ORIGINAL RESEARCH

Comparison of single spot urinary albumin-creatinine ratio with 24-hour urinary protein excretion in women with preeclampsia

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ABSTRACT

Background: Preeclampsia is a pregnancy-specific disorder that affects both the mother and the fetus, characterized by hypertension and proteinuria after 20 weeks of gestation.The aim of this study is to investigate the correlation between single spot urinary ACR and 24-hour urinary protein excretion in women with preeclampsia. **Methods:** The current prospective study was conducted on pregnant women who were diagnosed with preeclampsia and were attending the Outpatient department or admitted in the Department of Obstetrics and Gynaecology at SMGS Hospital, Government Medical College, Jammu. A total of 100 patients as per inclusion criteria of the study were included in the study after an approval was obtained from the Institute Ethics Committee. **Results:** The study conducted on a sample of 100 pregnant women revealed that the prevalence of preeclampsia was high, with 87% of the participants having mild preeclampsia and 13% having severe preeclampsia. Furthermore, a majority of the patients exhibited normal serum creatinine levels (94%) and elevated serum urea levels (95%), and urine for albumin level was 1+ in 81% of the cases. Additionally, the study found that patients with severe preeclampsia had significantly higher mean levels of albumin, 24-hour protein excretion, and spot urinary albumin creatinine ratio than those with mild preeclampsia. Lastly, the study demonstrated a positive linear relationship between ACR and 24-hour urinary protein excretion. **Conclusion:** Majority were young, primigravida, and had no history of abortion or issues. Patients with severe preeclampsia had higher blood pressure and significantly higher levels of albumin, 24-hour protein excretion, and spot urinary albumin creatinine ratio. There was a strong linear correlation between ACR and 24-hour urinary protein excretion. These findings can aid healthcare providers in identifying high-risk patients and tailoring treatment plans to improve outcomes.

Keywords: 24-hoururinaryproteinexcretion, albumin-creatinineratio, preeclampsia

INTRODUCTION

Preeclampsia is a pregnancy-specific disorder that affects both the mother and the fetus, characterized by hypertension and proteinuria after 20 weeks of gestation. The exact cause of preeclampsia remains unknown, but it is believed to be associated with abnormal placentation leading to placental hypoxia. Mild preeclampsia affects around 15% of pregnancies, while severe cases occur in 1-2% of pregnancies. Preeclampsia is a serious complication in developing countries, affecting approximately 10% of pregnancies and accounting for around 76,000 maternal deaths each year.[1,2] The accurate and timely diagnosis of preeclampsia is critical for the appropriate management of this condition. One commonly used test for detecting proteinuria is the measurement of urinary protein excretion over a 24-hour period. However, this method is cumbersome and time-consuming for both patients and healthcare providers.[3] The dipstick analysis, which employs visual reagent strips, is a convenient and portable method for assessing proteinuria, but its high false positive and false negative rates are well documented.[4] To address this issue, single spot urinary albumin:creatinine ratio (ACR) has been proposed as a more accurate measure of protein excretion, as it avoids the influence of variations in urinary solute concentration and provides a rapid and

convenient method of assessment. This approach has been endorsed by several international organizations as a reliable means of identifying significant proteinuria (>0.3g/24h) in pregnant women.[5-7] Therefore, the use of single spot urinary albumin:creatinine ratio (ACR) has gained popularity as a simpler and more convenient method for detecting proteinuria in women with preeclampsia. The aim of this study is to investigate the correlation between single spot urinary ACR and 24-hour urinary protein excretion in women with preeclampsia. This correlation will be useful in determining whether single spot urinary ACR can accurately predict 24-hour urinary protein excretion, which would enable clinicians to more easily and efficiently diagnose and monitor proteinuria in women with preeclampsia. The findings of this study could have significant implications for the management and treatment of preeclampsia, ultimately improving maternal and fetal outcomes.

METHODS

The current prospective study was conducted on pregnant women who were diagnosed with preeclampsia and were attending the Outpatient department or admitted in the Department of Obstetrics and Gynaecology at SMGS Hospital, Government Medical College, Jammu. The study was carried out for a period of one year, from October 2014 to September 2015. Prior approval was obtained from the Institute Ethics Committee, and only patients who provided written informed consent were recruited for the study.

The inclusion criteria for the study were pregnant women between the ages of 18 and 40 years, with over 20 weeks of gestation, attending the outpatient department, as well as those who were admitted to the hospital. These patients were required to have a blood pressure reading of over 140/90 mm Hg on at least two readings taken six hours apart and have previously been normotensive before 20 weeks of gestation. Additionally, they were required to have albuminuria of more than 1+ on dipstick. The exclusion criteria were as follows: patients with a history of blood pressure readings over 140/90 mmHg before 20 weeks of gestation, pregnant women with known kidney disease, those with connective tissue disorders, preexisting diabetes or gestational diabetes, bacteriuria, those who had undertaken excessive exercise, defined as more than one hour of vigorous exercise on the day of urine collection, those who had taken bed rest of more than 24 hours, and those who delivered before the 24-hour urinary collection was completed.

The potential participants for the study were pregnant patients admitted to the hospital who fulfilled the inclusion criteria. Pregnant patients attending the outpatient department on one day in a week were requested to participate in the study if they fulfilled the inclusion criteria. A total of 100 patients were included in the study, and the particulars of the patients were noted according to the prescribed proforma. The patients included in the study were subjected to detailed history and clinical examination, including general physical, obstetrical, and systemic examination. Particular enquiry was made regarding history of increased blood pressure, pedal edema, and blurring of vision. All the investigations, including haemoglobin, bleeding time, clotting time, routine urine examination, prothrombin time, PTI, platelet count, renal function test, liver function test, and urine for albumin, urine for creatinine, 24-hour urinary protein excretion, and spot urinary albumin:creatinine ratios were noted down. The blood pressure was recorded in a uniform manner using a standard sphygmomanometer with the fourth Korotkoff sound determining the diastolic blood pressure. A spot midstream urine sample was taken for the detection of albuminuria by the dipstick method. Patients with more than 1+ albuminuria were taken for the study. Following this, another spot sample was taken for the detection and calculation of spot urinary albumin-creatinine ratio. The 24-hour urine collection began immediately afterwards to evaluate 24-hour urinary protein excretion. Only one 24-hour urine collection per woman was included in the analysis. The albumin concentration in the urine and 24-hour urinary protein excretion was determined by the Turbidimetric Method, while creatinine concentration was measured with the Jaffe's Method. For Jaffe's Method, reagents used were lithium picrate, sodium hydroxide, and potassium ferricyanide.

The procedure for detecting 24-hour urinary protein involves several methods. To measure protein concentration via the turbidimetric method, a reagent consisting of 3% sulphosalicylic acid and albumin standard is utilized. A 0.5 ml urine sample is mixed with 3.5 ml of reagent and left for 10 minutes. Afterward, the solution is read at 620 nanometers (red filter) against a blank solution. By obtaining optical densities and referencing a graph prepared using different concentrations of albumin standards and their respective optical densities, the concentration of 24-hour urinary protein in the sample is calculated. Spot urinary albumin concentration is calculated using a different method. A reagent consisting of 25% sulphosalicyclic acid is utilized, and 5 ml of urine is mixed with 0.5 ml of the reagent. The protein present in the solution appears as a white precipitate. After 10 minutes, the optical density is measured, and the concentration of albumin in the sample is calculated using a graph prepared from different albumin standards and their corresponding optical densities. The concentration of spot urinary creatinine is determined via Jaffe's method, which is modified by Larsen. The method involves the use of a kinetic Jaffe's method, modified by Larsen and estimated on a fully automatic biochemistry autoanalyzer, Dimension RXL Max. The reagents used include lithium picrate, sodium hydroxide, and potassium

ferricyanide. The process involves the formation of a red chromophore resulting from the reaction between creatinine and picrate. The chromophore absorbs at 510 nanometers.

Statistical analysis of the data is conducted using Microsoft Excel and SPSS (Statistical Package for the Social Science) Version 17.0 for Windows. Results are presented as a percentage and mean ± standard deviation, and analyzed using the Chi-square test and student t test. A P-value of less than 0.05 is considered statistically significant.

RESULTS

There were a total of 100 patients included in the study. The majority of the patients fell within the age range of 26 to 30 years, comprising 47% of the total patients. The second most common age group was 21 to 25 years, accounting for 35% of the patients. Patients below 20 years old made up only 4% of the total patients, while those aged 31 to 35 years comprised 13%. Only one patient, which is 1% of the total, was above 36 years old. The majority of patients (61%) had a weight in the range of 61-70 kg, while 29% of patients had a weight in the range of 71-80 kg. Only 6% of patients had a weight less than 60 kg, and 4% of patients had a weight greater than 81 kg. Most of the patients (69%) were primigravida, meaning they were pregnant for the first time. 18% had three previous pregnancies, 6% had four previous pregnancies, and 7% had more than five previous pregnancies. The majority of patients (72%) were nulliparous, meaning they had no previous pregnancies. 11% of patients had Para 1 and Para 2 each, while only a small percentage had Para 3, Para 4, or Para 5 (2% each). Out of 100 patients, 82 have had no abortions, 11 have had one abortion, 3 have had two abortions, 3 have had three abortions, and 1 patient has had five abortions. About 73 (73%) patients had no live issues, 12 (12%) had one live issue, 11 (11%) had two live issues, 2 (2%) had three live issues, 1 (1%) had four live issues, and 1 (1%) had five live issues. The majority of patients, 40%, had SBP readings in the range of 140-149 mmHg, followed by 36% of patients with SBP readings in the range of 150-159 mmHg. The percentages of patients in the ranges of 160-169 mmHg, 170-179 mmHg, and >180 mmHg were 15%, 5%, and 4%, respectively. There were a total of 100 patients included in the study. The majority of patients (51%) had a DBP reading between 90-99 mmHg, while 35% had a reading between 100-109 mmHg. 12% of patients had a DBP reading between 110-119 mmHg, and only 2% had a reading >120 mmHg.

Table 1: Distribution of patients according to severity of preeclampsia

SBP/DBP (mmHg)	No. of patients	Percentage (%)
≥140/≥90 (mild preeclampsia)	87	87.00
≥160/≥110 (severe preeclampsia)	13	13.00
Total	**100**	**100.00**

Out of 100 patients, 87 (87%) had readings of >140/>90 mmHg, which indicates mild preeclampsia. The remaining 13 (13%) had readings of >160/>110 mmHg, indicating severe preeclampsia.

Table 2: Distribution of patients according to serum urea levels

Serum urea levels (mg/dL)	No. of patients	Percentage (%)
<11	5	5.00
≥11	95	95.00
Total	**100**	**100.00**

Out of 100 patients, only 5 patients (5.00%) had serum urea levels below 11 mg/dL, while the remaining 95 patients (95.00%) had levels above 11 mg/dL. The mean serum urea ± standard deviation (range) = 20.18 ± 3.31 (10 – 28) mg/dL.

Table 3: Distribution of patients according to serum creatinine levels

Serum creatinine levels (mg/dL)	No. of patients	Percentage (%)
<0.9	94	94.00
≥0.9	6	6.00
Total	100	100.00

Out of the 100 patients, 94 (94%) had serum creatinine levels less than 0.9 mg/dL, and 6 (6%) had levels greater than 0.9 mg/dL. The mean serum creatinine ± standard deviation (range) = 0.66 ± 0.13 (0.4 – 0.9) mg/dL.

Table 4: Distribution of patients according to urine for albumin

Urine for albumin levels	No. of patients	Percentage (%)
1+	81	81.00
2+	12	12.00

3+	7	7.00
Total	100	100.00

The patients were categorized into three groups, based on the amount of albumin detected in their urine sample: 1+, 2+, and 3+. Out of 100 patients, 81 (81%) had 1+ albumin in their urine, 12 (12%) had 2+, and 7 (7%) had 3+.

Table 5: Comparison of mean spot urinary albumin (mg/dL) levels between patients with mild and severe preeclampsia

Preeclampsia	Mean ± standard deviation (mg/dL)	Statistical inference (Student's t-test)
Mild preeclampsia (n=87)	192.05 ± 120.75	t=13.64; p=0.0001; Highly significant
Severe preeclampsia (n=13)	759.4 ± 235.09	

The table shows that patients with mild preeclampsia (n=87) have a mean spot urinary albumin level of 192.05 ± 120.75 mg/dL, while patients with severe preeclampsia (n=13) have a higher mean level of 759.4 ± 235.09 mg/dL. The statistical inference using Student's t-test shows a significant difference between the two groups, with a t-value of 13.64 and a p-value of 0.0001, indicating a highly significant difference.

Table 6: Comparison of mean spot urinary creatinine (mmol/L) levels between patients with mild and severe preeclampsia

Preeclampsia	Mean ± standard deviation (mg/dL)	Statistical inference (Student's t-test)
Mild preeclampsia (n=87)	5.27 ± 1.14	t=0.09; p=0.92; Not significant
Severe preeclampsia (n=13)	5.30 ± 0.96	

The results indicate that the mean spot urinary creatinine levels were not significantly different between patients with mild and severe preeclampsia (t=0.09; p=0.92; not significant). The mean spot urinary creatinine levels in patients with mild preeclampsia was 5.27 ± 1.14 mgdl/L, while in patients with severe preeclampsia, it was 5.30 ± 0.96 mgdl/L.

Table 7: Comparison of mean 24-hour urinary protein excretion (g/L) levels between patients with mild and severe preeclampsia

Preeclampsia	Mean ± standard deviation (g/L)	Statistical inference
Mild preeclampsia (n=87)	0.40 ± 0.22	t=13.64; p=0.0001; Highly significant
Severe preeclampsia (n=13)	3.36 ± 2.00	

The results show that patients with severe preeclampsia have a significantly higher mean 24-hour urinary protein excretion level (3.36 ± 2.00 g/L) compared to patients with mild preeclampsia (0.40 ± 0.22 g/L). The Student's t-test indicates a highly significant difference between the two groups (t=13.64; p=0.0001). This suggests that 24-hour urinary protein excretion levels can be used as a marker for assessing the severity of preeclampsia.

Table 8: Comparison of mean spot urinary albumin creatinine ratio (mg/mmol) between patients with mild and severe preeclampsia

Preeclampsia	Mean ± standard deviation (mg/mmol)	Statistical inference (Student's t-test)
Mild preeclampsia (n=87)	36.35 ± 21.34	t=15.21; p=0.0001; Highly significant
Severe preeclampsia (n=13)	140.56 ± 32.72	

The mean spot urinary albumin creatinine ratio (mg/mmol) was significantly higher in patients with severe preeclampsia (140.56 ± 32.72) compared to those with mild preeclampsia (36.35 ± 21.34), with a t-value of 15.21 and a p-value of 0.0001.

DISCUSSION

In the presents study, we observed evaluated the performance of single spot urinary albumin-creatinine ratio (ACR) and 24-hour urinary protein excretion in women with preeclampsia. In our study, the majority of the 100 female patients were in the age group of 26-30 years (47%), followed by the age group of 21-35 years (35%), and 31-35 years (13%). The age group of <20 years had the least number of patients (4%), while only 1% of patients were in the age group of >36 years. The mean age of the patients was 26.71 ± 3.89 (range 19.5-37) years, indicating that most of

the females were in the age group of 26-35 years (60%). Interestingly, our study findings are in line with several other studies in the field. Kieler et al. (2003), Leanos-Miranda et al. (2007), and Eslamian et al. (2011) all reported similar results regarding the mean age of patients.[8-10]

Our study revealed that the majority of patients had a weight in the range of 61 to 70 kg (61%), followed by 71 to 80 kg (29%). Only 6% of patients had a weight below 60 kg, while 4% had a weight greater than 81 kg. The mean weight ± standard deviation (range) was found to be 70.12 ± 6.18 (58 – 92) kgs. Regarding the gravidity status, our study found that out of a hundred patients, most were primigravida (69%), followed by gravida 3 (18%) and gravida 4 (6%). Only 7 patients had conceived five or more times, making primigravida the predominant category. The risk of developing pre-eclampsia is higher in primigravida, as highlighted in previous studies.[11,12] Our study also found that the majority of patients were nullipara (72%), followed by para 1 and para 2 (11% each), and para 3, para 4, and para 5 (2% each). Most patients had no history of abortion (82%), followed by one abortion (11%), two and three abortions (3% each). One patient had experienced five abortions, as presented in Table 5. Moreover, most patients had no live issues (73%), followed by one live issue (12%), two live issues (11%), three live issues (2%), four and five live issues (1% each). These findings are consistent with the study by Kieler H et al. (2003), which found that 76.6% of patients were nullipara, while 23.3% were multipara.[13]Rangasamy S et al. (2012) reported that 52% were nullipara, and 48% were multipara.[14]

In terms of systolic blood pressure (BP), our study found that all patients had a systolic BP in the range of 140-182 mm of Hg, with the majority in the range of 140-159 mm of Hg (76%). The mean systolic BP was found to be 151.78 ± 11.07 mmHg, while the remaining patients had systolic BP ranging from 160 mmHg or more (24%). These results are consistent with studies by Kieler H et al. (2003) and Rangasamy S et al. (2012), which reported mean systolic BP of 153 mmHg and 154 mmHg, respectively.[13,14] Similarly, our study found that the diastolic BP was in the range of 90-122mm of Hg, with the majority in the range of 90-109mm of Hg (86%). The diastolic blood pressure (BP) of participants fell within the range of 90-122mm of Hg, with the majority (86%) in the range of 90-109mm of Hg. The mean diastolic BP was found to be 98.46 ± 8.16mm of Hg, while the remaining participants had a diastolic BP of 110mm of Hg or more (14%). These findings were consistent with previous studies by Kieler et al. (2003) and Rangasamy S et al. (2012), which reported mean diastolic BP of 94mm of Hg and 107mm of Hg, respectively.[13,14] Our study revealed a mean ± standard deviation (range) of systolic BP of 151.78 ± 11.07 (140 – 182) mm of Hg, and a mean age ± standard deviation (range) of diastolic BP of 98.46 ± 8.16 (90 – 122) mmHg. These results were in line with the study conducted by Olooto et al. (2013), which reported a mean ± standard deviation of systolic and diastolic BP of 160 ± 11.1 mm of Hg and 104 ± 5.27 mm of Hg, respectively.[15]

The present study found that 87% of the patients had mild preeclampsia (SBP/DBP >140/>90 mmHg), while 13% had severe preeclampsia (SBP/DBP >160/>110 mmHg). These findings were not consistent with the study conducted by Sogani et al. (2014), where the preeclamptic group was further divided into two subgroups: mild (n = 25; 69.4%) and severe preeclampsia (n = 11; 30.55%).[16] Most of the study participants (95%) had serum urea levels greater than 11 mg/dL, while the remaining (5%) had levels below 11 mg/dL. The mean serum urea ± standard deviation (range) was found to be 20.18 ± 3.31 (10 – 28) mg/dL. Few studies are available on this topic. Huang et al. (2012) reported that the mean ± standard deviation of urea nitrogen levels in patients with mild preeclampsia was 3.6 ± 1.6 mmol/L, compared to those with severe preeclampsia, which was 6.2 ± 4.1 mmol/L. These findings were not similar to our study.[17]

In our study, the majority of the patients (94%) exhibited serum creatinine levels below 0.9 mg/dL, while a small number of patients (6%) had levels exceeding 0.9 mg/dL. The mean serum creatinine ± standard deviation (range) was 0.66 ± 0.13 (0.4 – 0.9) mg/dL. Our study findings correspond with the results of Leanos-Miranda et al. (2007), which indicated a mean ± standard deviation of serum creatinine of 0.69 ± 0.16 mg/dL.[18] The research conducted by Lamontagne et al. (2014) also showed a mean ± standard deviation of serum creatinine of 58.9 ± 10.0 µmmo/L, which is consistent with our study.[19]

Regarding urine for albumin levels, most patients in our study showed a 1+ level (81%), while 12% showed a 2+ level, and 7% exhibited a 3+ level. The mean ± standard deviation of spot urinary albumin level in 13 patients with severe preeclampsia was significantly higher (759.4 ± 235.09 mg/dL) compared to that of 87 patients with mild preeclampsia (192.05 ± 120.75 mg/dL), as indicated in Table 14. The mean ± standard deviation (range) value of spot urinary albumin level was 267.67 ± 237.39 mg/dL(81-1090). The difference between the two means was statistically significant (p=0.0001). In contrast, Moiety et al. (2014) found a mean ± standard deviation of spot urinary albumin level in 50 patients with severe preeclampsia to be 3976.97 ± 5580.22 mg/L, which was much higher than that found in 50 patients with mild preeclampsia (717.99 ± 1273.03 mg/L, p=0.001) and inconsistent with our study.[20]

Our study findings reveal that the mean spot urinary creatinine level in severe preeclampsia patients was not significantly different from that of mild preeclampsia patients (5.30 ± 0.96 vs 5.27 ± 1.14 mmol/dL), with a p-value of 0.92. The mean spot urinary creatinine value for all patients was 5.29 ±

1.11 mmol/dL. These results are consistent with Huang et al. (2012), where the mean spot urinary creatinine levels in mild and severe preeclampsia patients were 51.8 ± 8.97 mmol/L and 77.7 ± 59.4 mmol/L, respectively.[17] However, our findings differ from those of Moiety et al. (2014), where the mean ± standard deviation of spot urinary creatinine levels in mild preeclampsia patients was 5.53 ± 4.76 mmol/L compared to that in severe preeclampsia patients, which was 8.24 ± 7.86 mmol/L with p=0.058. Additionally, in our study, severe preeclampsia patients had a higher mean 24-hour urinary protein excretion level compared to mild preeclampsia patients (3.36 vs 0.40 g/L), with a highly significant p-value of 0.0001. The mean ± standard deviation 24-hour urinary protein secretion (g/L) level between patients with mild and severe preeclampsia was 0.40 ± 0.22 and 3.36 ± 2.00, respectively. Our findings align with Gao et al. (2012), where the 24-hour urinary protein excretion levels in mild and severe preeclampsia were 700 ± 160 mg and 4800 ± 2200 mg, respectively, with a p-value of <0.05.[21] Furthermore, the mean protein excretion reported by Aggarwal et al. (2008) was 1.33 g/L (range, 0.1–7.6), which is consistent with our study. Our findings differ from those of Kieler H et al. (2003) and Rangasamy S et al. (2012).[13,14]Kieler H et al. reported a mean 24-hour urinary albumin excretion of 3.0 g/L (±SD 2.0 g/L), which is considerably higher than the levels observed in our study. In contrast, Rangasamy S et al. found a mean 24-hour urinary albumin excretion of 95.72 mg/L (± SD 73.64 mg/L), which is notably lower than the levels we observed in our study.

The present study revealed that the mean spot urinary albumin creatinine ratio (ACR) in severe preeclampsia patients was significantly higher than that in mild preeclampsia patients (140.56 vs 36.35 mg/mmol), with a statistically significant difference (p=0.0001). The mean value of spot urinary ACR in all patients was (50.22 ± 42.11) mg/mmol. The mean spot urinary ACR (mg/mmol) between patients with mild and severe preeclampsia was 36.35 ± 21.34 and 140.56 ± 32.72, respectively. Our findings do not match with Huang et al. (2012), as their study reported a mean spot urinary ACR of 72.68 ± 12.4 mg/mmol for mild preeclampsia and 401.2 ± 345.1 mg/mmol for severe preeclampsia patients (p<0.05).[17] Similarly, Moiety et al. (2014) observed mean spot urinary ACR levels of 140.36 ± 232.59 mg/mmol in mild preeclampsia patients (n=50) and 631.62 ± 530.60 mg/mmol in severe preeclampsia patients (n=50), which is not consistent with our findings.[20] This could be due to the higher proportion of severe preeclampsia patients in their sample.

A positive linear relationship between ACR and 24-hour urinary protein excretion, was established with a Pearson Correlation Coefficient of 0.836, indicating a strong predictor. The coefficient of determination(R2) was 0.70, which implies that 70% of the variation in one variable can be explained by the other. The regression equation can be expressed as y = a+bx or -.484 + .26x, where y represents the dependent variable (24-hour urinary protein excretion), a is the intercept or change in y when x=0, and b is the regression coefficient or change in unit y given change per unit x. Our study demonstrated a high level of consistency with previous research, including Ray et al. (2015), with a Pearson correlation coefficient of 0.94 and p<0.0001. Our findings also align with studies conducted by Sogani et al. (2014), Huang et al. (2012),Leanos-Miranda et al. (2007), Lamontagne et al. (2014), Risberg et al. (2004), Heerspink et al. (2006), and Yin and Zhong (2015) which reported a strong correlation between ACR and 24-hour urinary protein excretion.[16-19, 23-25] However, our study did not support the findings of Nischintha et al. (2014), which found only a moderate correlation between 24-hour urine protein and spot urine P/C ratio. Similarly, Wikstrom et al. (2006) found that random urine albumin:creatinine ratio was not stable throughout the day and therefore not a reliable predictor of 24-hour proteinuria, which is not consistent with our study.

CONCLUSION

The present study provides valuable insights into the demographic and clinical characteristics of pregnant women with preeclampsia. The majority of patients were in the age group of 21 to 30 years, had a weight between 61 to 80 kgs, were primigravida, and had no history of abortion or issues. The mean systolic and diastolic blood pressures were higher in patients with severe preeclampsia than in those with mild preeclampsia. The analysis showed significantly higher levels of mean albumin levels, mean 24-hour protein excretion levels and mean spot urinary albumin creatinine ratio in patients with severe preeclampsia. Furthermore, a positive linear correlation was observed between ACR and 24-hour urinary protein excretion, with a very strong correlation and a high coefficient of determination. Overall, these findings could help healthcare providers identify high-risk patients and tailor their treatment plans accordingly to improve maternal and fetal outcomes.

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