

RENAL LESIONS IN OBSTETRIC DEATHS -- AN AUTOPSY STUDY

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SUMMARY

One percent of total autopsies performed from the year 1979-1987 belonged to pregnant women. Renal lesions in relation to various obstetric complications were assessed. In 50% of cases renal lesions were observed, 64 percent of these lesions were major and specific to the obstetric complications. These included toxæmia of pregnancy, disseminated intravascular coagulation (DIC) and renal cortical necrosis (RCN). Mesangiolysis was a histological feature observed in these three condition in varying degree of severity. It was present in very few glomeruli in toxæmia of pregnancy, segmental glomerular involvement in both toxæmia and DIC and more diffuse in RCN. We speculate that DIC has the triggering mechanism for these pathologic renal changes to occur, as evidenced by mesangiolysis in these three conditions i.e. toxæmia, DIC & RCN.

INTRODUCTION

Maternal deaths following child birth have decreased remarkably in the latter half of the present century in west, In U.S.A., the maternal death rate is reported to be 8-9 per 1000,000. (Bellor1974) However, there is a threefold difference in maternal mortality that exists between the white and black women which appear to be due to social & economic

factors (Pritchard 1985). In India, the maternal mortality continues to be still very high in comparison to the developed countries as revealed by the census of 1981 (Medappa,1984).

Many clinical syndromes in pregnancy can be explained by a chronic or acute, diffuse or local coagulative process where kidney is the major organ to reveal the histological evidence (Beller, 1974). Thus involvement of kidney in pregnancy is commonly observed at various stages of pregnancy, In this paper we

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correlate the renal lesions associated with various obstetric complications with an object of understanding the underlying pathological mechanism and analyse the incidence and pattern of renal involvement.

MATERIAL & METHODS

Of 8247 autopsies, seven hundred and ninety three were women of child bearing age, in 83 cases of death pregnancy was associated. Data regarding age, parity/gravida, and obstetric findings were documented from the clinical notes. On the basis of clinical grounds the cases were grouped as

1. Gestational period less than 24 weeks - 19 cases.
2. Ante partum and post partum haemorrhage (APH & PPH) - 19 cases.
3. Toxaemia of pregnancy - 18 cases.
4. Post partal deaths (which included mainly uterine rupture and puerperal sepsis) - 16 cases.

5. Lower Segment Caesarean Section (L.S.C.S.) - 6 cases.

6. Non obstetric complications - 5 cases.

Renal lesions were analysed in relation to these different groups. Tissues were fixed in 10 percent buffered formalin and five micron thick sections were cut and stained with haematoxylin & eosin. Martius scarlet blue stain (MSB) was done for fibrin (Lendrum 1962). Fibrin deposit was graded as mild when less than ten thrombi were seen per section within glomeruli or arteries. The method was adopted after Brain et al with little modification suitable for our sections (Brain et al 1967). Periodic acid silver methanamine (PASM) stain was carried out to demonstrate changes in the glomerular basement membrane (GBM) (Preece, 1972).

OBSERVATION

Clinical and obstetric features and corresponding renal lesions in these patients are shown in table I and table II.

TABLE I

Clinical and Obstetric findings in relation to obstetric complications

	Gestation 24 weeks	APH' PPH	Post partal Deaths	Toxaemia	L.SCS
Total No.	19	19	16	18	6
No. of cases					
< 22 years of age	4	1	3	9	1
No. of Primi	4	1	4	15	2
No. of Multipara 5 or +	-	5	2	-	2
No. of Home Deliveries	-	2	8	-	-
No. of abnormal Pregnancies	E ₅ P ₁ T ₂	P ₃	M ₁	P ₁ &T ₂	

+ : more, E: Ectopic, P: Abnormal Placenta, T: Twins, < : Less than, M : Molar pregnancy

TABLE II

Distribution of Renal lesions in various obstetric complications

	Gestation 24 weeks	APH PPH	Post partal Deaths	Toxaemia	L.S.C.S.	Total No. of cases
No. of cases of Vacuolar degeneration	1	1	1	-	-	3
No. of cases of ATN	1	4	1	-	-	6
No of cases of APN	1	-	2	-	1	4
No. of cases of D.I.C.	1	3	-	-	4	8
No. of cases of Toxaemia	-	-	-	16	-	18
No. of cases of R.C.N.	1	1	1	-	-	3
Total No. of	19	19	16	18	6	42/78

Clinico-Pathological Correlation

Vacuolar degeneration was seen in three cases. One of them had severe hyperemesis leading to spontaneous abortion. The histological lesion was mainly observed in the proximal convoluted tubules, characterised by swollen vacuolar cytoplasm of tubular epithelial cells.

Acute tubular necrosis (ATN) - Acute tubular necrosis was observed in four cases of ante/post partum haemorrhage and one each case of abortion and uterine rupture leading to hypovolaemic shock.

Acute pyelonephritis (APN) was found in two cases of puerperal sepsis and one in each case following abortion and L.S.C.S.

Disseminated intravascular coagulation - All these eight patients had prolonged bleed-

ing & clotting time, thrombocytopenia, hypofibrinogenaemia. In four patients fibrinogen degradation products were detected in the blood. Four of eight women following L.S.C.S. had bleeding from various needle puncture sites. At autopsy puerperic spots and ecchymoses were observed. Subpleural, subpericardial and intrapelvic haemorrhages in kidney were observed along with retroperitoneal haematomas and intrauterine haemorrhages.

Histological lesions in these cases are shown in table III. Almost in all cases haematoxylin & eosin stain revealed fragmented erythrocytes and exudation of plasma in Bowman's space. Mesangiolytic was present in all cases but its distribution varied from 10-80 percent of the glomeruli. The lesions were mainly segmental, however in some

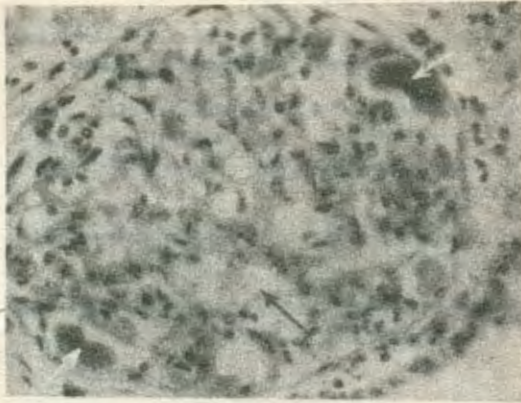


Figure 1

A Glomerulus showing fibrin thrombi (white arrows) and mesangiolytic changes (black arrows) Haematoxylin and eosin (X 400).

glomeruli more than one segment was involved. The deposition of fibrin was seen mainly in glomeruli and occasionally in afferent arterioles (fig.1). P.A.S.M.stain revealed dilated capillary loops as a result of mesangiolytic changes

Toxaemia of pregnancy -All eighteen patients in this group had moderate to severe hypertension and albuminuria and had two or more convulsions prior to death. Multiple endocrine neoplasia and non-specific aortoarteritis causing renal artery stenosis were the causes of hypertension in two females. Histology of the kidney in the first case showed lesions of benign nephrosclerosis and in the second case affected kidney showed multiple areas of ischaemic atrophy with glomerular obsolescence. The haematoxylin & eosin stain in the remaining cases revealed club shaped solid bloodless glomeruli. Another diffuse change was increase in collagen fibre deposition on endothelium as evident in PASM. Apart from these common changes of primary hypertension of pregnancy, in four cases lesions of mesangiolytic changes were seen in

about 10 percent of glomeruli. All these four women developed D.I.C. terminally before death.

Renal cortical necrosis (R.C.N.) -All the three patients had acute renal failure, one each was following spontaneous abortion after amniocentesis, still born delivery and a normal delivery. In all these cases, the gross appearance of the kidneys showed extensive renal cortical necrosis. Histology confirmed extensive cortical necrosis sparing the subcapsular and juxta medullary nephrons. The small as well as large sized arteries showed fibrinoid necrosis. Both glomeruli and arteries showed fibrin thrombi. The PASM stain revealed evidence of mesangiolytic changes which affected all glomeruli in necrotic region and was more diffuse in an individual glomerular tuft.

Fragmented red blood cells in Bowman's space, dilated capillary loops are the subsequent effects of mesangiolytic changes. Thus mesangiolytic changes can be considered as evidence of D.I.C. The etiology of H.U.S. also implicates an initial vascular injury triggering localised type of D.I.C. involving the kidney (Churg 1979). The etiology of eclampsia is accepted to be miniature type of D.I.C. (Beller 1974). Thus three major renal complications were related to D.I.C. The hypercoagulable state during puerperium predisposed to D.I.C. which has been stressed number of times (Brain 1967, Woodfield 1968).

A timely diagnosis of D.I.C. during pregnancy may be helpful to prevent fatal renal complications during pregnancy.

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