

## The Association of Proteinuria and Serum Creatinine in Eclampsia Patients: a Cross Sectional Study

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### Abstract

### Original Research Article

**Objective:** in this study our main goal to evaluate the sociodemographic status of patients in displaced bicondylar intra articular fractures of the distal humerus. **Methodology:** This perspective and randomized study was conducted at the National Institute of Traumatology and Orthopaedic Rehabilitation (NITOR), Dhaka from July 2003 to 2005. Where out of 24 patients 12 were selected for operative treatment by reconstruction plate and screws (Group –I), and 12 were selected for operative treatment by double tension band wiring (Group-II) as on random basis. **Result:** during the study, where in group-1 male and female percentage were equal, 50%, where as in group-2 41.67% were male and 58.33% were female. Most of the patients had clinical follow-up by 6 months, 50% and 66.67%. In group-1 58.33% patients had injury by falling whereas, in group-2, it was 75%. **Conclusion:** From our study we can conclude that, personal awareness, anatomic surgical reconstruction, and postoperative care should be performed correctly for management of in displaced bicondylar intra articular fractures of the distal humerus. Further study is needed for better outcome.

**Keywords:** Double tension band wiring, Reconstruction plate and screws, displaced bicondylar intra articular fractures.

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## INTRODUCTION

Eclampsia is a potentially fatal disorder of pregnant women that has been prevalent since the time of Hippocrates; it remains an important cause of maternal mortality throughout the world. Eclampsia is the occurrence of generalized tonic clonic convulsion usually in association with hypertension and proteinuria after 20 weeks of pregnancy in previously normotensive and non proteinuric women [1]. Eclampsia account for 12% of global maternal deaths. Every year 63000 women die of eclampsia and preeclampsia and 99% of these deaths occur in low income countries [2].

Eclampsia is a sequel of preeclampsia which is a multisystem disorder of unknown etiology. Recently, extra ordinary progress has been made in adding to our understanding of the molecular mechanism of preeclampsia. There is abnormal placentation or other causes of aberrant placental vascular development as the initiating event, which lead to placental hypoxia and

subsequently triggers the release of placenta derived factors in to maternal circulation. Consequently, these factors most of which have anti-angiogenic properties, causes damage to the micro vascular endothelium by altering local angiogenic and vasodilatory signal<sup>3</sup>. Ultimately proteinuria and hypertension develop. Creatinine is a muscle metabolic product excreted by the kidney in the urine. When formed, creatinine diffuse passively in to the blood stream, then it is removed by glomerular filtration action of the kidney, thus the level of creatinine in the blood stream is reasonably constant. Creatinine is not reabsorbed in the renal tubule and not affected by protein intake. In this study our main goal is to evaluate the association of proteinuria and serum creatinine in eclampsia patients.

## OBJECTIVE

### General objective

- To assess the association of proteinuria and serum creatinine in eclampsia patients.

**Specific objective**

- To identify types of eclampsia of the patients
- To detect statistics of serum creatinine according to renal function status among preeclampsia group

**METHODOLOGY****Study Type**

- This was a hospital based cross sectional comparative study.

**Study place and period**

- This cross sectional study was conducted at inpatient department of Obstetrics & Gynaecology, Chittagong Medical College Hospital from one year (July 2012 - June 2013)

**Study population**

- A total of 15862 patients were admitted in inpatient department of Obst. & Gynae at CMCH. Out of 365 eclampsia (ante partum/ intra partum/ postpartum) 50 eclampsia patients were selected as case and 50 low risk pregnancy selected as control group.

**Sampling technique**

- Purposive Sampling technique was performed during the study.

**Sample size**

In the study assumed that 50% of eclampsia patient has impaired renal function and using the precision 10%. So the following formula can be applied to calculate the sample size.

$$Z \frac{2pq}{e}$$

Where  $z = 1.96$

$p = 50\% = .50$

$q = 1 - P = 1 - .50 = .50$

$e = 10\% \text{ precision}$

$$(1.96)^2 \frac{.50 \times .50}{.10}$$

$n =$

$$= 96.0 (0.1)^2$$

$= 100$

But following inclusion and exclusion criteria during study period 50 patients were taken.

**Inclusion criteria**

- 50 diagnosed case of eclampsia (antepartum/ intrapartum/ postpartum) and 50 normotensive normal pregnant women.

**Exclusion criteria**

- Known case of hypertension.
- Diabetes Mellitus
- Chronic renal disease

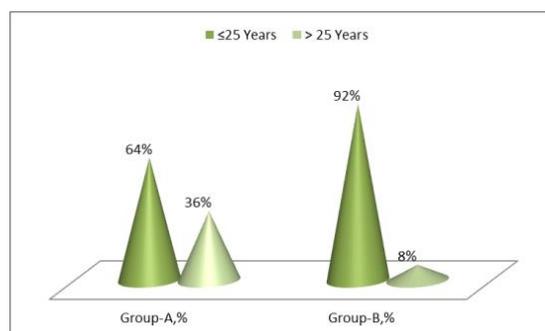
- Other cause of renal failure (acute fatty liver, thrombotic thrombocytopenia)
- Epilepsy
- Urinary tract infection
- Congestive cardiac failure.
- Lupus Nephritis
- Multiple myeloma
- Amyloidosis

**Data collection and analysis**

- Data will be collection in predesigned data collection sheet using various parameters. Interviews conducted using direct questionnaire and all information will be noted in pre from data collection sheet. Data were compiled and appropriate statistical package for social science (SPSS). Qualitative data are summarized by ratio and percentage. Quantitative data are concise by mean and standard deviation (SD). Chi square ( $X^2$ ) and Unpaired t-test were used to assess the significance of Quantitative data respectively.

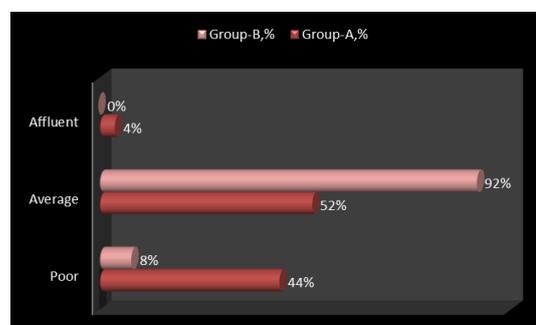
**RESULT**

In figure-1 shows age distribution of the patients where in group-A and in group-B most 64% and 92% of the patients belongs to  $\leq 25$  Years age group. The following table is given below in detail:



**Fig-1: Age distribution of the patients.**

In figure-2 shows socioeconomic condition of the patients where most of the patients in group-A and B, belong to average economic condition, the following figure is given below in detail:



**Fig-2: Socioeconomic condition of the patients**

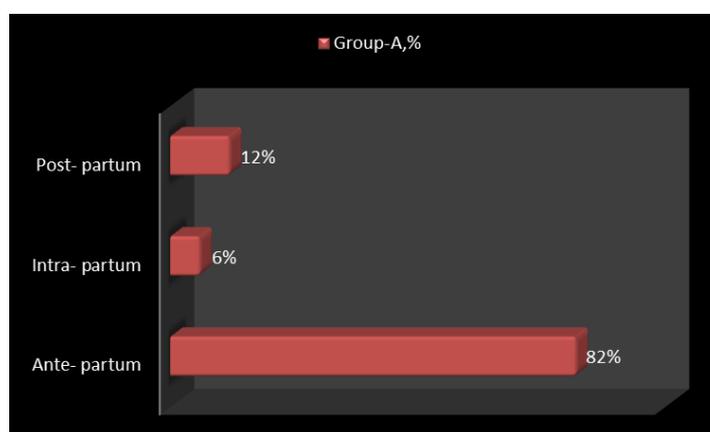
In table-1 shows demographic profile of the patients where in group-A 60% patients belong from

rural where as in group-B only 30% patients belong from rural. The following table is given below in detail:

**Table-1: Demographic profile of the patients**

Socio-demographic variables		Group A (n = 50)		Group B (n = 50)		Total	
		n	%	n	%	n	%
Community	Muslim	37	74.0	30	60.0	67	67.0
	Hindu	10	20.0	15	30.0	25	25.0
	Buddhist	03	6.0	05	10.0	08	8.0
Habitat	Urban	16	32.0	32	64.0	48	48.0
	Rural	25	50.0	15	30.0	40	40.0
	Slum	09	18.0	03	6.0	12	12.0
Occupation	House Wife	43	86.0	38	76.0	81	81.0
	Service Holder	07	14.0	12	24.0	19	19.0
Educational Status	Illiterate	12	24.0	02	4.0	14	14.0
	Primary	21	42.0	08	16.0	29	29.0
	Secondary	17	34.0	33	66.0	50	50.0
	Higher Secondary	00	0.0	07	14.0	07	7.0
	& Above						

In figure-3 shows types of eclampsia in group-A, where majority are antepartum eclampsia 82% (n = 50). The following figure will be given below in detail:



**Fig-3: Types of eclampsia in group-A**

In table-2 shows statistics of serum creatinine according to renal function status among eclampsia group A (n = 50) (with t-test significance) where

statistics of serum creatinine according to renal function status which is highly significant (P = 0.000). The following table is given below in detail:

**Table-2: Statistics of serum creatinine according to renal function status among preeclampsia group A (n = 50) (with t-test significance)**

Variable	Renal Function Status	N	MEAN	□ SD	MEDIAN	RANGE	SIGN.*
Serum Creatinine (mg/dl)	Normal	21	0.88	0.18	1.00	0.7-1.2	t = 10.449
	Impaired	29	2.12	0.55	2.00	1.3-3.3	P = 0.000
TOTAL		50	1.64	0.72	1.50	0.7-3.3	HS

Where,

- Independent samples t-test. HS= Highly Significant (P <0.001)

In table-2 shows statistics of blood pressure according to renal function status among eclampsia group A (n = 50) (with t-test significance) where result was highly significant both in systolic and diastolic. The following table is given below in detail:

**Table-2: Statistics of blood pressure according to renal function status among preeclampsia group A (n = 50) (with t-test significance)**

Variable	Renal Function Status	N	MEAN	SD	MEDIAN	RANGE	SIGN.*
Systolic Blood Pressure (mmHg)	Normal	21	143.81	5.90	140.00	140-160	t = 6.802
	Impaired	29	162.41	13.00	160.00	140-180	P = 0.000
	TOTAL	50	154.60	14.03	150.00	140-180	HS
Diastolic Blood Pressure (mmHg)	Normal	21	108.57	5.73	110.00	100-120	t = 2.496
	Impaired	29	113.28	7.59	115.00	100-120	P = 0.016
	TOTAL	50	111.30	7.20	110.00	100-120	HS

Where,

- Independent samples t-test. S = Significant (P < 0.05); HS = Significant (P < 0.001).

In table-3 shows distribution of selected variables according to renal function status among eclampsia group A (n = 50) (with X<sup>2</sup>-test significance) where especially among > 25 years, multi gravida low S.E. class, irregular antenatal care proteinuria 3+ (P = 0.034, 0.000, 0.014, 0.019 & 0.006 respectively) and significant. The following table is given below in detail:

**Table-3: Distribution of selected variables according to renal function status among eclampsia group A (n = 50) (with X<sup>2</sup>-test significance)**

Variable		Renal Function Status						X <sup>2</sup> Test Significance
		Normal (N = 21)		Impaired (N=29)		Total (n = 50)		
		n	%	n	%	n	%	
Age Groups	□ 25 Years	17	81.0	15	51.7	32	64.0	X <sup>2</sup> = 4.516 P = 0.034 <sup>S</sup>
	□ 25 Years	4	19.0	14	48.3	18	36.0	
Gravidity	Primi-gravida Multi-gravida	20	95.2	10	34.5	30	60.0	X <sup>2</sup> = 5.990 P = 0.000 <sup>HS</sup>
		1	4.8	19	65.5	20	40.0	
Socio-Economic Condition	Poor Average	5	23.8	17	58.6	22	44.0	X <sup>2</sup> = 5.990 P = 0.014 <sup>S</sup>
		16	76.2	12	41.4	28	56.0	
Antenatal Check-up (ANC)	Regular Irregular	15	17.4	11	37.9	26	52.0	X <sup>2</sup> = 5.476 P = 0.019 <sup>S</sup>
		6	28.6	18	62.	24	48.0	
Proteinuria	+/++	14	66.7	8	27.6	22	44.0	X <sup>2</sup> = 7.550 P = 0.006 <sup>HS</sup>
	+++	7	33.3	21	72.4	28	56.0	

## DISCUSSION

This cross sectional comparative study was designed to assess proteinuria and renal function (s. creatinine) between eclampsia and low risk pregnancy in the inpatient department of Obst. & Gynae Chittagong Medical College and Hospital. Eclampsia is a fatal disorder of pregnancy which contributes 20% obstetric cause of maternal death and various morbidities.

The incidence of eclampsia in the present study period was 2.30% of the admitted cases of obstetric at CMCH. A study conducted in Dhaka Medical College Hospital (DMCH) where it was 9.38% of obstetric case [4]. This is the largest hospital and wide catchment area in Bangladesh. There was wide variation of incidence (4-9%) observed in deferent studies [4-6].

From our study, generally it was seen that patient from higher income group go to private sector hospital and lower income group come to government hospital. A definite conclusion can't be made regarding

socio economic condition as this study was in government hospital. However it was seen that the socio economic status has inverse relationship with the incidence of eclampsia [7].

Regarding blood pressure, both systolic and diastolic blood pressure is significantly higher (P = 0.000) among study group eclampsia than control group.

Mean systolic blood pressure is 154.60±14.03 mmHg in eclampsia patient and it is 116.30±6.29 mmHg in low risk pregnancy. Mean diastolic blood pressure in 111.30±7.20 mmHg in eclampsia patients while 73.20 ±4.71 mmHg in the control group.

Similar finding was observed by other investigator [4]. There is highly significant difference in both systolic and diastolic blood pressure between impaired renal function group of eclampsia patients and normal renal function group of eclampsia patients.

Mean systolic blood pressure is  $162.41 \pm 13.00$  mmHg in eclampsia patients with impaired renal function and it is  $143.81 \pm 5.90$  mmHg in eclampsia patient with normal renal function. Mean diastolic blood pressure is  $113.28 \pm 2.59$  mmHg VS  $108.57 \pm 5.73$  mmHg. In one study reported that systolic blood pressure was  $(168 \pm 23.0)$  mmHg and diastolic blood pressure was  $108 \pm 14.0$  mm Hg [7] and another study reported such difference [8].

Several studies during last decade have shown that women have had pre- eclamptic pregnancy have a statistically increase risk of later renal disease, possibly stronger association of preeclampsia with renal disease [9]. A pregnancy complicated by preeclampsia seems to provide a unique window into the future regarding renal risk. They therefore suggest that all women with a history of preeclampsia should be followed by their general practitioners and complicated cases should also collaborate with a nephrologist [10].

Another study shows Intergeneration factor: a missing link for eclampsia, fetal growth is an isolated risk factor for its association with other preexisting genetic, environmental and socioeconomic factors [11].

Another study stated that endothelial dysfunction on its contribution to the PE pathogenesis but also in its relationship with the increase risk of subsequent renal diseases [12].

## CONCLUSION

- From our study we can conclude that eclampsia patient's poses high risk in chance of occurrence proteinuria and renal function (s. creatinine) impairment. Regular medical consultation and consciousness are very much needed for management of these pregnancy complications.

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