1.5 times the baseline presumed to have occurred in the previous seven days or a urine volume ≤ 0.5 ml/kg/hour in the last 6 hours when diuresis is taken into account [2-4]. On the other hand, CKD is defined as abnormalities in renal function or structure present for more than three months with the presence of albuminuria, urinary sediment abnormalities, hydroelectrolyte abnormalities, histological abnormalities, imaging abnormalities, or a history of renal transplantation with compromised kidney function. glomerular filtration rate <60 ml/min/1.73 m2 [5, 6].

General population studies have found that gender has a profound effect on the epidemiology of kidney disease. Regarding CKD, most studies show that significantly more women than men are affected by kidney disease, although a higher proportion of male individuals evolve to RRT [7]. In the case of AKI, the studies are variable, but a higher ratio is evident in the female sex, although it may vary according to the etiology of the disease.

Pregnancy-related AKI refers to the abrupt deterioration of renal function that occurs during pregnancy or the puerperium that results in the retention of urea or other nitrogenous products, generating alteration of the extracellular volume and disturbance in the electrolyte balance. This pathology in pregnant women is associated with adverse maternal and fetal outcomes, including progression to advanced-stage renal disease, even reaching the need for RRT, increased maternal mortality, and a higher incidence of prematurity and perinatal death [8-10]. The etiology of AKI in pregnancy is varied and ranges from mild causes due to prerenal reasons, such as volume depletion that is resolved with fluid therapy, to other causes, such as septic abortion or thrombotic microangiopathy (TMA), that can be life-threatening and urgently require renal replacement therapy (RRT) [11, 12]. However, despite the availability of various RRT techniques and the optimization of supportive measures, the survival of these patients is limited if the underlying pathology that triggers the need for RRT is not resolved [12, 13].

In recent years, even though a positive impact has been achieved for the health and life of women by drastically decreasing the indicators related to maternal mortality and female morbidity, AKI and CKD remain significant public health problems, especially during pregnancy. This research will be carried out to describe the epidemiological and clinical profile of women with kidney disease admitted to the critical care unit of the National Hospital for Women who required renal replacement therapy.

Materials and methods

Study design

The present study is cross-sectional. The source is prospective.

Scenery

The study was conducted in the intensive care unit of the National Women's Hospital in San Salvador. The study period was from January 1, 2017, to December 31, 2021.

Participants

The inclusion criteria were female patients admitted to the intensive care unit with AKI or CKD who required RRT. The exclusion criteria were patients with CKD with outpatient RRT previously assigned to a renal unit and patients with incomplete clinical records.

Variables

The variables were age, etiology, functional status, indication for the start of dialysis, and comorbidities.

Data sources/measurements

The source was mixed: direct and indirect; surveys and measurements were carried out on the patients upon admission to the study before the hemodialysis session. Additionally, one group required consultation on the institutional clinical history. The information was treated confidentially; no personal data were included to identify the study subjects.

Biases

To avoid possible interviewer, information, and memory biases, the principal investigator kept the data at all times with a guide and records approved in the research protocol. Observation and selection bias was avoided by applying the participant selection criteria. All the clinical and paraclinical variables of the period above were recorded. Two researchers independently analyzed each of the records in duplicate, and the variables were recorded in the database once their concordance was verified.

Study size

The sample was nonprobabilistic, census type, where all possible cases of the study period were included.

Quantitative variables

Descriptive statistics were used. The results were expressed on a scale of means and standard deviation. Categorical data such as sex are presented in proportions.

Statistical analysis

Noninferential descriptive statistics are used, where measures of central tendency and dispersion were calculated according to the measurement scale of each variable. Qualitative variables are presented as

absolute numbers and percentages; quantitative variables are presented as medians and standard deviations.

The statistical significance level was $P < 0.05$. The statistical package used was SPSS 28.0 (IBM Corp. Released 2021. IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp.

Results

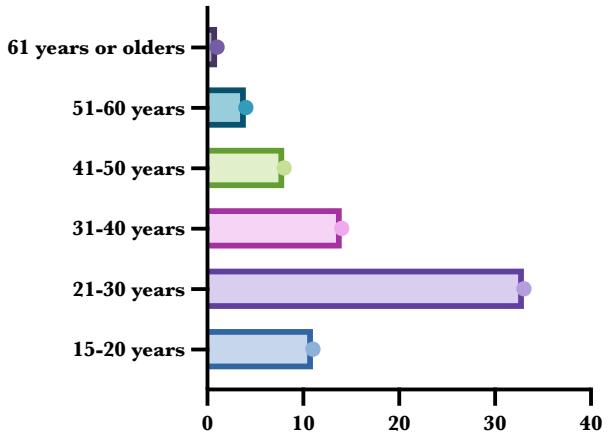
Participants

A total of 71 analyzable patients entered the study.

General characteristics of the sample

The most frequent age range of patients was between 21 and 30 years, representing 46% of the population, followed by 31 to 40 years, with 19% of the population (Figure 1.

Figure 1. Study participants were categorized by age.



Sample Descriptions

Seventy-six percent of the patients admitted to the study had obstetric pathology, while 24% only had gynecological pathology. Most patients requiring renal replacement therapy come from rural areas, accounting for 58% of all cases.

Regarding nutritional status, the trend for body mass index was primarily average, followed by overweight, 62%, and 25%, respectively. There were no cases of patients within the obesity range.

Regarding chronic pathologies present at the time of starting RRT, 28% had no preexisting chronic pathologies. In the rest of the population, renal pathology was present in 45% of the total cases, this being the predominant one over other diagnoses. Within the people with a known history of previous kidney disease, the most frequent stage was the terminal stage (CKD V) in 28% of all cases, followed by chronic kidney disease in other locations, which accounted for 14% (Figure 2).

Regarding the causes that precipitated the need for RRT, a variety of etiologies were documented, the most predominant being the existence of a previously known kidney disease that presented exacerbation given the patient's serious condition, representing 38% of all cases. Pelvic neoplasms are second in frequency, accounting for 18% of cases. Cases of systemic disorders such as sepsis or hypertensive disorders of pregnancy ("THE") were less frequent, representing 7% and 8%, respectively (Figure 3).

Figure 2. History of previous renal pathology in patients who required renal replacement therapy in the ICU.

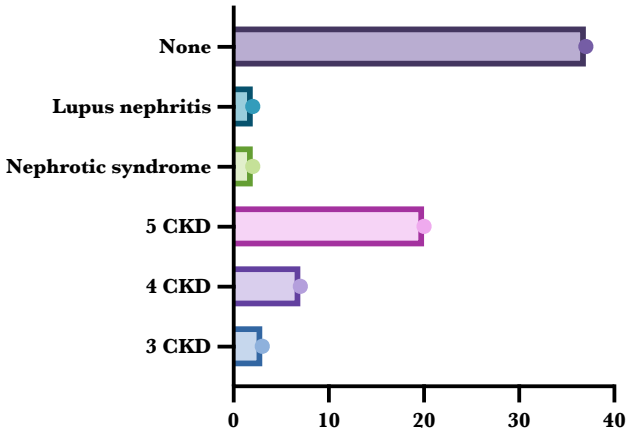
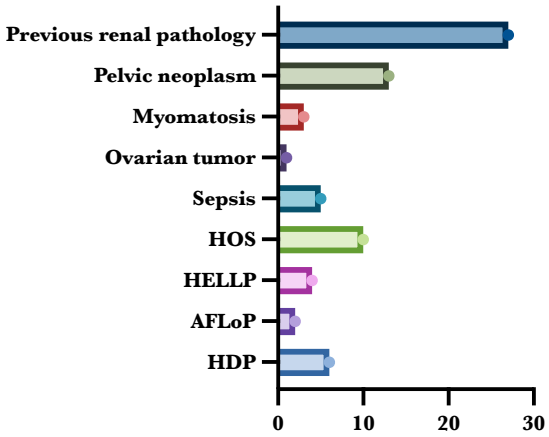


Figure 3. Presence of hypertension with the use of antihypertensives in the study groups.



AFLOP: acute fatty liver of pregnancy; HDP: hypertensive disorders of pregnancy. HELLP: hemolysis, elevated liver enzymes, and low platelet count.

Economic analysis

Finally, 51% of the patients required permanent RRT upon hospital discharge, while 27% resolved the renal problem without long-term sequelae.

Discussion

Despite the new trends in managing critically ill patients, where the prevention of kidney damage is emphasized, kidney disease continues to be a familiar entity in critical patient rooms, even in obstetric commodities. When analyzing the data from our study, we can conclude that in the sample studied, the most affected age group is that of childbearing age, probably due to the obstetric nature of the patients who attended. Likewise, the highest percentage of patients presented some obstetric condition during the study. This fact calls attention given that historically and worldwide, it is scarce to observe RRT in pregnant women as a consequence of CKD provided the hormonal dysfunction that arises secondary to the uremia that finally triggers anovulation [14]. However, we could deduce that the evolution toward TRR was either due to exacerbation of CKD that was not in an advanced stage or as a consequence of AKI triggered by a pregnancy disorder.

The population of rural origin was the majority, consistent with the epidemiology of kidney disease, which has always seen its appearance inclined in people of this demographic origin [15]. In the same way, as in the age analysis, the study population maintains a normal nutritional status, which can be attributed to being a young population. Due to gynecological and obstetric problems, the patients in the study rarely had a family history of kidney disease and associated chronic pathologies.

Already established chronic kidney disease that coincides with gynecological and obstetric conditions was the leading cause of indication for renal replacement therapy; however, pelvic neoplasms and obstetric complications play a leading role in the appearance of newly diagnosed kidney damage that warrants renal replacement therapy [16, 17].

The most frequent complication presented after dialysis therapy is anemia, which is considered an inherent part of this type of management in the literature. The fact that iatrogenic complications or those of nosocomial origin appear in the minority of the study's total population [18, 19] is encouraging.

Conclusion

In women, gynecological and obstetric pathologies, both in the presence and absence of known renal disease, are associated with a high rate of need for renal replacement therapy. The use of hemodialysis continues to be a challenge and a high-risk scenario for women with severe pathology, especially those who are pregnant or postpartum. Given the high frequency of renal compromise in women in critical condition, clinical studies are necessary that include a better characterization of the profile of women with CKD and AKI, both on RRT and outside of it, to determine a better clinical approach to our patients.

Abbreviations

CKD: Chronic kidney disease.
AKI: acute kidney injury.
RRT: renal replacement therapy.
ICU: Intensive care unit.

Supplementary information

Supplementary materials have not been declared.

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Does not apply.

Author contributions

Wilmer Borjas-Mancia: Data curation, Formal analysis, Fundraising, Research, Methodology, Project management, Resources, Software, Writing – original draft.
Eliseo Guzman-Cisneros: Conceptualization, Supervision, Validation, Visualization, Writing: review and edition.
María Raad-Sarabia: Conceptualization, Supervision, Validation, Visualization, Writing: review and edition.
Rodrigo Daza-Arnedo: Conceptualization, Supervision, Validation, Visualization, Writing: review and edition.
Jorge Rico-Fontalvo: Conceptualization, Supervision, Validation, Visualization, Writing: review and edition.
All authors read and approved the final version of the manuscript.

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Availability of data or materials

The data sets generated and analyzed during the current study are not publicly available due to the confidentiality of the participants.

Statements

Ethics committee approval and consent to participate

It does not apply to observational studies.

Consent for publication

Not required for studies that do not publish patient photographs, CT scans, or X-ray studies.

Conflicts of interest

The authors report no conflicts of interest.

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