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ONE YEAR OBSERVATIONAL STUDY TO DETERMINE THE CAUSES OF ACUTE RENAL FAILURE IN PREGNANCY

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Abstract:

Aim: *To determine the incidence of acute pregnancy-related renal failure, clinical spectrum, mortality and morbidity of this avoidable pregnancy complication.*

Study Design: *An observational and prospective hospital-based study.*

Place and Duration: *In the Nephrology department in collaboration with obstetrics and gynecology department of Jinnah Hospital Lahore for one-year duration from January 2019 to January 2020.*

Methods: *A total of 140 patients with ARI were admitted to the nephrology department. 54 of them are specific to the obstetric ARF and was included in the study. A predesigned proforma was used. Medical history has been recorded and all have been clinically examined. Vital signs and urine output were regularly recorded. Special tests were performed, such as routine laboratory tests and DTPA testing, in some cases D-dimers were performed. The final result has been registered. Most of the 32 patients were from rural areas.*

Results: *Obstetrical related acute renal failure number 54 (39%) of which 30 (56%) were multipara and 24(44%) were primigravida. They were between 18 and 42 years old. Most 32 patients (59%) did not receive prenatal care. In the past, traditional midwives gave birth at home compared to 7 (13%) cases with adequate prenatal care. 9(17%) cases presented in their first trimester of pregnancy while 45(83%) patients developed acute renal failure in their third trimester or in the puerperium 20(37%) were anuric. Blood loss that caused hypotension due to postpartum and antenatal bleeding was the most common cause of acute renal failure. The clinical spectrum of acute renal failure due to pregnancy showed antenatal hemorrhage in 11 (20%) cases, postpartum hemorrhage in 14 (25%) cases, postpartum septicemia and septic abortion, and extensive intravascular thrombosis in 18 (33%) cases, intrauterine disease 7 (13%) and preeclampsia, eclampsia, hemolysis, high levels of liver enzymes, low platelet count in 4 (7%) cases. 44 (81%) patients underwent hemodialysis and 10 (19%) did not require hemodialysis. The most common clinical diagnosis was acute tubular necrosis in 33 (61%) patients with complete recovery. Acute necrosis of the renal cortex was observed in 11 (22%) cases.*

Conclusion: *Acute renal failure due to pregnancy is an important health problem in rural areas and has very high mortality and morbidity. The lack of reasons is the lack of antenatal clinics, poor health care and late referrals.*

Keywords: *acute renal failure, antenatal bleeding, hemodialysis.*

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INTRODUCTION:

Acute renal failure associated with pregnancy is one of the most common causes of acute renal failure (ARF). Acute renal failure can be defined as a sudden decrease in renal function, usually reversible, for several hours to several days, resulting in the retention of nitrogen metabolism products (i.e. blood urea nitrogen (BUN)). and creatinine) in the body. Over the past two decades, several major causes of ARF associated with pregnancy and its pathophysiological mechanism have been described. ARF can occur during prenatal and postpartum pregnancy. The main causes of pregnancy-related ARI may be (1) septic abortion during early pregnancy, resulting in septic shock and acute tubular necrosis, and (2) causes of late pregnancy. 34 weeks of pregnancy and postpartum. Delivery bleeding (PAH), placental abruption, postpartum hemorrhage (PPH), hemolytic uremic syndrome (HUS), hemolysis, high liver enzyme, low platelet count syndrome (HELLP), preeclampsia, postpartum sepsis and hemodialysis. Among these causes, acute tubular necrosis (ATN) is the most common lesion, but has an excellent prognosis compared to eclampsia, HELLP syndrome, diffuse intravascular coagulation (DIC), and other HUS-related pathologies. the proportion of glomeruli is dominant. However, in the case of septic abortion causing ATN, the causative organism Clostridium has a high mortality rate. It is assumed that all these diseases are symptoms of thrombotic microangiopathy caused by endodontic damage due to the lack of NO-dependent endothelial relaxation factors. The poor prognostic change observed in pregnancy-related acute renal failure is bilateral acute renal cortical necrosis (BCN). It is rarely found in industrialized countries. Other bad prognostic changes observed in induced obstetric ARF are HUS, severe eclampsia and HELLP syndrome, most patients require conservative dialysis or survive with significantly reduced kidney function, severe enough to require ARF Dialysis is extremely rare in industrialized countries, the frequency of all pregnancies 1: 20,000 or less. These statistics show a significant improvement compared to the situation in 1950 and 1960, with 22% of all cases of acute renal failure of obstetric origin and mortality between 20-48%. This success in industrialized countries is most likely due to the liberalization of abortion laws, better prenatal care and better management of maternal complications that could potentially lead to ARI. On the other hand, the incidence of cortical necrosis in developing countries is still very high, according to Ramzan et al. In Pakistan it is about 13%, and in India, as reported by Parkash et al. This is often seen after APH, long-term fetal arrest.

There is also incomplete (irregular) cortical necrosis followed by variable restoration of renal function and a stable period of moderate renal failure for several years, and in some cases end-stage renal disease may occur after several years. The incidence of pregnancy-related ARIs has not changed significantly in developing countries such as Pakistan. In the past, there was a lack of local data to compare with some rare items that show 7-10% of pregnancy-related acute renal failure. Mortality due to pregnancy-related kidney failure depends on the underlying kidney damage and related complications. Severe preeclampsia, HELLP syndrome and pregnancy, sepsis, DIC, HUS and acute fatty liver cortical necrosis are high if associated. The purpose of this study was to understand the scale of the problem leading to high mortality and morbidity. Midwifery renal disease is a changing health problem for the people of Pakistan, especially in rural areas.

PATIENTS AND METHODS:

This study has taken place in the Nephrology department in collaboration with obstetrics and gynecology department of Jinnah Hospital Lahore for one-year duration from January 2019 to January 2020. This is an observational study. During this year, 140 patients with acute renal failure were admitted to the nephrology department. Of these, 54 patients had acute renal failure due to pregnancy and were sent from the obstetric services. All ARF patients with pregnancy were included in the study. Full history, clinical examination, all necessary laboratory tests and urine collection were recorded separately. All patients underwent an ultrasound. In selected cases where healing was delayed by more than 3 weeks, special tests were performed, such as a DTPA kidney test and kidney biopsies. Hemodialysis was indicated as part of the treatment. Conservative treatment includes all available treatments, such as fluid management, diuretics, electrolytes, blood transfusions, antihypertensives and antibiotics. Recovery after ARF was reported when renal function returned to normal. Partial recovery was suspected due to irregular cortical necrosis when renal function improved, but did not return to normal even after 12 weeks. When the patient remained anuria for more than 3 weeks, cortical necrosis was diagnosed and DTPA renal examination showed very poor bilateral renal perfusion, renal ultrasound increased bilateral echogenicity with small kidneys and diffuse renal cortical calcification, and patients were dependent on dialysis. Renal angiography is the gold standard for diagnosing cortical necrosis, but this cannot be done for convenience.

RESULTS:

A total 140 cases of acute renal failure with different etiologies were admitted in Nephrology Department. Patient ages ranged from 18 to 42 years old. Of these 140 patients, 54 (39%) had obstetric ARF associated. 30 (56%) were multipara and 24 (44%) were primigravida. Acute renal failure occurred in 9 (17%) cases in the first part of pregnancy (first trimester), in 45 (83%) cases in the last period of pregnancy, i.e. in the third trimester and the puerperium. Most of the 32 patients (59%) did not receive antenatal care at any time during pregnancy and had traditional home care assisted by a midwife (Dai), 22 (41%) patients were hospitalized but without prenatal care. Anuria was observed in 20 (37%) cases and the remaining 34 (63%) patients had reduced urine volume or oliguria. In our study, blood loss due to hypotension was the most common cause of ARF. Sepsis, diffuse intravascular coagulation, intrauterine death, HELLP syndrome (hemolysis, high liver enzymes and low platelet counts) and preeclampsia were also the most common causes by frequency. The most common clinical diagnosis was acute tubular necrosis (ATN) in 33 (61%) cases. Complete healing was observed in 33 (61%) patients. While 12 (22%) patients developed irreversible renal failure, 11 (22%) patients developed bilateral cortical necrosis due to APH, sepsis and DIC. Renal biopsy was performed in 7 patients (13%) with necrotic lesions of the coils in five samples (acute cortical necrosis) and diffuse glomerular necrosis and irregular cortical necrosis in 12 patients who developed irreversible renal failure in two biopsy reports. Five patients died and two developed chronic kidney disease and creatinine clearance was conservatively treated between 20-35 ml / min. 5 patients have died. Sepsis, hyperkalemia and pulmonary edema with multi-organ failure were common causes of mortality. The spectrum of acute renal failure due to pregnancy is shown in Table 1.

Table 1: Spectrum of obstetrics related acute renal failure (n=54)

	Frequency	%Age
Hemorrhage	25	46.0
Postpartum hemorrhage	14	26.0
Ante-partum hemorrhage	11	20.0
Sepsis and disseminated intravascular coagulation	18	33.0
Intrauterine disease	7	13.0
Hemolysis, elevated liver enzyme, low platelets syndrome	4	8.0

DISCUSSION:

Acute obstetric renal failure is currently a very rare disease in developed countries. Its incidence is less than 1: 20,000 of all pregnancies. However, in this study, our pregnancy-related acute renal failure data (39%) is presented for one year. In South Africa, the situation has improved in some developing countries, such as India and Turkey. Chugh et al. It has been reported from India that it has decreased its incidence from 22% in 1965–1974 to 9% in 1981–1986. In South Africa, the incidence of pregnancy-related ARI fell from 25% in 1978. To 16% in 1992. It increased to 13% from 17% in 1997. To 80 at the beginning of the situation in Turkey. ARF obstetrics is now a very rare entity in developed countries. Strata et al. It was found that the incidence of obstetric ARI decreased from 43% (1956–1967) to 0.5% according to the total number of ARI cases (1988–1994) and no maternal death or irreversible kidney damage were observed. in the last eight years. Data from several national studies showed very high mortality (18% to 23%) and morbidity (13% to 26%) associated with obstetric RFA. The striking feature of this study has shown that pregnancy-induced ARF is more frequently observed (60%) in patients who are not prenatally looked after and their births are carried out at home using dai without aseptics. The hospital also reports that women born there who are not covered by antenatal care are more prone to developing ARF 16 (30%). This number shows the importance of prenatal care in the prevention of pregnancy-related ARI. The industrialized people and some developing countries have achieved these goals by liberalizing abortion laws, improving healthcare facilities and taking more effective comprehensive preventive action. Pakistan's data on pregnancy-related ARF are low. In 2008, Ansari et al. 36% of obstetric ARFs from Hyderabad and Inner Sindh were reported, with an overall incidence of 19% and a mortality rate of 26%. In 1996, Naqvi et al. 18% obstetric ARF with 18% mortality and 26% incidence in Karachi was reported. Having maximum health care compared to the rest of the country. It has been reported that all cases of ARI obstetric ARI in the northern regions are 7-10% and the mortality rate is 18%. These figures show that the incidence of pregnancy-related ARI is very high in Pakistan. If we compare our data with the rest of the country, this indicates an alarming high prevalence of ARI associated with pregnancy in Balochistan and

Afghanistan. This indicates failures of health care facilities, especially prenatal care in the province.

CONCULSION:

Our study shows obstetric ARF, one of the most common causes of acute renal failure, currently found in a rare subject in developed and developing countries. It is also a dangerous complication of pregnancy with very high mortality and morbidity. They require modernization to existing healthcare facilities, means of transport, prior recommendations and public awareness-raising programmers, better public-sector hospital care, and special training for TBA.

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