Original Research Paper Medical Science

Accuracy of 12 Hours Urine Protein and 24 Hours Urine Protein in Predicting Proteinuria in Hypertensive Disorders of Pregnancy- A Comparitive Study

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ABSTRACT

Hypertensive disorders complicating pregnancies form one of the deadly triad along with haemorrhage and infections that results in much of maternal morbidity and mortality in pregnancy. Hypertensive disorders complicate 5-10% of all pregnancies. Pre eclampsia is diagnosed when hypertension and proteinuria occur after 20 weeks of gestation. Proteinuria is an important sign of pre eclampsia. Severity of pre eclampsia is also determined by the degree of proteinuria. Hence accurate and rapid quantification of proteinuria is essential for the diagnosis and management of hypertensive disorders. Routinely proteinuria is detected by urine dipstick method which is not accurate and there are false positive and negatives.The gold standard 24 hrs urine protein though accurate is time consuming and requires patient compliance which can be rectified by shorter collection(12hrs) which gives similar results.So we made a study with 100 pregnant women with gestational age >20 weeks with pre eclampsia and gestational hypertension in GOVT RSRM LYING IN hospital.Our study showed that 12hrs sample correlated with 24hours sample for patient with no proteinuria($p<0.001$),mild proteinuria($p<0.001$),severe proteinuria($p<0.001$) which is statistically significant. Hence, estimation of 12 hours urine protein is a satisfactory substitute for 24 hours urine protein measurement.

KEYWORDS

INTRODUCTION:

Hypertensive disorders during pregnancy are the commonest medical disorder during pregnancy and continue to be the most important cause of maternal and perinatal motality and morbidity worldwide. Hypertensive disorder complicates 5-10%of all pregnancies. To reduce the impact of preeclampsia on maternal mortality, it is necessary to establish early diagnosis and early intervention to prevent complications.

AIM OF THE STUDY: The objective of the study was to know if 12 hrs urine protein would provide an accurate quantification of proteinuria and whether it can replace the use of 24 hrs urine protein in hypertensive disorders of pregnancy.

METHODS:

STUDY DESIGN: PROSPECTIVE.

STUDY SAMPLE:100 Pregnant women >20weeks with pre eclampsia and gestational hypertension.

STUDY PLACE: GOVT. RSRM LYING - IN HOSPITAL.

STUDY PERIOD:AUG 2015-JULY2016

METHODOLOGY:

A qualitative urine test for protein done on random urine sample using dipstick method and graduated as:

Trace - 15mg/dl

1+ - 30mg/dl <0.5gm/day

2+ - 100mg/dl 0.5-1gm/day

3+ - 300mg/dl 1-2gm/day

4+ - 2gm/dl >2gm/day

Test has to be repeated and if it shows trace and above,a quantitative proteinuria estimation should be done.24 hours of urine should be collected 12 hours apart.

	12HRS URINE PROTEIN (mg/dl)	24HRS URINE PROTEIN (mg/dl)
NO PROTEINURIA	<165	<300
MILD PROTEINURIA	165-1650	300-3000
SEVERE PROTEINURIA	>1650	>3000

METHODS:

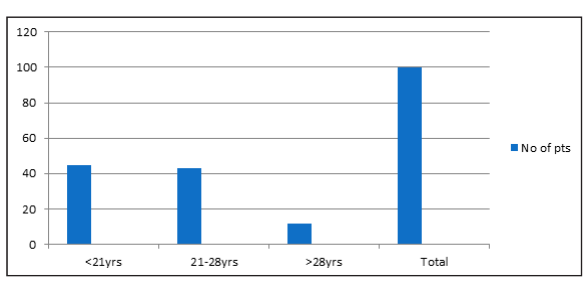
Pyrogallol red molybbdate method:

* Measure 24 hours urine volume in ml.
* Divide the volume by 100

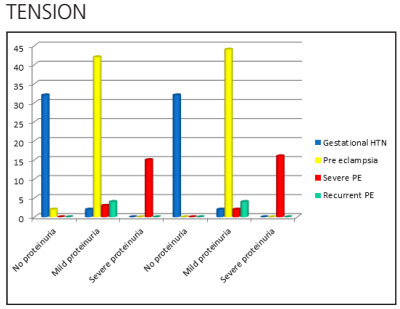
*24hrs urine volume in dl X protein concentration in mg/dl

* Resulting number is the amount of protein expressed as mg/dl.

AGE WISE DISTRIBUTION OF CASES:



CORRELATION BETWEEN 12 HOURS (1,2,3 BARS) AND 24 HOURS(4,5,6 BARS) URINE PROTEIN AND TYPES OF HYPERTENSION



STATISTICAL SIGNIFICANCE:

			24 HOURS URINE PROTEIN		TOTAL
			NORMAL	ABNORMAL	
12 HOURS URINE PROTEIN	NORMAL	COUNT	32	2	34
		% within 12 hrs urine protein	94.1%	5.9%	100%
		% within 24 hrs urine protein	98.1%	2.9%	34.0%
	ABNORMAL	COUNT	0	66	66
		% within 12 hrs urine protein	0.0%	99.0%	100%
		% within 24 hrs urine protein	0.0%	97.1%	66.0%
TOTAL		COUNT	32	68	100
		% within 12 hrs urine protein	32.0%	68.0%	100.0%
		% within 24 hrs urine protein	100.0%	100.0%	100.0%

The above table explains the statistical significance of the study comparing the accuracy of 12hrs urine protein with 24hrs urine protein in predicting proteinuria with a Sensitivity of 98.1%,Specificity of 97.1%.Positive predictive value of 94.1%,Negative predictive value 99%.

DISCUSSION :

In our study,100 patients with Hypertensives disorders of pregnancy were enrolled.In our Hospital the incidence of Pre eclampsia was 9.6%.

Age Incidence: Women of different age group were included in the study. Out of 100 patients 67% of them were in age group between 17-21 & >28years. This shows a J shaped curve between the relationship of maternal age & incidence of hypertensives disorders of pregnancy,which were similar in other studies also.

Parity : In our study primi constitutes 66% with a p value of <0.001 which is statistically significant,it correlates with the studies.

Socio economic Studies: Low socio economic status is reported to have higher incidence of hypertensives disorders of pregnancy .In our study also most of them belong to Class IV and V socio economic status.

Gestational Age : The average gestational age in our study is 35.1 weeks .About 68% cases developed Hypertension >34 weeks.

Correlatin between Dipstick analysis and 12/24 hours urine protein : In our there is poor correlation between urine dipstick and 12/24 hrs urine protein with p value of 0.001 which is statistically significant.

According to type of Hypertension : Among 100 patients ,34 GHTN,48 Pre eclampsia,4 Recurrent Pre Eclampsia,18 Severe Pre Eclampsia. In all types of Hypertensive disorders of pregnancy there is very good correlation between 12/24 hrs urine protein with p value 0.001,which is statistically significant.

Maternal Outcome : Maternal complications are Eclampsia, Abruption, DIC, HELLP Syndrome.These increase in rate of termination of pregnancy either by induction or Caeserean, leads to increase in preterm delivery.

Fetal Outcome : The common complications are LBW,IUGR,preterm birth, low APGAR score

Correlation between 12hrs and 24hrs Urine Protein : There is a significant correlation between 12hrs and 24hrs urine protein in all types of hypertension and in all degrees of proteinuria.The study shows a Pearsons Chi square value of 0.001 which is statistically significant.

CORRELATION COEFFICIENT :

The correlation coefficient r value comparing 12 and 24 hrs urine protein was 0.94 which is similar to other studies.

SUMMARY:

*The study is conducted in hospitalized patients above 20wks of gestation with hypertensive disorders of pregnancy.

*Since the level of urinary protein excretion has considerable clinical implications in the course of pregnancy and on the perinatal and neonatal outcome,the early detection of even minor degrees of proteinuria is important.

*For years 24hrs urine collection has been the gold standard for quantitation of proteinuria. But there are subjective errors. It requires good patient compliance and results in delay in the diagnosis.

* Proteinuria is proved to be an important predictor of maternal and fetal outcome.As the degree of proteinuria increases there is increase in neonatal and maternal morbitidy and mortality.

*This study shows that there is high degree of correlation between 12 and 24 hrs urine protein in all types of hypertension and all degrees of proteinuria.

*Our study showed that 12hr sample correlated with 24hrs sample for patients with no proteinuria(P< 0.001), mild proteinuria (P< 0.001) ,severe proteinuria(P <0.001) which is statistically significant.

*The correlation coefficient (r) between 12 and 24 hrs urine protein is 0.94 which is statistically significant.

*The statistical significance of the study comparing the accuracy of 12hrs urine protein with 24 hrs urine protein in predicting proteinuria with a sensitivity of 98.1% , sensitivity of 97.1%, positive predictive value of 94.1%,negative predictive 99%.

CONCLUSION:

Our study showed that there is a high correlation of 12hrs urine protein >165mg with a 24 hrs urine protein >300mg in all degrees of proteinuria and all types of hypertension.

The present study indicates that this method of quantification of proteinuria when properly interpreted can provide valuable information that for clinical purposes is a satisfactory substitute for the determination of protein excretion in a 24 hr collection.

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