RESULTS

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This study included three hundred nulliparous pregnant women at the time of registration in Benha University Hospital. They were classified into:

- Group (A): Represents patients who develop preeclampsia (n= 40).
- Group (B): Represents patients who developed transient hypertension (n= 10).
- Group (C): Represents the normotensive pregnant women (n= 250).

Table (1) and table (2) represent comparative study for different demographic data analysis of patients.

Table (1) represents comparison between group (A) and group (C) in the clinical characteristics of preeclamptic group and normotensive group.

- There were non-significant difference of age for the two groups ($P > 0.05$).
- There was significant higher blood pressure (either systolic or diastolic) for group (A) than (C) ($P < 0.0001$).
- There was significantly lower gestational age for group (A) than group (C) ($P < 0.001$).

- A statistical comparison between infant birth weight of group (A) and that of group (C) revealed that there was significantly lower birth weight of infants of group (A) than group (C) ($P < 0.001$).

In table (2):

- There were non-significant difference of age for the two groups (B) and (C) ($P > 0.05$).
- There was significant higher blood pressure (either systolic or diastolic) for group (B) than (C) ($P < 0.001$).
- There was significantly lower gestational age for group (B) than group (C) ($P < 0.001$).
- A statistical comparison between infant birth weight of group (B) and that of group (C) revealed that there was significantly lower birth weight of infant of group (B) than group (C) ($P < 0.001$).

Table (1): Summary of different clinical feature of studied groups (mean ± SD).

Studied Groups / Variables	Group (A) n= 40	Group (C) n= 250	t	P
Maternal age (years) Mean ± SD	29.47±3.78	26.9±3.96	1.47	>0.05
Systolic blood pressure (mmHg) Mean ± SD	161.67±15.28	115.0±19.27	11.77	<0.0001
Diastolic blood pressure (mmHg) Mean ± SD	102.08±10.76	78.75±14.08	9.78	<0.0001
Gestational age at termination (weeks) Mean ± SD	36.07±1.16	39.15±0.67	4.82	<0.001
Infant birth weight (gm) Mean ± SD	2308.33±514.75	3201.25±197.26	7.12	<0.001

Table (2): Summary of the different clinical feature of studied groups (mean ± SD).

Studied Groups / Variables	Group (B) n= 10	Group (C) n= 250	t	P
Maternal age (years) Mean ± SD	27.6±3.44	26.9±3.96	0.98	>0.05
Systolic blood pressure (mmHg) Mean ± SD	150.0±8.16	115.0±19.27	9.50	<0.001
Diastolic blood pressure (mmHg) Mean ± SD	97.50±8.66	78.75±14.08	7.33	<0.001
Gestational age at termination (weeks) Mean ± SD	37.00±1.58	39.15±0.67	3.82	<0.001
Infant birth weight (gm) Mean ± SD	2805.32±44.75	3201.25±197.26	5.29	<0.001

During the follow up of the maternal body weight for the studied groups it was found that there were significant higher increase in group (A) than group (C) ($P < 0.05$) (Table 3) and in comparison there were non-significant increase in group (B) than group (C) ($P > 0.05$) (Table 4) .

Table(3) :The mean maternal body weight of the studied groups during the periods of follow up (mean ± SD) .

Gestational age (weeks)	Group (A) n = 40	Group (C) n = 250	t	P
20 - 24 (mean ± SD)	73.60±8.32	62.90±8.45	4.029	< 0.05
24 - 28 (mean ± SD)	75.60±8.58	63.72±6.68	2.88	< 0.05
28 - 34 (mean ± SD)	76.13±13.2	65.70±9.27	7.98	< 0.001

Table(4) :The mean maternal body weight of the studied groups during the periods of follow up (mean ± SD) .

Gestational age (weeks)	Group (B) n = 10	Group (C) n = 250	t	P
20 - 24 (mean ± SD)	68.60 ±7.70	62.90±8.45	2.37	< 0.05
24 - 28 (mean ± SD)	69.60 ±7.80	63.72±6.68	3.35	< 0.05
28 - 34 (mean ± SD)	70.50 ±0.50	65.70±9.27	3.27	< 0.05

A comparison between urine microalbumin of the studied groupd reveals that were significant increase in urine microalbumin in group (A) during the period of follow up than group (C) (Table 5) and non-significant increase in urine microalbumin ($P > 0.05$), in group (B) in comparison with group (C) (Table 6) .

Table(5) :The mean urine microalbumin for the studied groups during the periods of follow up (mean ± SD) .

Gestational age (weeks)	Group (A) n = 40	Group (C) n = 250	t	P
20 - 24 (mean ± SD)	10.0 ± 0.5	5.0 ± 0.5	0.01	< 0.05
24 - 28 (mean ± SD)	20.0 ± 0.5	5.0 ± 0.5	5.50	< 0.05
28 - 34 (mean ± SD)	50.0 ± 0.25	10.0 ± 0.5	10.50	< 0.001

Table(6) : The mean urine microalbumin for the studied groups during the periods of follow up (mean ± SD) .

Gestational age (weeks)	Group (B) n = 10	Group (C) n = 250	t	P
20 - 24 (mean ± SD)	5.0 ± 0.5	5.0 ± 0.5	1.55	> 0.05
24 - 28 (mean ± SD)	5.0 ± 0.5	5.0 ± 0.5	1.55	> 0.05
28 - 34 (mean ± SD)	10.0 ± 0.1	10.0 ± 0.5	5.55	> 0.05

A comparison between patients "PIH" (n= 50) and normotensive group (n= 250) for urine calcium/urine creatinine ratio revealed that there was significant lower ratio for patient groups (50) than normotensive group (250) as shown in table (7) during the periods of follow up.

Table (7): The mean urine calcium/urine creatinine ratio for studied groups during periods of follow up (,) (mean±SD).

Gestational age (weeks)	PIH n= 50	Normotensive n= 250	t	P
20 – 24 (mean ± SD)	0.17±0.07	0.32±0.04	8.34	< 0.001
24 – 28 (mean ± SD)	0.13±0.11	0.25±0.08	9.98	< 0.001
28 – 34 (mean ± SD)	0.07±0.08	0.23±0.06	12.78	< 0.001

A correlation (r) of urine microalbumin and gestation age revealed that significant positive correlation ($P < 0.05$) (Table 8).

A correlation (r) of urine microalbumin and systolic and diastolic blood pressure revealed that significant positive correlation with systolic and diastolic blood pressure ($P < 0.05$) (Table 8).

A correlation of urine calcium/urine creatinine ratio with systolic and diastolic blood pressure revealed that there was significant negative correlation ($P < 0.05$) (Table 8).

A correlation of urine calcium urine/creatinine ratio with gestation age revealed that there was significant negative correlation ($P < 0.05$) (Table 8).

Table (8): Correlation (r) of urine microalbumin and urine calcium/urine creatinine ratio in relation to blood pressure (systolic and diastolic) and gestational age for all studied samples (300).

Studied Variables	Urine Microalbumin		Urine calcium/urine creatinine ratio	
	r	P	r	P
Systolic Bl.P. (mmHg)	0.80608	< 0.05	0.66745	< 0.05
Diastolic Bl.P. (mmHg)	0.7783	< 0.05	0.71630	< 0.05
Gestational age (weeks)	0.56266	< 0.05	0.61262	< 0.05

Table (9): Relationship of microalbuminuria and development of pregnancy induced hypertension (PIH).

Microalbuminuria	PIH present		PIH absent	
	n	(%)	n	(%)
Present (n= 70)	40	(60)	30	(40)
Absent (n= 230)	10	(4.2)	220	(95.8)

Table (9) represents the results of the Micral test for the study group, the test was considered positive when the level of albumin in the urine ≥ 20 μg/ml. The number of patients positive for microalbuminuria (n= 70) of these 40 cases develop PIH whereas only 10 cases of microalbuminuria negative patients develop PIH.

Table (10): For different parameter of the Mioral test.

Microalbuminuria	Value
Sensitivity of the test was	68.42%
Specificity of the test was	91.84%
Positive predictive value was	60%
Negative predictive value was	95.80%

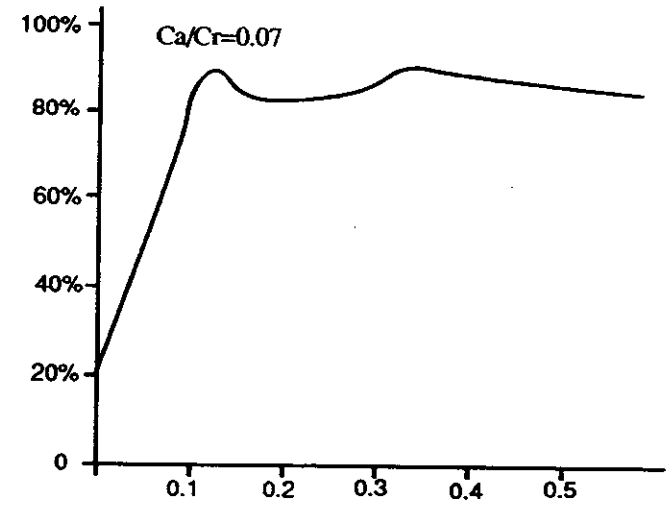

Fig. (1): Threshold value chosen as a predictor for pre-eclampsia set at 0.07 (

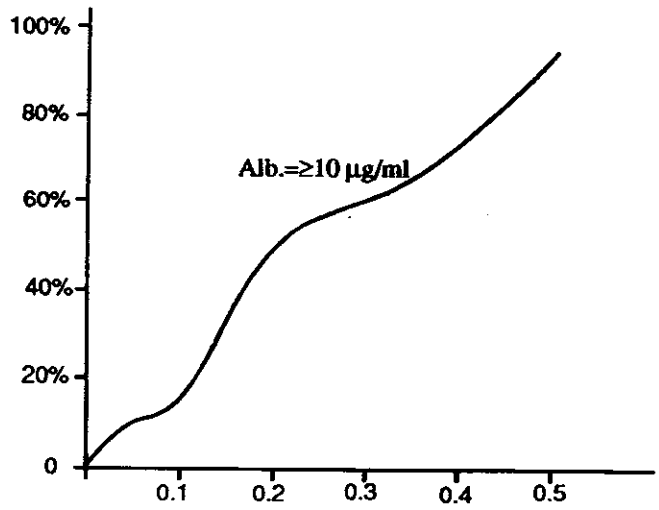

Fig. (2): Threshold value set at ≥10 µg/ml

The two curves represent the threshold level at which set up the development of preeclampsia in the study group.

A urine calcium/urine creatinine ratio threshold value of 0.07 was chosen a predictive for the development of preeclampsia (Fig. 1).

Twenty four of 50 patients in whom preeclampsia developed had a calcium/creatinine ratio of ≤ 0.07.

Sixty eight patients in whom preeclampsia did not developed had a calcium creatinine ratio of ≤ 0.07.

This gives the calcium/creatinine ratio a sensitivity of 48.1 and specificity of 80.45%, positive predictive value of 26.08% and a negative predictive value of 91.5%.

Urine microalbumin concentration of 10 μg/ml was chosen as a predictive for the development of preeclampsia (Fig. 2).

Table (11): The predictive values of the different parameters in the study group.

	Urine calcium/ creatinine ratio < 0.07	Urine microalbumin ≥ 10 µg/ml	Calcium/ creatinine ratio < 0.07 and microalbumin ≥ 10 µg
Sensitivity %	48	72	85.70
Specificity %	80.45	91.47	97.79
Positive predictive %	26.08	54.50	66.66
Negative predictive %	91.5	95.80	99.25
Accuracy in %	40%	60%	80%

Urine microalbumin and urine calcium/creatinine ratio in table (11) showed more accuracy (80%) when both tests were combined also more positive predictive 66.66 value.