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شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

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التوثيق الالكتروني والميكروفيلم

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التوثيق الإلكتروني والميكروفيلم

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بالرسالة صفحات لم ترد بالأصل

Study of Pregnancy related AKI in Egyptian patients: Incidence, Risk factors and Outcome

Thesis

Submitted For Partial Fulfillment of MD In Internal Medicine

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ABSTRACT

Background: Acute kidney injury (AKI) is a serious problem during pregnancy. Once occurred, it causes devastating maternal and fetal outcomes. In developed nations, the trend of pregnancy-related AKI (PRAKI) is on a decline due to the advances in obstetrics care and the legality of abortion. On the contrary, this situation remains a major health problem in the developing countries. **Aim of the work**: in the present study, we determine the incidence, etiology and outcome of PRAKI in a sample of Egyptian patients. **Methods**: Prospective observational study to determine the incidence, etiology and outcome of PRAKI was conducted over a period of one year from January to December 2017 at Ain Shams university obstetrics & gynecology hospital. Patients were enrolled in this study once PRAKI at antepartum as well as postpartum period was diagnosed according to the definition of KDIGO AKI guidelines diagnostic criteria **Results**: During the period of the study a total of 13050 obstetric patients were admitted in Ain Shams university obstetrics & gynecology hospital. In total, 78 patients met the diagnostic criteria of PRAKI representing an incidence of 0.59% (78/13050). Pre-eclampsia & sepsis were the two most common causes of PRAKI, others were dehydration, postpartum hge, antepartum hge, UTI, proteinuria for investigation, SLE activity, DIC, TTP, Acute fatty liver of pregnancy, eclampsia, eclampsia complicated with HELLP syndrome, eclampsia with acute fatty liver of pregnancy, HUS, hyperemesis gravidarum, hypertensive emergency. Fifty five patients (70.5%) received conservative management. Hemodialysis was initiated in twelve patients (15.3%) based on standard indication (azotemia, oliguria volume overload, hyperkalemia and/or metabolic acidosis). Plasma exchange was indicated for seven patients. Hemodialysis and plasma exchange was used for four patients (5.1%). The ultimate evolution was good in 47 (60%) patients with complete recovery of the kidney function.14 women (17.9%) had an increased serum creatinine level at discharge for follow up at nephrology outpatient clinic. 6 patients (7.6%) had kept with advanced renal failure requiring hemodialysis. There were 11 cases of death, mortality rate was 14%.
Conclusion: AKI during pregnancy poses a challenge for physicians. In view of the multifaceted problems that potentially complicate pregnancy in women with AKI. Fortunately, with ongoing improvements in obstetrical care, multidisciplinary approaches maternal and perinatal mortality in this setting are largely avoidable.

Keywords: Pregnancy related acute kidney injury (PRAKI), systemic lupus erythematosis (SLE), disseminated intravascular coagulopathy (DIC), thrombotic thrombocytopenic purpura (TTP), and hemolytic uremic syndrome (HUS).

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List of Abbreviations

Abb.	Full Term
ASB	Asymptomatic bacteriuria
ADAMTS-13	a disintegrin and metalloproteinase with a thrombospondin type 1 motif, member 13
AFLP	Acute fatty liver of pregnancy
aHUS	Atypical hemolytic uremic syndrome
AKI	Acute kidney injury
APH	Antepartum hemorrhage
ATN	Acute tubular necrosis
BRCN	Bilateral renal cortical necrosis
BUN	Blood urea nitrogen
CAP	Complement alternative pathway
CFU	Colony forming unit
CKD	Chronic kidney disease
CKD-EPI	Chronic kidney disease-Epidemiology collaboration
CS	Cesarean section
C_5	Complement factor 5
DIC	Disseminated intravascular coagulation
eGFR	estimated Glomerular filtration rate
ESRD	End Stage Renal Disease
FDA	Food and drug administration
FFP	Fresh frozen plasma
FH	Factor H
FLT-1	fms-like tyrosine kinase-1
GFR	Glomerular filtration rate
HCG	Human chorionic gonadotropins
HELLP	Hemolysis, elevated liver enzymes, low platelets
HG	Hyperemesis gravidarum

HLA	Human leucocyte antigen
HUS	Hemolytic uremic syndrome
IgG	Immunoglobulin G
KDIGO	Kidney Disease Improving Global Outcomes
LCHAD	Long-chain 3-hydroxyacyl-CoA dehydrogenase
LDH	Lactate dehydrogenase
LN	Lupus nephritis
MAHA	Microangiopathic hemolytic anemia
MDRD	Modification of diet in renal disease
NICE	National institute of health and care excellence
PD	Peritoneal dialysis
PLGF	Placental growth factor
PPH	Postpartum hemorrhage
PRAKI	Pregnancy related acute kidney injury
P-TMA	Pregnancy related thrombotic microangiopathy
RDS	Respiratory distress syndrome
RRT	Renal replacement therapy
sflt-1	Soluble fms like tyrosine kinase-1
SGA	Small for gestational age
SLE	Systemic lupus erythematosis
SLED	Slow low efficiency dialysis
TMA	Thrombotic microangiopathy
TSH	Thyroid stimulating hormone
TTP	Thrombotic thrombocytopenic purpura
UF	Ultrafiltration
UTI	Urinary tract infection
VEGF	Vascular endothelial growth factor
WHO	World Health Organization

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Introduction

Pregnancy-related acute kidney injury (PRAKI) includes all of the causes of sudden decline of renal function occurring during pregnancy or postpartum. The incidence and etiology of PRAKI varies greatly between different regions. ***(Bouaziz M et al., 2013).***

Data for the prevalence and prognosis cannot be interpreted without taking into account the geographic and economic context of the country in which they have been obtained. In developed countries, obstetric AKI has become a rare complication of pregnancy. However, in developing countries, AKI remains a frequent and grave complication of pregnancy. ***(Ansari MR et al., 2008).***

Acute kidney injury (AKI) is a clinical syndrome denoted by an abrupt decline in glomerular filtration rate (GFR) sufficient to decrease the elimination of nitrogenous waste products (urea and creatinine) and other uremic toxins. ***(Jefferson A et al., 2010).***

Usually the development of AKI during pregnancy follows a bimodal distribution with two incidence peaks: one in the first trimester caused by septic abortion and the other in the third trimester due to late obstetric complications such as uterine hemorrhages, preeclampsia, hemolysis, elevated liver enzymes, low platelet (HELLP) syndrome, acute fatty liver of pregnancy and Thrombotic Thrombocytopenic Purpura-Hemolytic Uremic Syndrome. ***(Prakash J et al., 2010).***

Several general categories of PRAKI can be delineated: hypovolemic, thrombotic microangiopathic, infectious and obstructive. ***(Bouman C et al., 2003).***

In pregnancy, the most common cause of volume depletion is obstetrical hemorrhage that can occur at any gestational age. In rare cases severe hypovolemia can result in pre-renal ischaemia and AKI. ***(Jewell D and Young G, 2003).***

While sepsis may cause AKI in multi factorial manner; intra renal hemodynamic changes, endothelial dysfunction, infiltration of renal parenchyma by inflammatory cells, activation of mediators, intraglomerular thrombosis and tubular obstruction with necrotic debris may all play some part. ***(Zarjou A and Agarwal A, 2011).***

The common infections causing sepsis in pregnancy in developing countries are septic abortion, pyelonephritis, and postpartum fever. ***(Prakash J et al., 2010).***

In a retrospective study over an 11-year period, of 1,321 women, about 1% of all pregnancies required intensive care unit admission and 52 of them (4%) had severe sepsis or septic shock. ***(Pactitis S et al., 2007).***

In advanced gestation, AKI is most commonly associated with preeclampsia or abruptio placentae. An important differential diagnosis is that of acute kidney injury in late pregnancy in association with microangiopathic hemolytic anemia & thrombocytopenia. There are two main entities that must be considered: Thrombotic Thrombocytopenic Purpura-Hemolytic Uremic Syndrome (TTP-HUS) and severe preeclampsia, usually with the HELLP syndrome. Postpartum renal failure is a specific entity and may be considered as a form of hemolytic-uremic syndrome occurring in the postpartum period. ***(Vesely SK et al., 2004).***

It is postulated that all these diseases are manifestations of thrombotic microangiopathy caused by endothelial injury due to deficiency of nitric oxide-dependent endothelial relaxing factors. ***(Sibai BM et al., 1994).***

The gravid uterus can cause significant compression of the genitourinary system particularly in settings of uterine over distention such as polyhydramnios, multiple gestation or uterine fibroids. ***(Gammill HS and Jeyabalan A, 2005).***

Among these causes, acute tubular necrosis (ATN) is the most common pathological lesion but it has excellent prognosis as compared to other pathological lesions associated with eclampsia, HELLP syndrome, disseminated intravascular coagulation (DIC) and HUS in which glomerular involvement is predominant. ***(Schrier RW, 2001).***

Acute tubular necrosis in late pregnancy most commonly results from preeclampsia but it can also be caused by uterine hemorrhage with abruptio placentae. It should be suspected from the clinical situation and confirmed by urine analysis with granular casts and an elevated fractional excretion of sodium. ***(Fakhouri F et al., 2012).***

The physiologic changes in pregnancy make diagnosis of AKI during pregnancy a diagnostic and management challenge. Timely identification of "at-risk" individuals and treatment of underlying conditions remains the cornerstone of management. Questions regarding renal replacement therapy such as modality, optimal prescription and timing of initiation in PRAKI remain unclear. Understanding of the dynamics of AKI in pregnancy resulted in better management strategies. ***(Bentata Y et al., 2012).***

Currently, cases that are severe enough to require dialysis occur in fewer than one in 20,000 pregnancies, although complications with transient mild to moderate GFR decrease occur in approximately one in 8000 deliveries. ***(Hussein W and Lafayette RA, 2014).***

AKI in pregnancy bears a high risk of bilateral renal cortical necrosis and consequently chronic renal failure. Obstetric complications that are the most common cause of renal cortical necrosis include abruptio placentae, septic abortion, preeclampsia, postpartum hemorrhage and puerperal sepsis. ***(Goplani KR et al., 2008).***

The presence of AKI increases the mortality associated with any primary disease. ***(Murugan R and Kellum JA, 2011)***, the overall mortality rate associated with AKI is 20%, and those requiring renal replacement therapy (RRT) have a mortality rate approaching 50%. It has traditionally been thought that patients who do survive ultimately recover renal function; however, population-based studies suggest that a strikingly large percentage of patients who have AKI require permanent RRT or do not fully recover renal function. ***(Metnitz PG et al., 2002).***