ORIGINAL ARTICLE

Acute Renal Failure in Pregnancy: One Year Observational Study at Nephrology Department Sandeman Provincial Hospital Quetta

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ABSTRACT

Objective: To determine the incidence of pregnancy related acute renal failure, clinical spectrum, mortality and morbidity of this preventable complication of pregnancy.

Methods: An observational and prospective hospital based study was conducted at a territory care hospital in Quetta for one year from July 2008 to June 2009 .Total 140 patients of ARF were admitted in nephrology ward during this specific period of whom 54 were of obstetrical related ARF and they were included in the study . A predesigned proforma was used. The clinical history was noted and all under went a clinical examination .The vitals and urine out put was recorded regularly .Routine laboratory tests were performed and specialized test as DTPA scan, D dimers were done in some cases .The final out come was recorded . The majority of 32 patients were from rural area of Balochistan province, neighbour country Afghanistan and the remaining 22 were from Quetta, Pashine and Mustung Cities.

Results: Obstetrical related acute renal failure number 54 (39%) of which 30 (56%) were multipara and 24(44%) were primigravida. Their ages were between 18-42 years. Majority 32(59%) patients had not received any antenatal care and there was a history of traditional birth attendants assisted home delivery as compared to 7(13%) cases with adequate ante natal 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 causing hypotension due to postpartum hemorrhage and ante-partum hemorrhage was the commonest cause of acute renal failure. Clinical spectrum of pregnancy related acute renal failure showed ante-partum hemorrhage in 11(20%) cases, postpartum hemorrhage 14(25%) cases, puerperal sepsis and septic abortion and disseminated intravascular coagulation in 18(33%) cases, intrauterine disease 7(13%) and pre-eclamsia, eclampsia, hemolysis, elevated liver enzyme, low platelets syndrome in 4 (7%) cases. 44 (81%) patients received hemodialysis and 10(19%) did not require hemodialysis. Commonest clinical diagnosis was acute tubular necrosis in 33(61%) cases with complete recovery. Acute renal cortical necrosis was seen in 11 (22%) cases.

Conclusion: Pregnancy related acute renal failure is a major health problem especially in the rural areas of Balochistan province, neighbor country Afghanistan and carries very high mortality and morbidity. Lack of antenatal health care clinics, poor health facilities and late referrals are major identified causes.

Key words: Acute renal failure, Ante-partum hemorrhage, Hemodialysis

INTRDOCUTION

Pregnancy related acute renal failure is one of the most common causes of acute renal failure (ARF). Acute renal failure may be defined as a sudden decrease in renal function which is usually reversible, over a period of several hours to days sufficient enough to result in retention of nitrogenous waste products (i.e. Blood urea nitrogen (BUN) and creatinine) in the body. Over last seven decades several important causes of pregnancy induced ARF and its pathophysiological mechanism have been described. ARF can occur during antenatal and post natal period of pregnancy. The important causes of pregnancy related ARF are divided into (1) causes during early pregnancy which may include septic abortion leading to septic shock and acute tubular necrosis and (2) causes in late pregnancy i.e. after 34 weeks of gestation and immediate puerperium are ante-partum hemorrhage (APH), abruption placentae, postpartum hemorrhage (PPH), hemolytic uremic syndrome (HUS), hemolysis, elevated liver enzyme, low platelets (HELLP) Syndrome), pre-eclampsia, puerperal sepsis and hemlysis. Among these causes acute tubular necrosis (ATN) is the most common pathological lesion, but it has excellent prognosis as compare to other pathological lesions associated with eclampsia, HELLP syndrome, disseminated intravascular coagulation (DIC), and HUS, in which glomerulor involvement is predominant.[1,2] But in case of septic abortion leading to ATN the mortality is high

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f the causative organism was clostridium.[2] It is postulated that all these diseases are manifestations of thrombotic microangiopathy caused by endow thelial injury, due to deficiency of NO-dependant endowthelial relaxing factors[3]. The bad prognostic lesion seen in pregnancy induced acute renal failure is acute bilateral renal cortical necrosis (BCN). It is rarely seen on industrialized nations.[4] The other bad prognostic lesion seen in obstetric induced ARF are HUS, severe form of eclampsia and HELLP syndrome, majority of the patients require maintenance dialysis or survive with markedly reduced renal functions, ARF that is severe enough to require dialysis is quite rare in industrialized nations, its incidence is 1:20000 or less of all gestations[1,2]. These statistics show significant improvement as compared to the situation in 1950, and 1960, when as many as 22% of all the cases of acute renal failure were of obstetrical origin with mortality rate ranging from 20-48%[5]. This achievement in industrialized nations is most likely due to liberalization of abortion laws, improved prenatal care and bettor management of maternal complications potentially leading to ARF.[6] On the other hand the incidence of cortical necrosis is still very high developing countries, in Pakistan it is about 13% as reported by Ramzan et al[7], and about 24% in India as reported by Parkash et al[8] It is frequently seen after APH, prolonged retention of dead fetus[2,6,9].

There is also incomplete (patchy) cortical necrosis followed by a variable improvement of renal function and a stable period of moderate renal insufficiency over a few years, and in some cases it may progress to end stage renal disease few years later[4] The incidence of pregnancy related ARF in developing countries like Pakistan has not significantly changed. There is no such local data available in the past to compare with only some scanty available articles which showed pregnancy related acute renal failure 7-10%[10]. Mortality in pregnancy related renal failure depends on underlying renal lesion and associated complications. It is high when associated severe preeclamsia, HELLP syndrome, and acute fatty liver of pregnancy, sepsis, DIC, HUS and cortical necrosis.

The aim of this study was to know the magnitude of the problem leading to high mortality, morbidity. Obstetric renal failure is a changing health problem of Pakistani population especially of rural areas.

PATIENTS AND METHODS

This study was conducted in the department of Nephrology department Sandeman provincial civil hospital Quetta from July 2008 to June 2009. It was an observational study. During this one year period 140 patients suffering from acute renal failure were admitted in nephrology ward. Out of these, 54 patients were pregnancy induced acute renal failure and were referred from interior of Balochistan province, Afghanistan and obstetrical wards of different hospitals of Quetta City. All patients suffering from pregnancy related ARF were enrolled in the study. Their complete history, clinical examination, all the necessary lab investigations and intake urine out put was recorded in separate proforma. Ultrasonography was done in all patients. Specialized investigation like DTPA renal scan and renal biopsies were performed in selected cases where recovery was delayed for more than 3 weeks. Hemodialysis was done as a part of treatment when indicated. Conservative treatment included all therapeutics modalities available as management of fluids, diuretics, electrolytes, blood transfusion, antihypertensive and antibiotics. Recovery from ARF was declared when renal function returned to normal range. Partial recovery due to patchy cortical necrosis was suspected when renal functions showed improvement but did not return to normal even after 12 weeks. Cortical necrosis was diagnosed when patient remained anuric for more than 3 week and DTPA renal scan showed very poor bilateral renal perfusion, renal ultrasound showed Bilateral increased echogenicity with small size kidneys and scattered renal cortical calcification, and the patients remained dialysis dependents. A gold standard technique for diagnosis of cortical necrosis is renal angiography, but it could not be done due to lack of facility.

RESULTS

During the period July 2008 till June 2009 total 140 cases of acute renal failure with different etiologies were admitted in Nephrology Dept, S.P hospital. The ages of the patients were between 18-42 years .Out of these 140 patients 54 (39%) were of obstetrical related ARF. 30 (56%) were multipara and 24 (44%) were primigravida. Acute renal failure occurred in 9(17%) cases in early part of their pregnancy (first trimester) where as in 45(83%) cases in later period of pregnancy i.e. 3rd trimester and puerperium. Majority 32(59%) patients had not received any antenatal care at any stage of pregnancy and had under gone traditional birth attendant (Dai) assisted home delivary, 22 (41%) patients had delivered in the hospital but with out antenatal care. There were 17 (31%) patients who had undergone major surgical procedures like C-section or caesariam hysterectomg where as 37 (69%) had vaginal deliveries. 32 (59%) cases were from interior of Balochistan, Sindh, Afghanistan and 22 (41%) were residents of Quetta, Pishin and Mustung cities. Hemodialysis was done in

44(81%) patients. 10(19%) patients were not dialysed. Out of these 10 patients, 4 were recovered normal renal functions with conservative treatment, 4 of them were in shock and 4 patients relative refused dialysis. Anuria was observed in 20(37%) cases, remaining 34(63%) patients presented with decreased urinary volume or oliguria. Blood loss due to APH causing hypotension was the commonest cause of ARF in our study. Sepsis, Disseminated intravascular coagulation, intra uterine death, HELLP syndrome (Hemolysis, elevated liver enzymes, and low platelets) and pre eclampsia were also the commonest causes in order of frequency. The commonest clinical diagnosis was acute tubular necrosis (ATN) in 33(61%) cases. Complete recovery was observed in 33 (61%) patients. 12(22%) patients developed irreversible renal failure, where as 11 (22%) developed Bilateral cortical necrosis due to APH, sepsis and DIC. Renal Biopsy was done in 7 (13%) cases, which showed tubular necrotic changes and diffuse glomerular capillary necrosis in 5 specimen (acute cortical necrosis) and two Biopsy reports showed patchy cortical necrosis out of these 12 patients who developed irreversible renal failure 5 are now on maintenance hemodialysis. 5 patients died and two developed chronic kidney disease and were on conservative treatment with creatinine clearance between 20-35ml/min 5 patients died. Septicaemia with multi-organ failure, hyperkalaemia pulmonary oedema were the common causes of mortality. The spectrum of pregnancy related acute renal failure 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

Obstetrical acute renal failure is now a very rare entity in the developed countries. Its incidence is less than 1:20000 of all gestations[1,2]. But our data presented in this study on pregnancy related acute renal failure (39%) in one year period. Situation in some of the developing countries likes South Africa, India, and Turkey has shown improvement. Chugh et al[11] from India reported declining incidence from 22% in 1965-1974 to 9% in 1981-1986. In South Africa incidence of pregnancy induced ARF has declined from 25% in 1978 to less than 16% in 1992[12].

In Turkey the situation has also improved from 17% in early 80% to 13% in 1997[13]. On the other hand in developed countries the obstetrical ARF is now a very rare entity. Strata et al[14] quoted the incidence of obstetrical ARF to decrease from 43% (1956-1967) to 0.5% with respect to total ARF cases (1988-1994) and no case of maternal death or irreversible renal damage was observed in last eight years. The reported data from various studies of the country showed very high incidence of mortality 18% to 23%) and morbidity (13% to 26%) related to obstetrical ARF[10,15].

One striking feature of this study indicated that the pregnancy related ARF is more commonly seen (60%) in patients who had not received any kind of antenatal care and their deliveries were carried out at home assisted by dai with out aseptic measures. In the hospital it is also reported that the women delivered there also not having received antenatal care was more prone to developed ARF 16 (30%). This figure indicates the importance of antenatal care in the prevention of pregnancy related ARF. The industrialized Nation and some of the developing countries have achieved these goals by liberalization of abortion laws, improved health care facilities and more effective measures of care full prevention. Data from Pakistan on pregnancy related ARF is scanty. In 2008, Ansari et al[16] reported 36% obstetrical ARF from Hyderabad and interior Sindh province with over all morbidity of 19% and mortality of 26%. In 1996, Naqvi et al[15] reported 18% obstetrical ARF from Karachi city with 23% mortality and 26% morbidity. Which has the maximum health care facilities compared to the rest of the country. In Northern areas, obstetrical ARF was reported to be 7-10% of total ARF cases and mortality was 18%.[10] These figures indicate very high incidence of pregnancy related ARF in Pakistan. If we compare our data with rest of the country it indicates an alarming high frequency of pregnancy related ARF in Balochistan province and Afghanistan. This indicates the failure of health care facilities especially antenatal care in the interior of province.

CONCLUSION

Our study shows the obstetrical ARF in one of the most common causes of acute renal failure, which is now in a rare entity in developed and some developing countries. It is also a dangerous complication of pregnancy which has very high mortality and morbidity. These calls for an improvement in the existing health care facilities, transport facilities, earlier referral and public awareness programmers, better care in the public sector hospital and special training to TBA.

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