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Research Paper

"Comparison of Protein/Creatinine Ratio in Single Voided Urine Sample with 24 Hours Urine Protein For Estimation of Proteinuria in Pregnancy Induced Hypertension"

Medical Science

KEYWORDS : : pregnancy induced hypertension, protein / creatinine (P: C) ratio, proteinuria, 24 hours urine.

Dr.Shabina khan	Assistant professor , Department of obstetrics and Gynecology,Rohilkand medical college and research Centre, Bareilly-243006. (Uttar Pradesh).
Dr.Shobha mukherjee	Associate professor, Department of obstetrics and Gynecology,Rohilkand medical college and research Centre, Bareilly-243006. (Uttar Pradesh).
Dr. H.K. Premi	Professor and HOD , Department of obstetrics and Gynecology,Rohilkand medical college and research Centre, Bareilly-243006. (Uttar Pradesh).
Dr.Shikha Dhawan	PG IInd Year, Department of obstetrics and Gynecology,Rohilkand medical college and research Centre, Bareilly-243006. (Uttar Pradesh).
Dr. Shreya Singh	PG IInd Year, Department of obstetrics and Gynecology,Rohilkand medical college and research Centre, Bareilly-243006. (Uttar Pradesh).

ABSTRACT

Objectives: To compare protein/creatinine ratio (P:C) a in single voided urine sample with 24 hours urine protein for estimation of proteinuria in pregnancy induced hypertension (PIH). Methods: A total of 50 pregnant women with pre eclampsia and gestational hypertension attending the teaching hospital attached to RMCH,Bareilly, was selected with following inclusion and exclusion criteria.

Inclusion Criteria.

Pregnant women with, pre eclampsia and gestational hypertension of blood pressure 140/90 mmHg or more recorded on two occasions at least 6 hours apart or single diastolic reading of >= 110 mmHg and the presence of proteinuria of > trace as detected by a qualitative test done on a random sample of urine.

Exclusion Criteria

Pre existing renal disease – A stable renal function was ascertained by doing a blood urea and serum creatinine. Urine analysis was done for all the patients to exclude the presence of microscopic haematuria, casts and bacteuria

Results: There was a significant correlation between 24 hours urine protein and P:C ratio. These also showed statistically significant linear relationship.

Conclusion: The spot urinary protein/creatinine ratio appears to be an excellent alternative to 24 hours urine protein. A level above 0.2 is a good indicator of significant proteinuria.

INTRODUCTION

Hypertensive disorder in pregnancy is a common disease. The incidence of pregnancy induced hypertension (PIH) in India range from 5-15%[1]. Proteniuria is essential for the diagnosis of pre eclampsia. Its presence is a sign of worsening hypertensive disease, specifically pre eclampsia. When proteniuria is overt and persistent, maternal and fetal morbidity are increased even more. As the proteinuria increases the likelihood of complications also increases and hence a rapid and accurate detection and quantitation of protenuria are essential for the management of hypertensive pregnant women.

The 24 hours urinary collection has been the standard in most places for quantifying proteinuria. Though reliable indicator, it has the disadvantages of being a cumbersome and time consuming process, for both the patient and laboratory; it is subjected to collection error; requires good patient compliance and there is a delay of 24 hours form the time of collection till the diagnosis is made[2].

METHOD

A study was carried on 50 randomly selected (booked and unbooked) admitted antenatal cases with hypertensive disorders in pregnancy with gestational age > 20 weeks.

24 hour urine collection was started before mid day. First sample was discarded and time was noted. 24 hour urine was collected in a clean bottle and last sample was taken on the next day at the same time. A single voided urine specimen for spot urinary P:C ratio was taken as soon as possible after the completion of 24 hour urine collection.

Urine proteins level was measured in both the samples with colorimetric method using pyrogallol red molybdate complex and urine creatinine level was determined by creatinine Jaffe method.

Urine proteins and creatinine were measured on Auto analyzer.

Results were subjected to statistical analysis. Correlation analysis was used to determine the relationship between 24 hours urine protein excretion and spot urine P:C.

INVESTIGATIONS

- Hb%
- Urine albumin, sugar, microscopy.
- 24 hours urine protein.
- Spot protein/creatinine ratio.
- Platelets
- Liver function tests
- Renal function tests

RESULTS

Table 1. DEMOGRAPHIC PROFILE (n=50).

Table 1.1 Age (Years) :

15-20	1	2%
21-25	20	40%
26-30	19	38%
31-35	10	20%

Table 1.2 :Status of antenatal care

Booked	20	40%
Unbooked	30	60%

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Table 1.3:Gravidity

Primigravida	22	44%
Multigravida	28	56%

Table 1.4 Period of gestation (weeks)

20-28weeks	7	14%
29-36 weeks	35	70%
>37 weeks	8	16%

Table 2: 24 HOURS URINE PROTEIN.

24 hours urinary protein (gm/day)	Number	Percentage(%)
Nil	4	8%
0-0.2	10	20%
0.21-3.5	30	60%
3.5-5.5	6	12%

Table 3. Spot sample protein / creatinine ratio (P:C).

P:C	Number	Percentage
Nil	9	18 %
0-0.2	10	20%
0.21-3.5	27	54%
>3.5	4	8%

DISSCUSION

24 hour urine collections are often used during pregnancy to quantify proteinuria. For years this has been the standard for the diagnosis and treatment of preeclampsia. However, 24-hour urine collections are cumbersome, subjective to collection error, require patient compliance, and result in a greater than 24 hour delay in diagnosis from the start of the collection 5. We found an excellent correlation between single voided urine P:C ratio and 24 hour urine protein excretion.Reliance on a voided urine P:C ratio decreases the need for patient compliance, minimizes collection and laboratory errors, and saves almost a day in ascertaining the results.

In our study, mean age was 26.9 years. Our study had found close correlation between P:C ratio and 24 hour urine protein and also showed statistically significant linear relationship between 24 hour urine protein and P:C ratio. Several studies showed excellent correlation between protein/creatinine ratio and 24 hour total protein in PIH. Bansal Bhavana et al, conducted study on 50 randomly selected antenatal cases with hypertensive disorders in pregnancy with gestational age >20 weeks. In their study they had found close correlation between P:C ratio and 24hrs urine protein and also showed statistically significant linear relationship between 24hrs urine protein and P:C ratio.

Adrienne B. et al, conducted study on 30 pregnant women with preeclampsia who were admitted to antepartum unit. They found there was a significant correlation between a 24hrs urine protein and P:C ratio. The association of maternal age and gestational age at collection with P:C ratio and 24hrs urine protein weak and not significant.

Diana Rodriguez-Thompson et al, studied 138 women who have undergone both a randomly urinary protein to creatinine ratio and 24hrs urine collection for the evaluation of pre-eclampsia. They found fifty percent of population had significant proteinuria. The data suggest that a cutoff below 0.14 ruled out significant proteinuria. The best cutoff $\geq$ 0.19 yields sensitivity of 90% and specificity of 70%. They concluded that the random urinary protein to creatinine ratio is strongly associated with 24hrs total protein excretion.

Magali Robert et al, conducted study on 71 samples collected from patients with gestational hypertension, preexisting hypertension and syndrome of haemolysis, elevated liver enzymes and platelets. They concluded that in non-ambulatory hypertensive pregnant patients there is a strong correlation between random voided protein creatinine ratio and 24hrs urine protein excretion.

Boler et al in their study of 54 pregnant women found the P/C ratio of a single urine specimen to be more practical accurate in assessing the renal function as compared to the 24 hour urine protein determination. Several studies showed excellent correlation between protein/creatinine ratio and 24 hour total protein in PIH. Robert M et al found close correlation between the two in 71 hypertensive pregnant women (r=0.94, p< 0.001)9. Durnwald found poor correlation between the 220 hypertensive pregnant women (r2 = 0.41)10.

Conclusion

The use of 24 hour urine collection for the management of proteinuria delays the diagnosis, is difficult and is sometimes unreliable because of incomplete collections. In pregnancy induced hypertension, measurement of the protein/creatinine ratio is a simple and inexpensive alternative to 24 hour urine protein estimate for quantitation of proteinuria.

REFERENCE

1. Bhosale L, Padia D, Malhotra H et al. Capsule "Sujat" | for comprehensive antenatal care and prevention of pregnancy induced hypertension. Bombay Hosp J 2000;42:136-40. | 2. Neithardt AB, Dooley SL, Borensztajn J. Prediction of | 24 hour protein excretion in pregnancy with a single voided urine protein to creatinine ratio. Am J Obstet Gynecol 2002;186:883-6. | 3. Young RA, Buchanan RJ, Kinch RA. Use of the protein | creatinine ratio of a single voided urine specimen in the | evaluation of suspected pregnancy – induced hypertension. J Fam Pract 1996;42:385-9. | 4. Bansal Bhavana, Midha Usha, Goyal Sunita, Bajwa Navjot, Comparision of protein/creatinine ratio in single voided urine sample with 24 hours urine protein for estimation of proteinuria in pregnancy induced hypertension. J Obs Gyn India 2009; 59: 424-426. | 5.Adrienne B. Neithardt, MD, Sharon L. Dooley, Prediction of 24 hours protein excretion in pregnancy with a single voided urine protein-to-creatinine ratio. Am J Obstet Gynecol 2002; 186: 883-886. | 6.Diana Rodriguez-Thompson, MD, MPH, and Ellice S. Lieberman, MD, DrPH. Use of random urinary protein-to-creatinine ratio for the diagnosis of significant proteinuria during pregnancy Am J Obstet Gynecol 2001; 185: 808-811. | 7. Maglai Robert, MD, Farshad Sepandj, MD, Robert M. Liston, MD. Random protein creatinine ratio for the quantitation of proteinuria in pregnancy. Obstet Gynecol 1997; 90: 893-5. | 8. Leo Boler, Edward A Zbella, Norbert Gleicher, Quantitation of Proteinuria in pregnancy by the use of single voided urine samples, Obstet Gynecol, 1987; 70:99-101. | 9. Rodriguez–Thompson D, Lieberman ES. Use of a random urinary protein to creatinine ratio for the diagnosis of significant proteinuria during pregnancy. Am J Obstet Gynecol 2001;185:808-11. | 10. Durnwald C, Mercer B. A Prospective comparison of total protein/creatinine ratio versus 24 hour urine protein in women with suspected preeclampsia. Am J Obstet Gynecol 2003;189:848-52.