Results

The results of this work are illustrated in the following Tableles and figures:

Table (1) show comparison between patients with HIE and control group as regard clinical data. Patients with HIE showed significant increased respiratory rate compared with the control group ($P < 0.001$). ***(figure 1)*** Apgar score at 1, 5 and 10 minutes were significantly decreased in patient with HIE compared with the control group ($p < 0.001$, $p < 0.001$ & $p < 0.001$ respectively). ***(figure2)*** Where as there was no significant difference between two groups as regards other variables.

Table (2) shows comparison of arterial blood gases between patients with HIE and control group. Patients with HIE showed significant decreased Pa O_2, blood pH, serum bicarbonate levels compared with the control group ($p = 0.001$, $p = 0.001$, $p = 0.001$ respectively). Where as Pa Co_2 was significantly higher in patient with HIE versus the control group ($p = 0.001$). ***(figure 3)***

Table (3) shows comparison of urinary uric acid, urinary creatinine and urinary uric acid / creatinine ratio between patients with HIE and control group. Patients with HIE showed significant increase in urinary uric acid and urinary Ua./Cr. ratio compared with control group ($p < 0.05$, $p < 0.001$ respectively) where as urinary creatinine show insignificant decrease in HIE patients compared with control group ($p > 0.05$). ***(figure 4), (figure 5).***

Table (4) shows distribution of patients in the three subgroup of Asphyxia and their asphyxia score. Subgroup A ($n = 7 = 28\%$) with mean Asphyxia score of 13.43, subgroup B ($n = 14 = 56\%$) with mean

Asphyxia score 16.64 and subgroup C (n = 4 = 16%) with mean Asphyxia score 17.75. ***(figure 6).***

Table (5) shows mean and standard deviation of arterial blood gases parameters in different asphyxia subgroups (pH, Po_2, $PaCo_2$ & Hco_3). ***(figure 7)***

Table (6) shows mean and standard deviation of chemical parameters in different asphyxia subgroup. (urinary uric acid, urinary creatinine & urinary uric acid/ creatinine ratio). ***(figure 8).***

Table (7) shows comparison of arterial blood gases between different subgroup of asphyxia. There was significant decrease of pH, bicarbonate level with increase degree of asphyxia ($p < 0.05$, $P < 0.001$ respectively). There was significant increase of $PaCo_2$ with increase in the degree of asphyxia ($p < 0.05$). where as other parameters are in significant.

Table (8) shows comparison of chemical parameters between different subgroup of asphyxia. There were significant increase of levels of urinary uric acid and urinary uric acid/ creatinine ratio with the increase of the degree of asphyxia ($p< 0.05$, $p< 0.05$ respectively). Where as other parameter is insignificant.

Table (9) comparative study of uric acid/ ceratinine ratio between asphyxia subgroups. A vs B ($p = 0.084$), A vs C ($p = 0.027$) and B vs C ($p = 0.004$).

Table (10) show correlation coefficient between uric acid/ creatinine ratio and clinical data in the study. Ua./ Cr. ratio was significantly positively correlated with asphyxia score and stage of asphyxia and significant negative correlation with Apgar score at 1, 5 & 10 minutes. Where as no significant correlation was found between

Ua./ Cr. ratio and other clinical variable ($p < 0.01$, $p < 0.05$, $p < 0.05$, $p < 0.001$ and $p < 0.001$ respectively), ***(figure 9,10,11,12,13),***

Table (11) shows correlation coefficient between Ua./ Cr ratio and arterial blood gases. The ratio was significant negatively correlation with pH, Po_2 & Hco_3 ($p < 0.05$, $p < 0.05$ & $p < 0.05$ respectively), ***(figure 14.15).***

Table (12), (13) shows the validity test parameters on using the cut off point which was 1.43 the sensitivity, specificity, positive predictive value, negative predictive value and Accuracy (92%, 100%, 100%, 88.2% and 95% respectively).

Table (1)

Comparative study of clinical data between patients with a asphyxia and control groups

Studied parameter	Group I n=15 $\bar{X} \pm SD$	Group II n=25 $\bar{X} \pm SD$	t	p
Apgar 1	7 ± 0.92	1.6 ± 086	18.61	<0.001
Apgar 5	9.53 ± 0.52	3.65 ± 0.96	22.16	<0.001
Apgar 10	9.57 ± 0.51	5.2 ± 0.25	22.3	<0.001
Heart rate	138 ± 13.73	132.4 ± 30.86	0.66	>0.05
Respiratory rate/min	37.6 ± 2.06	59.04 ± 10.83	7.55	<0.001
Gestional age (weeks)	38.6± 0.98	38.96 ± 1.48	0.83	>0.05
Weight (grams)	3430 ± 221.84	3278 ± 357.67	1.48	>0.05
Length (cm)	48.27 ± 1.83	48.36 ± 2.69	0.12	>0.05
Head circumference (cm)	34.53 ± 1.31	34.44 ± 1.98	0.16	>0.05

P* = < 0.05 (significant)

Table (2)

Comparative study of arterial blood gases between patients with asphyxia and control group

Studied parameter	Group 1 n=15 $\bar{X}$±SD	Group 11 n=25 $\bar{X}$ ± SD	t	p
PH	7.37±0.03	7.16 ± 0.21	4.02	<0.001
P(O2)	91.66± 0.52	54.24 ± 17.78	10.02	<0.001
P(CO2)	23.06± 2.18	47.34 ± 22.18	4.2	<0.001
H(CO3)	22.4 ± 1.88	12.81 ± 6.87	5.26	<0.001

P = < 0.05 (significant)

pH : blood pH, PaO2: partial arterial oxygen tension.
PaCO2 : partial arterial carbon dioxide tension.
HCO3 : serum bicarbonate level.

Table (3)

comparative study of chemical parameters between patent with asphyxia and control group.

Studied parameter	Group I no15 $\bar{X}$ + SD (mg/dl)	Group II no25 $\bar{X}$ + SD(mg/dl)	t	P
Urinary uric acid	19.27 + 7.79	29.56 + 15.49	2.8	<0.001
Urinary creatinine	17.33 + 5.81	16.64 + 5.49	0.37	>0.05
Urinary Ua/Cr	1.07 + 0.18	1.72 + 0.46	6.34	<0.001

P = < 0.05 (significant)
Ua = uric acid , Cr = creatinine.

Table (4)

Distribution of patients in the three subgroups and their Asphyxia score

Group	No	%	Asphyxia score				
			Min.	Max.	Mean	SD	Median
Stage I (A)	7	28	8	17	13.46	3.59	15
Stage II (B)	14	56	12	20	16.64	2.41	17
Stage III (C)	4	16	13	20	17.75	3.02	19

Table (5)

Mean and stander of arterial blood gases parameters in different asphyxia subgroups.

Studied Parameter	Subgroup (A) n=7	n = 14 (B)	n= 4 (C)
	$\overline{X} \pm SD$	$\overline{X} \pm SD$	$\overline{X} \pm SD$
pH	7.29 ± 0.06	7.15 ± 0.22	6.93 ± 0.09
PaO2	62.85 ± 22.41	52.61 ± 12.37	44.9 ± 23.63
PaCO2	36.58 ± 16.97	45.38 ± 19.53	73 ± 23.31
Hco3	16 ± 2.46	11.77 ± 2.97	9.77 ± 1.48

$\overline{X}$: mean value, SD: stander, deviation
pH : blood pH, PaO2: partial arterial oxygen tension.
PaCO2 : partial arterial carbon dioxide tension, HCO3: serum bicarbonate level

Table (6)

Mean and stander deviation of chemical parameters in different asphyxia subgroups.

Studied Parameter	(A) n=7	(B) n = 14	(C) n= 4
	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$
Urinary Uric acid	26.57 ± 13.64	26.71 ± 6.71	44.75 ± 31.42
Urinary Creatinine	16.1 ± 4.17	16.78 ± 5.24	17.25 ± 9.29
Urinary Ua/Cr	1.45 ± 0.63	1.64 ± 0.39	2.45 ± 0.51

Ua: uric acid , Cr = creatinine.

Table (7)

Comperative study of arterial blood gases parameters between different subgroups of asphyxia.

Studied parameter	(A) n=14	(B) n=14	(C) n=4	F	p
	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$		
pH	7.29±0.06	7.15 ± 0.22	6.93 ± 0.09	5.66	<0.05*
P_{O_2}	62.85± 22.41	44.9 ± 23.63	44.9 ± 23.63	1.49	>0.05
P_{CO_2}	36.58± 16.97	73 ± 23.31	73 ± 23.31	4.62	<0.05*
HCO_3	16 ± 2.46	11.77 ± 2.97	9.77 ± 1.48	13.38	<0.001

P = < 0.05 (significant)

Table (8)

comparative study of chemical parameters between different subgroups of asphyxia.

Studied parameter	(A) n=7 $\bar{X}$± SD	(B) n=14 $\bar{X}$ ± SD	(C) n=4 $\bar{X}$ ± SD	F	p
Urinary Uric acid	26.57±13.64	26.71 ± 6.71	44.75 ± 31.42	4.4	<0.05*
Urinary Creatinine	16.1± 4.17	17.25 ± 9.29	17.25 ± 9.29	0.06	>0.05
Urinary U/C ratio	1.45± 0.63	1.64 ± 0.39	2.45 ± 0.51	5.68	<0.05*

P* = < 0.05 significant.

Table (9)

Comperative study of uric acid /credinine ratio between Asphyxia subgroups

	A	B	C
A		0.084	0.027
B	0.084		0.004
C	0.27	0.004	

P* = < 0.05 significant.

Table (10)

correlation coefficient between uric acid/ creatinine ratio and clinical data in the study

Studied parameters	r	P
Stage of asphyxia	0.52	P<0.01*
Asphyxia score	0.45	P<0.05*
Pluse	-0.33	p>0.05
Respiratory rate	-0.31	p>0.05
Weight	-0.49	p>0.05
Length	0.02	p>0.05
Head circumference	-0.04	p>0.05
Apgar 1	-0.31	P<0.05*
Apgar 5	-0.49	P<0.001*
Apgar 10	-0.74	P<0.001*

P*=<0.05(significant)

Table (11)

correlation coefficient between uric acid creatinine ratio and arterial blood gases

Studied parameters	r	P
pH	-0.38	P<0.05*
PO 2	-0.48	P<0.05*
PCO 2	-0.28	p>0.05
HCO 3	-0.34	P<0.05*

P*=< 0.05 (significant)

Table(12)

Validity of uric acid /creatinine ratio in diagnasis of perinatal asphyxia

UA/cr radio	Group I n=15	Group II n=25	
+ve	-	23	23
-ve	15	2	17
	15	25	40

Table (13)

Validity test parameters

Parameters :	Percent :
Specificity	100%
Sensitivity	92%
+ ve Predictive value	100%
- ve Predictive value	88.2%
Validity (Accurcy)	95%

The figures show:

Fig. *(1)* shows the mean values of respiratory rate and pulse rate in control and asphyxia groups.

Fig. *(2)* shows the mean valuse of Apgar score at 1, 5 and 10 minutes in control and asphyxia groups.

Fig. *(3)* shows the mean values pH, Po_2, Pco_2 and serum Hco_3 level in control and asphyxia groups.

Fig. *(4)* shows the mean values of urinary creatinine and urinary uric acid in control and asphyxia groups.

Fig. *(5)* shows the mean values of urinary uric acid/creatinine ratio in control and asphyxia groups.

Fig. *(6)* shows the distribution of patients according to stage of asphyxia.

Fig. *(7)* Shows mean values of pH, Po_2, Pco_2 and serum Hco_3 level in different stages of asphyxia.

Fig. *(8)* shows mean values of urinary uric acid/creatinine ratio in different stages of asphyxia.

Fig. *(9)* shows positive correlation between urinary uric acid/creatinine and stage of asphyxia **($r = 0.52$, $p < 0.01$).**

Fig. *(10)* shows positive correlation between urinary uric acid/creatinine and asphyxia score **($r = 0.45$, $p < 0.05$).**

Fig. *(11)* shows negative correlation between urinary uric acid/ creatinine ratio and Apgar score at 1 minute **($r = -0.31$, $p < 0.05$).**

Fig. *(12)* shows negative correlation between urinary uric acid/ creatinine ratio and Apgar score at 5 minutes **($r = -0.49$, $p < 0.001$).**

Fig. (13) shows negative correlation between urinary uric acid/ creatinine ratio and Apgar score at 10 minute **($r = -0.74$, $p < 0.001$).**

Fig. (14) shows negative correlation between urinary uric acid/ creatinine ratio and pH **($r = -0.38$, $p < 0.05$).**

Fig. (15) shows negative correlation between urinary uric acid/ creatinine ratio and Po_2 **($r = -0.48$, $p < 0.05$).**

Fig. (16) shows the urinary uric acid/ creatinine ratio in asphyxia and control groups.

Fig (1) Mean values of respiratory rate and pulse rate in control and asphyxia groups

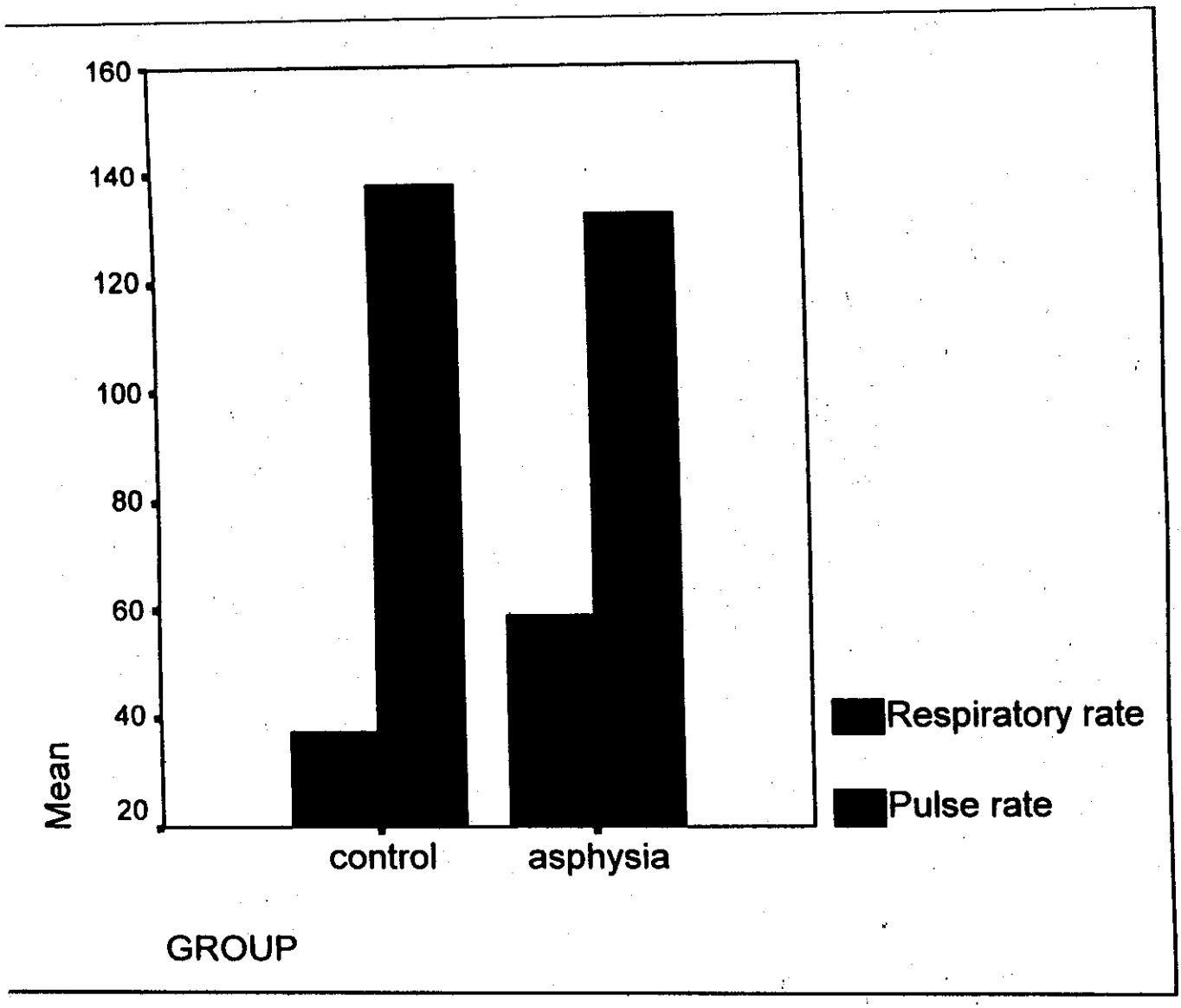
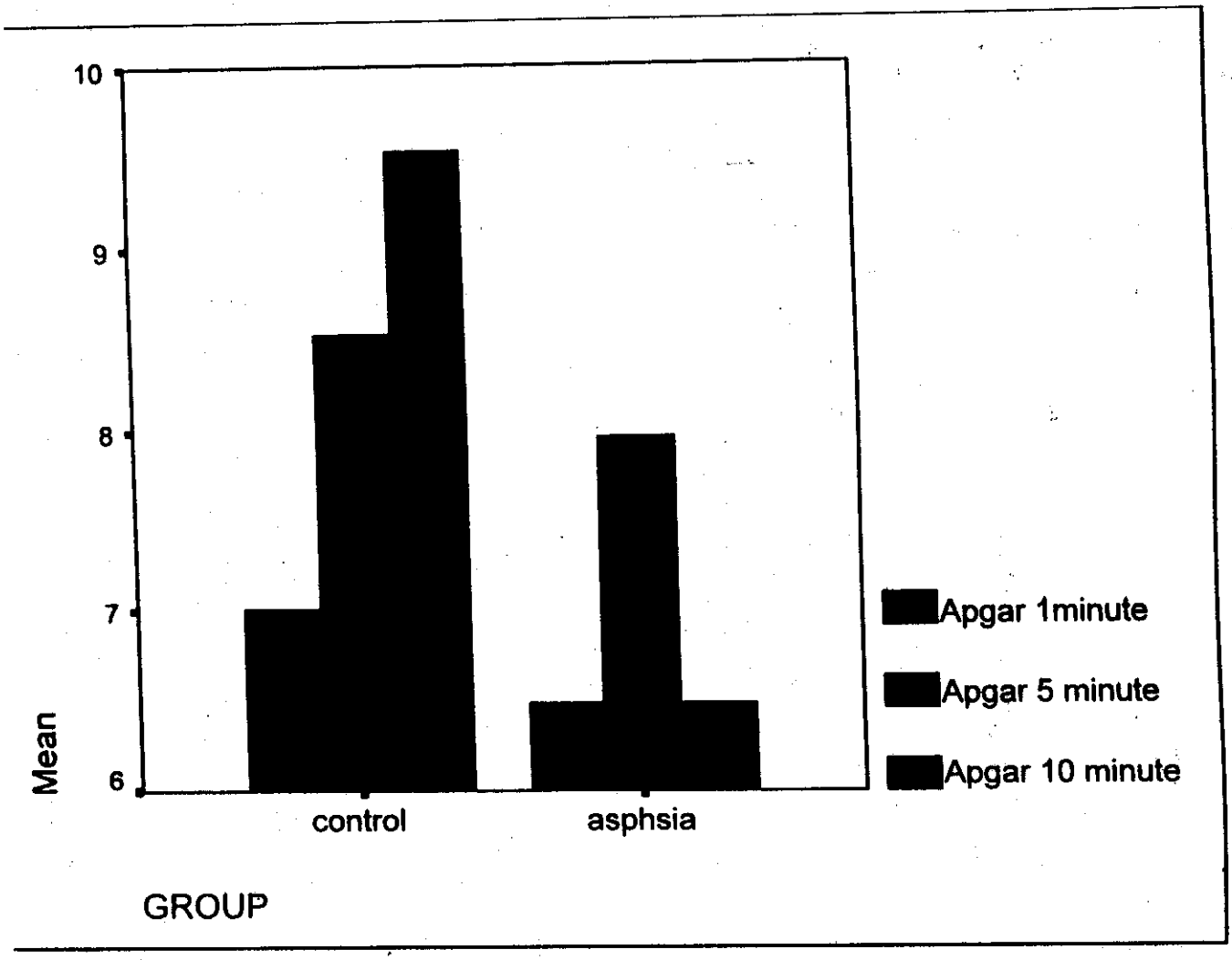
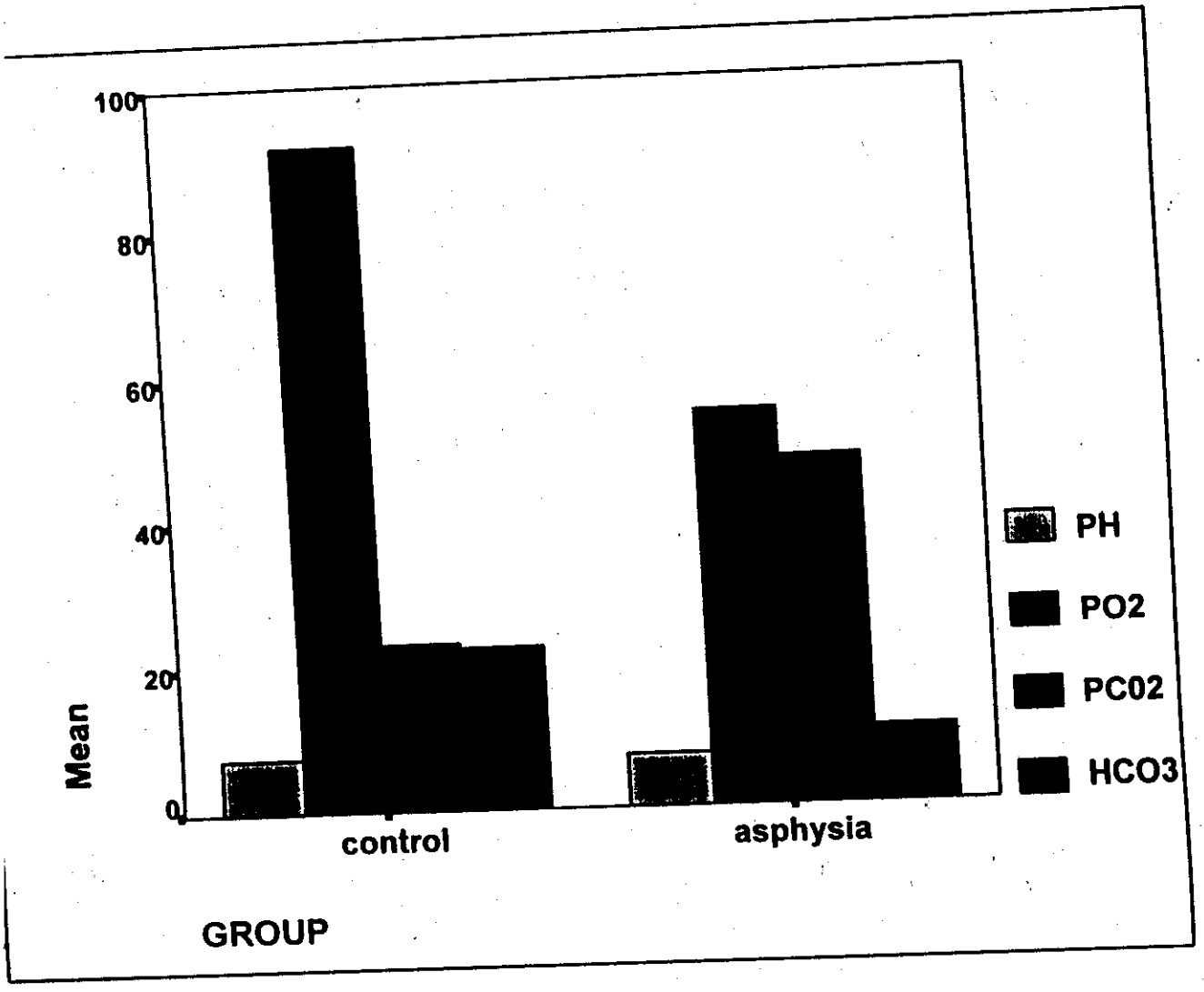


Fig (2) Mean values of Apgar at 1, 5 and 10 minutes in control and asphyxia groups.



(3) Mean values of pH, $P0_2$, Pco_2 and Hco_3 in control and asphyxia groups.



ig. (4) mean values of urinary creatinine and urinary uric acid in control and asphyxia groups.

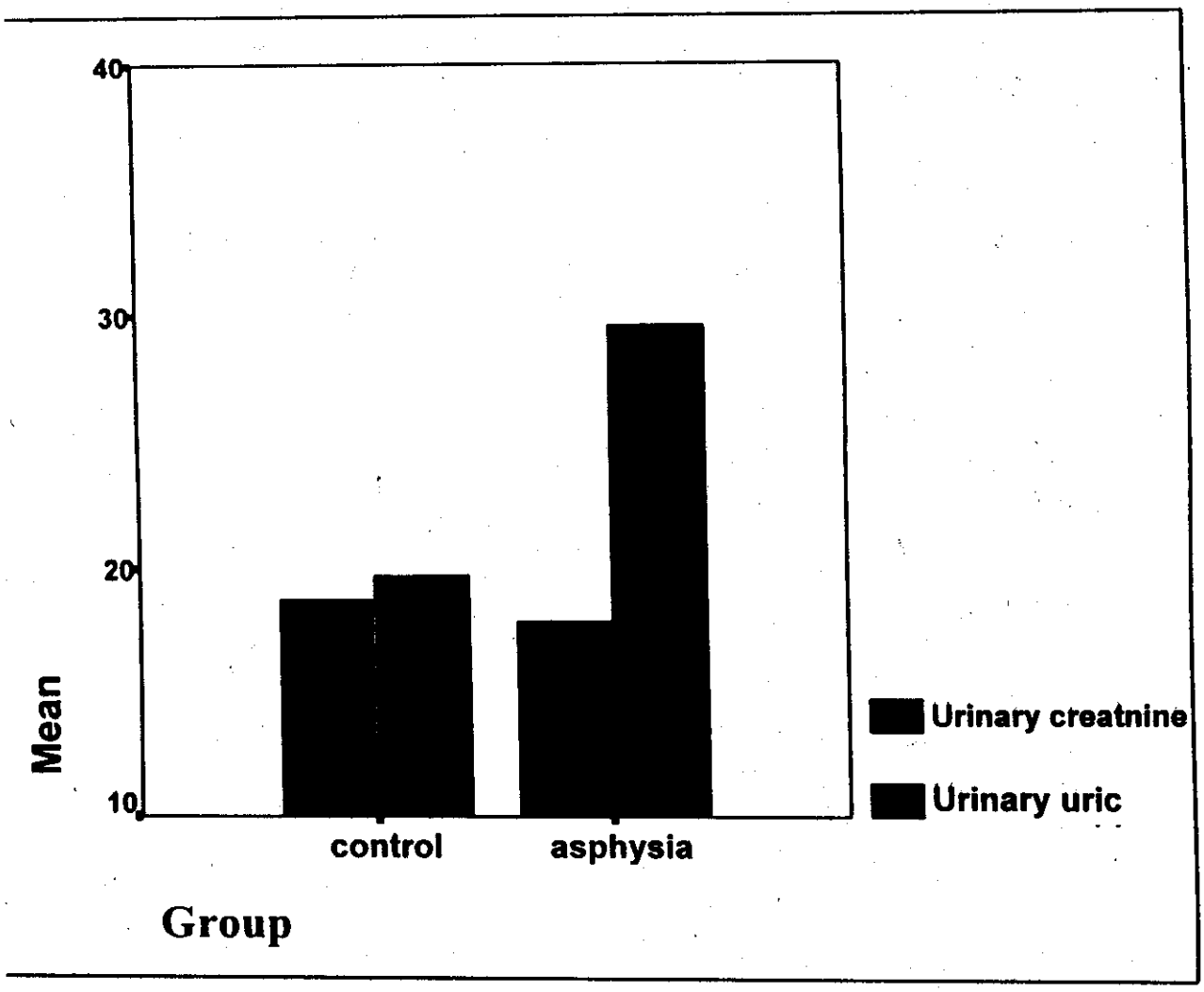


Fig. (5) mean urinary uric acid/creatinine ratio in control and asphyxia groups.

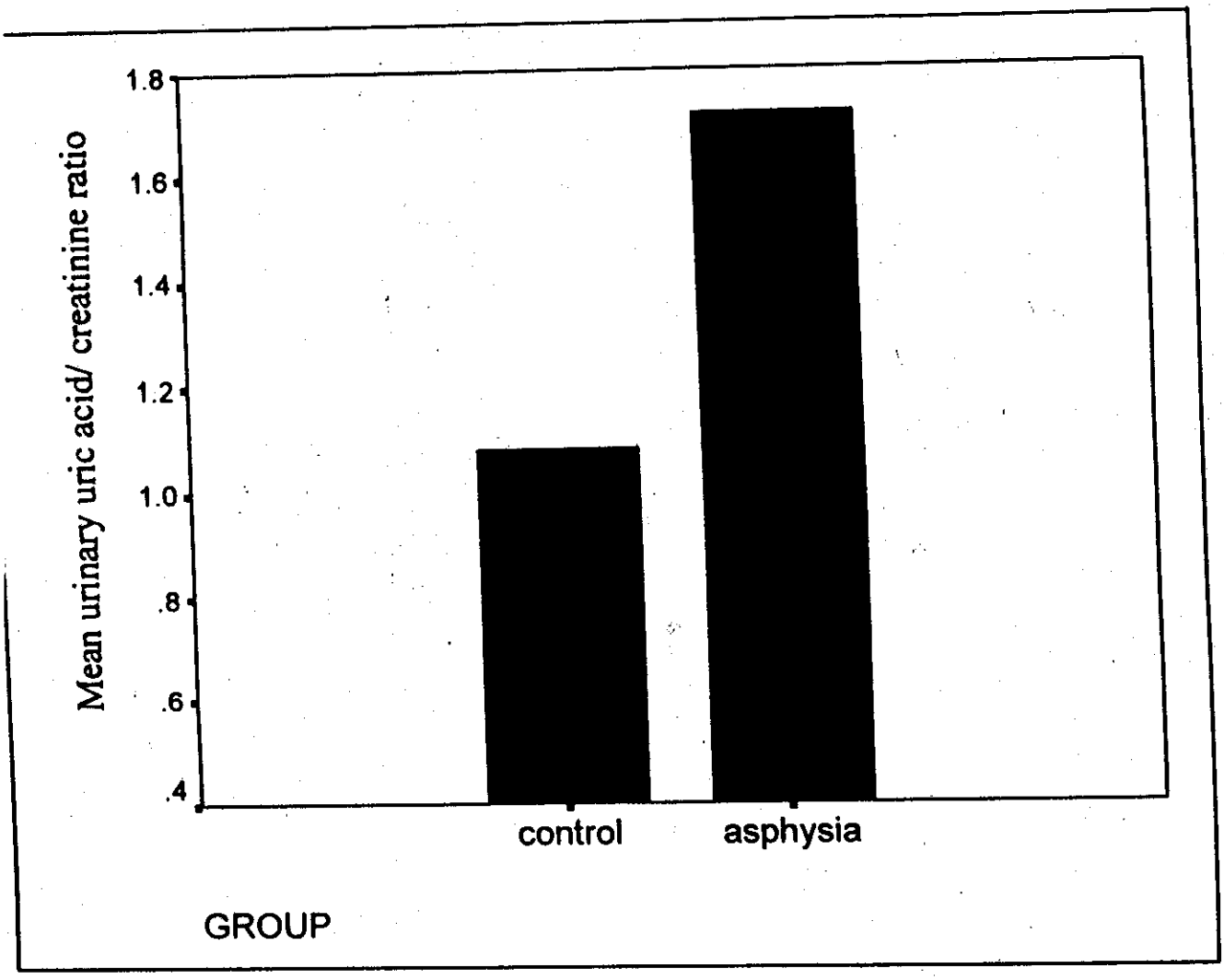


Fig. (7) mean values of pH, Po_2, Pco_2 and Hco_3 in different stages of asphyxia.

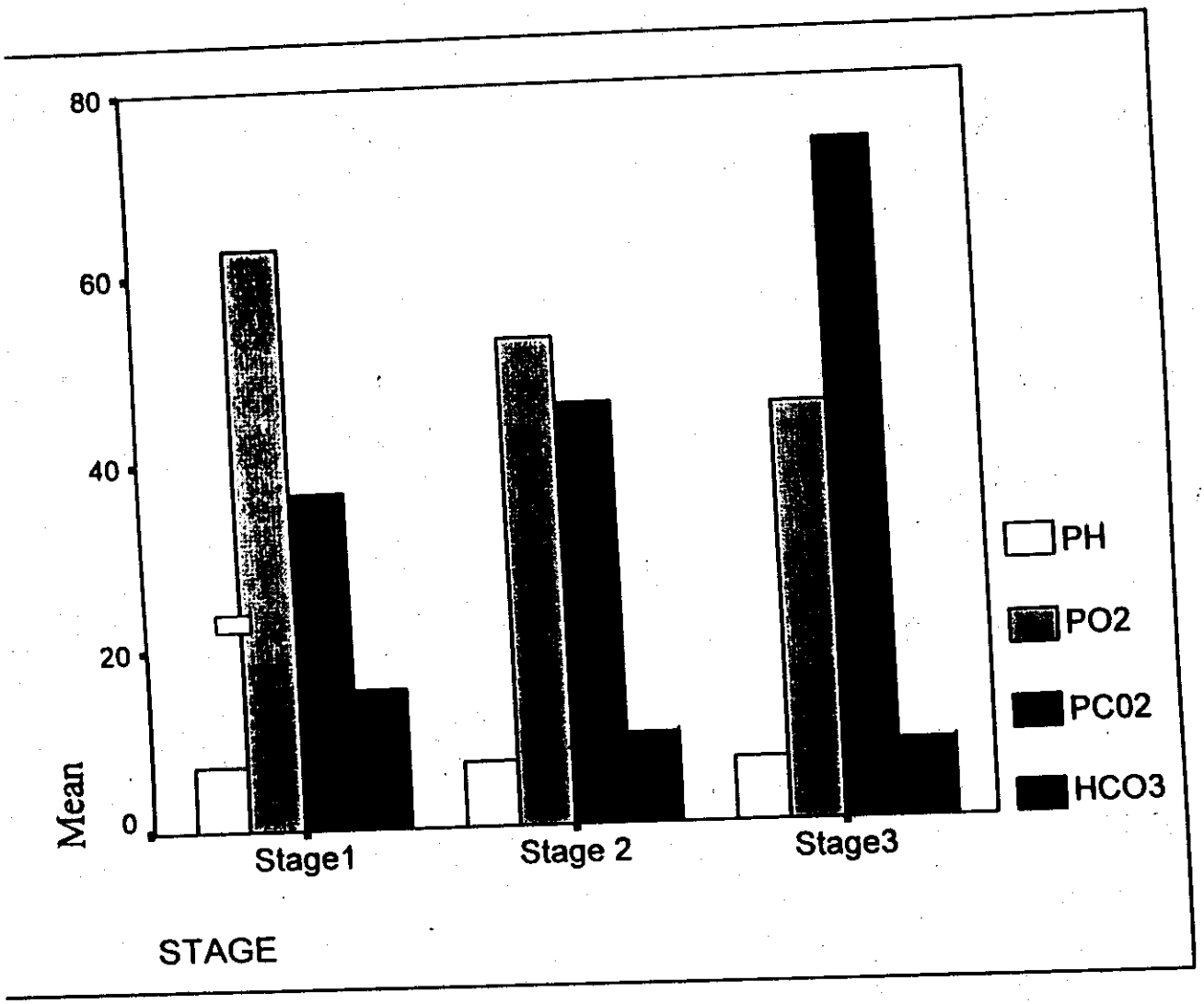


Fig. (8) Mean of urinary uric acid/ creatinine ratio in different stages of asphyxia.

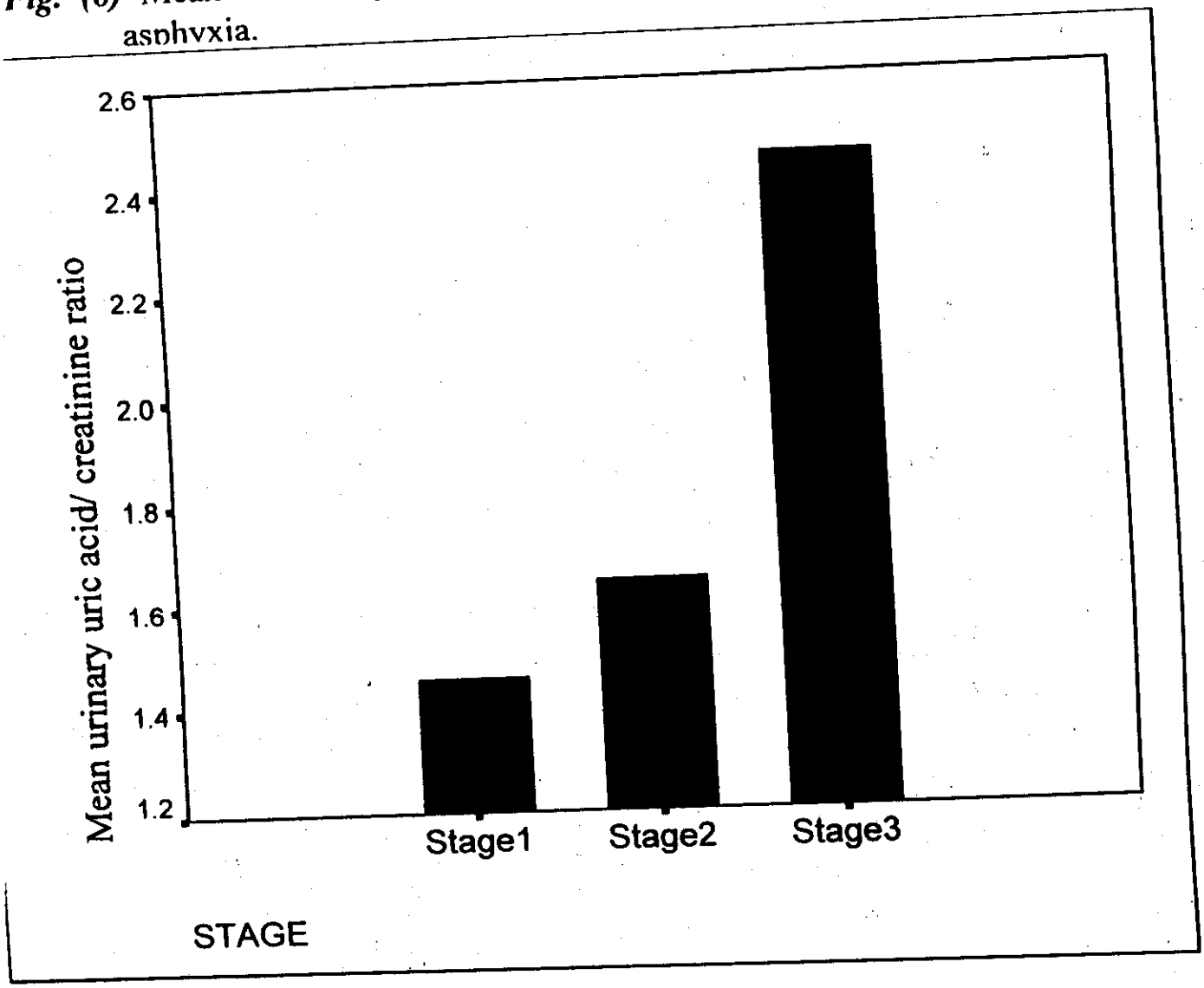


Fig. *(9)* Correlation coefficient between urinary uric acid/ creatnine ratio and stage of asphyxia.

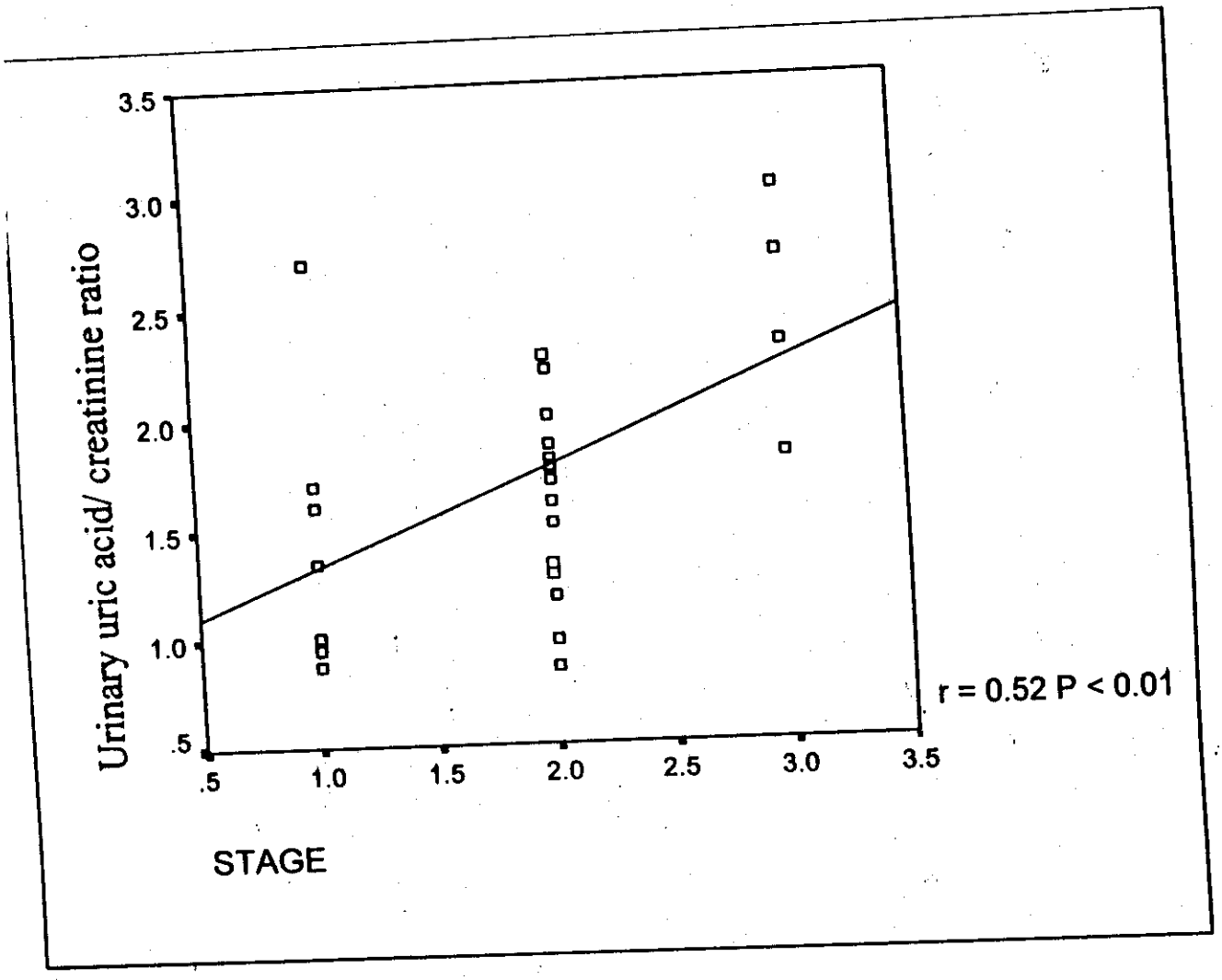


Fig. (10) correlation coefficient between urinary uric acid/creatinine ratio and asphyxia score.

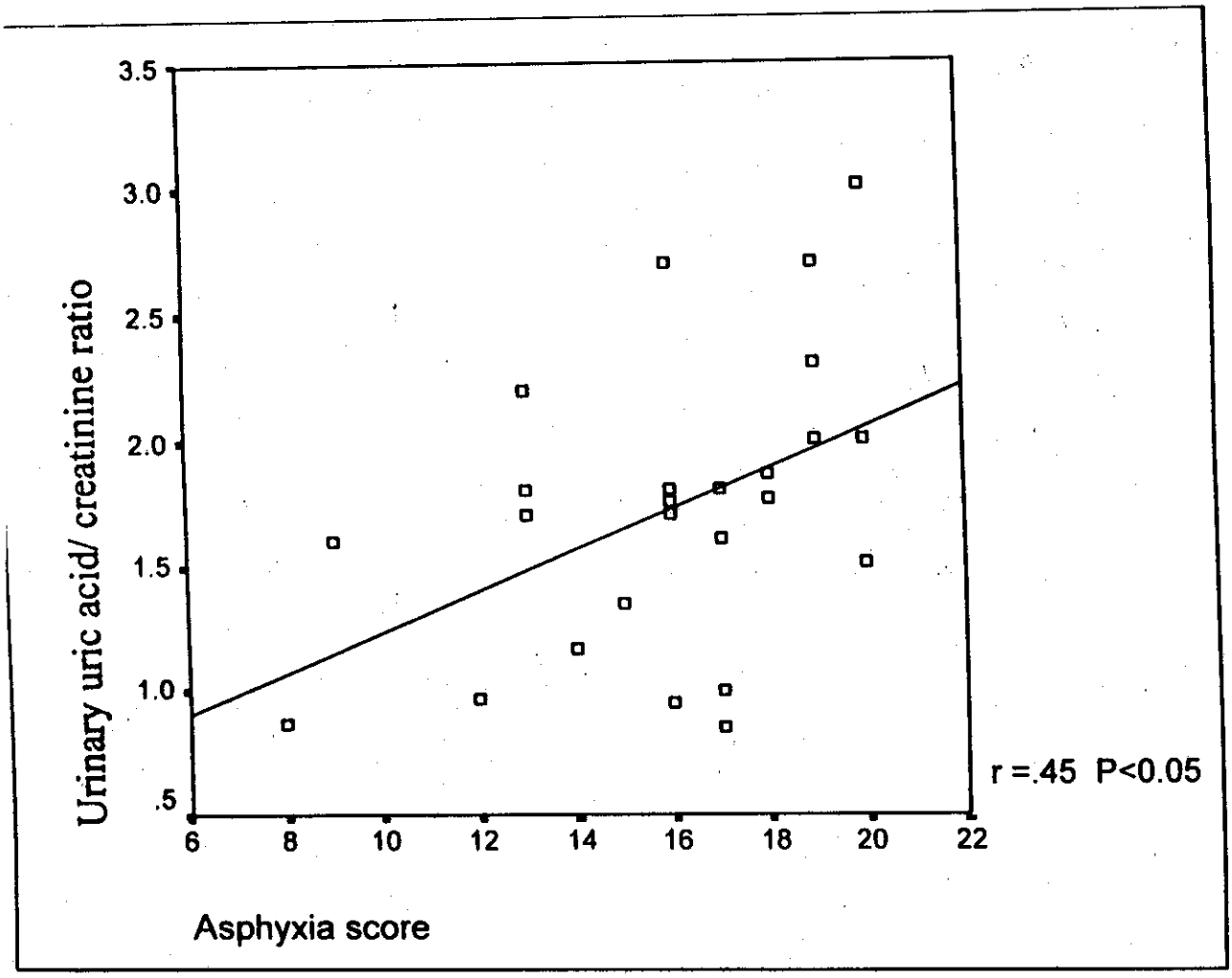
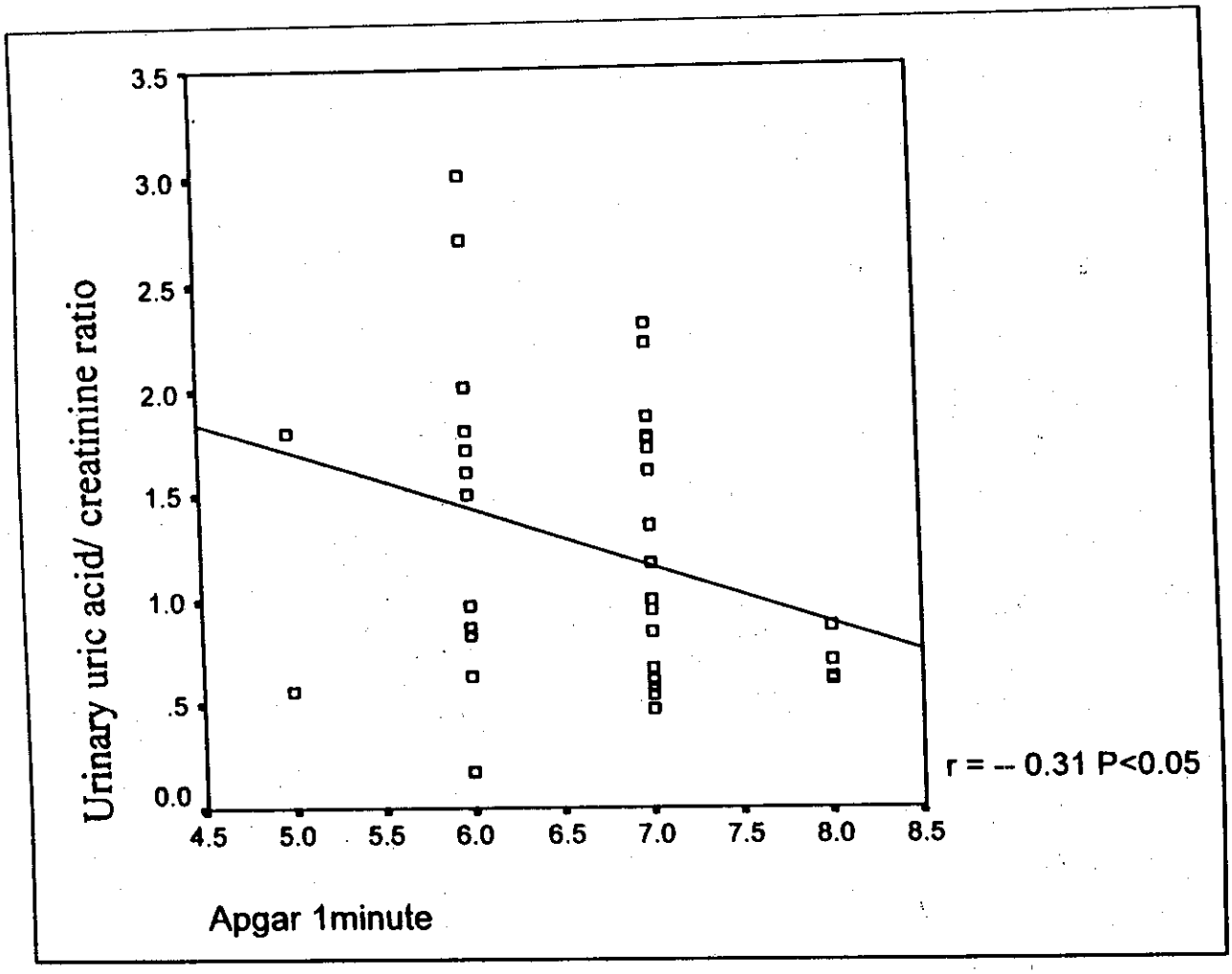


Fig. (11) correlation coefficient between urinary uric acid/ creatinine ratio and Apgar score at 1 minute.



g. *(12)* correlation coefficient between urinary uric acid/ creatinine ratio and Apgar score at 5 minutes.

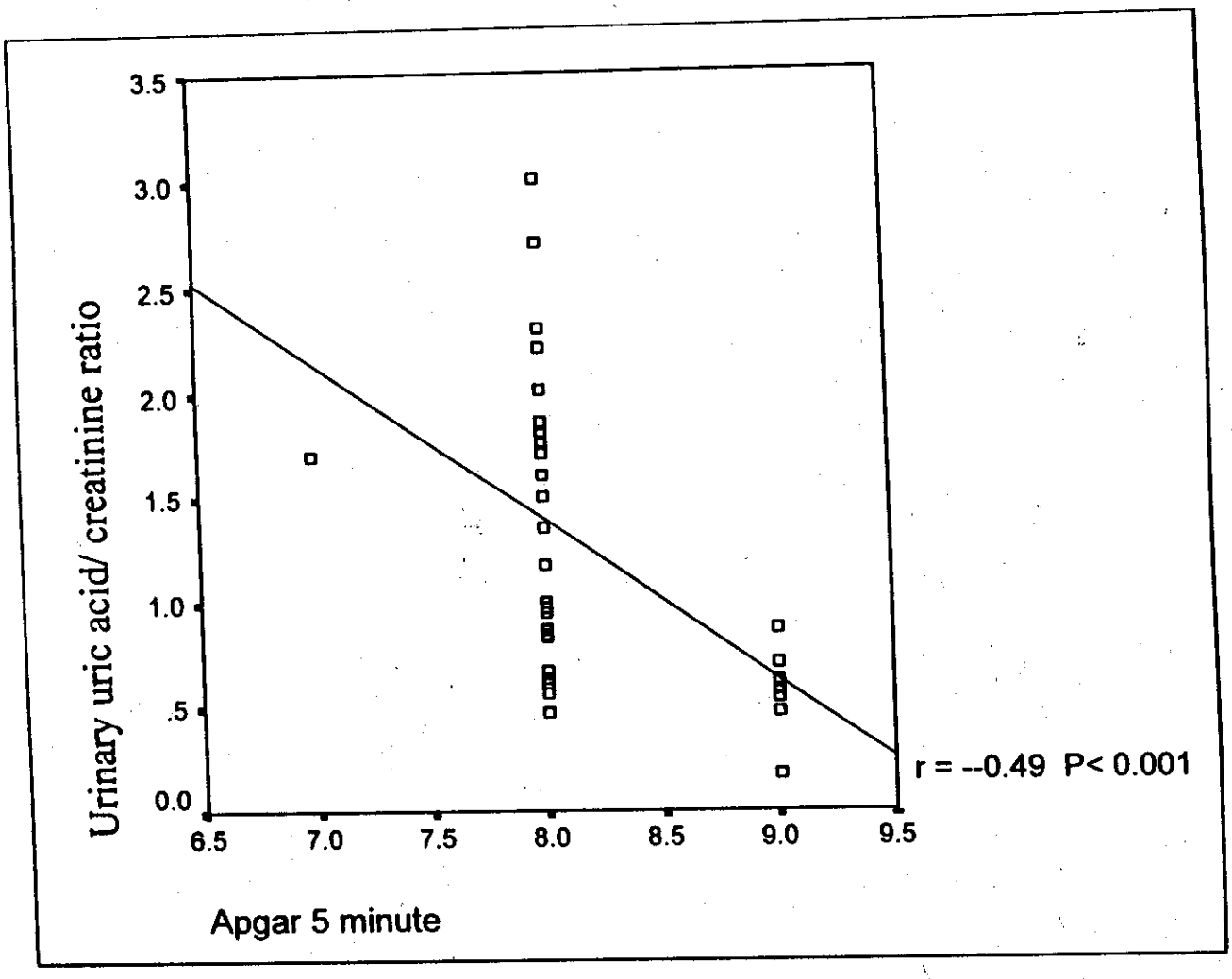


Fig. (13) correlation coefficient between urinary uric acid/ creatinine ratio and Apgar score at 10 minutes.

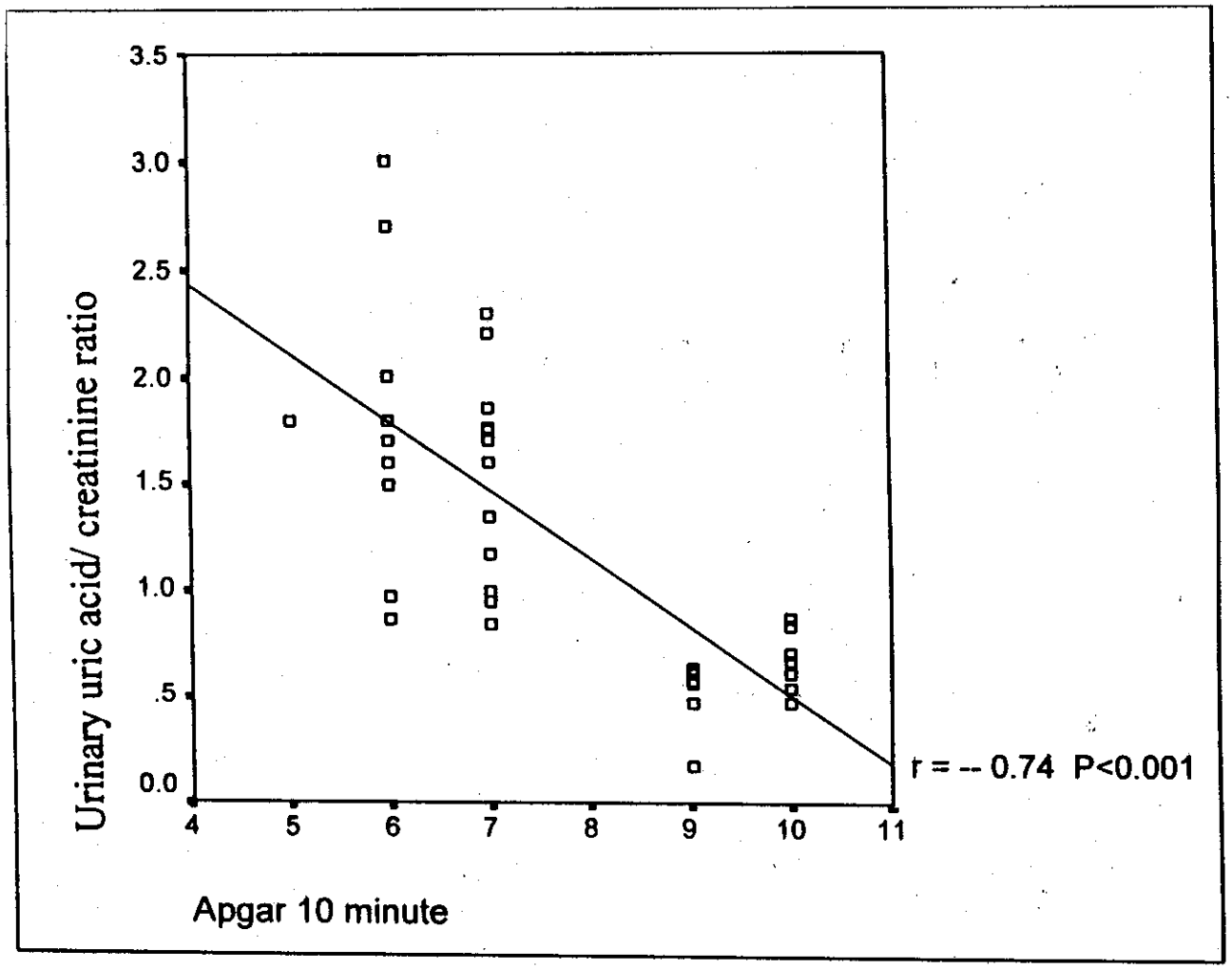


Fig. (14) correlation coefficient between urinary uric acid/ creatinine ratio and pH.

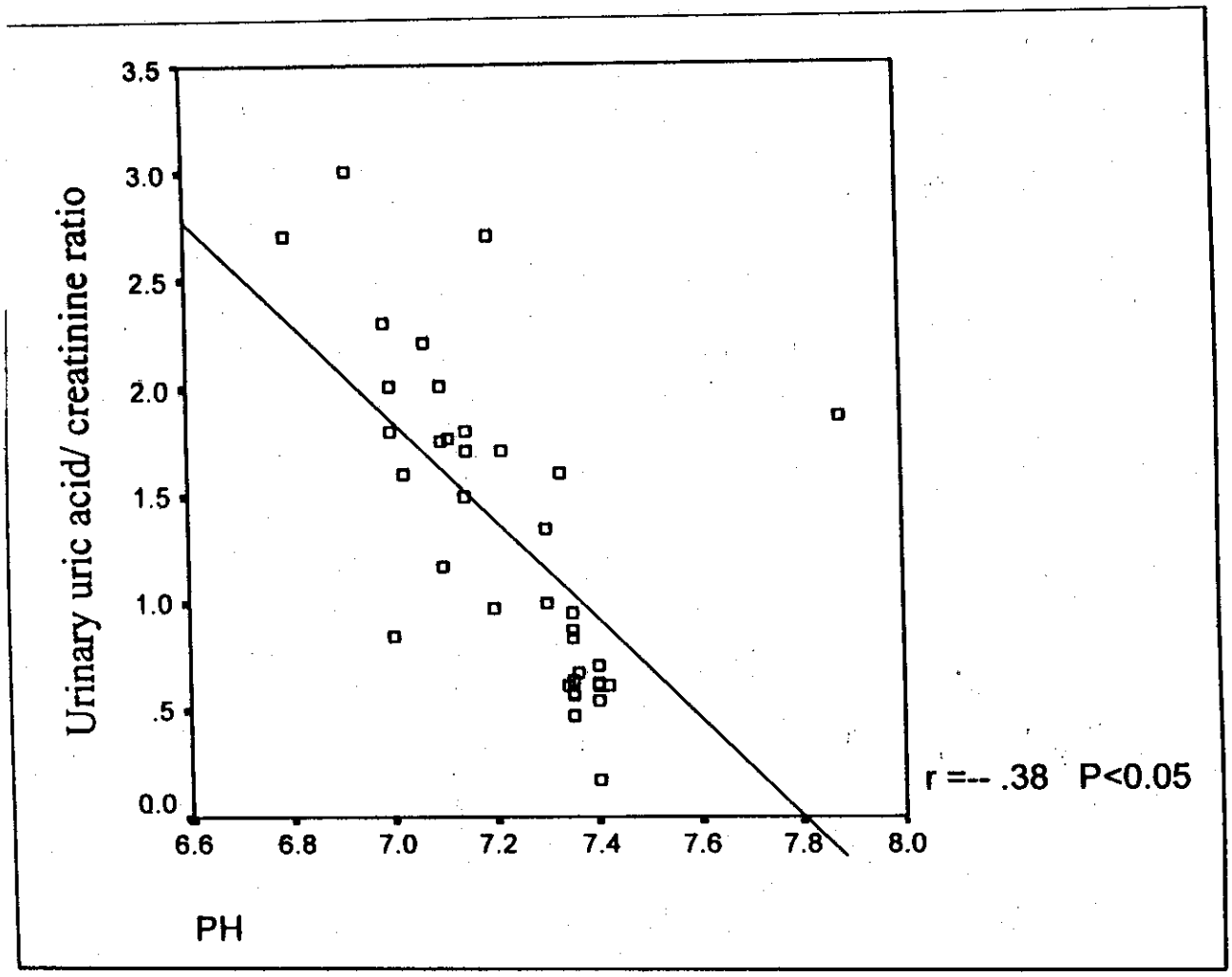


Fig. (15) correlation coefficient between urinary uric acid/ creatinine ratio and Po_2.

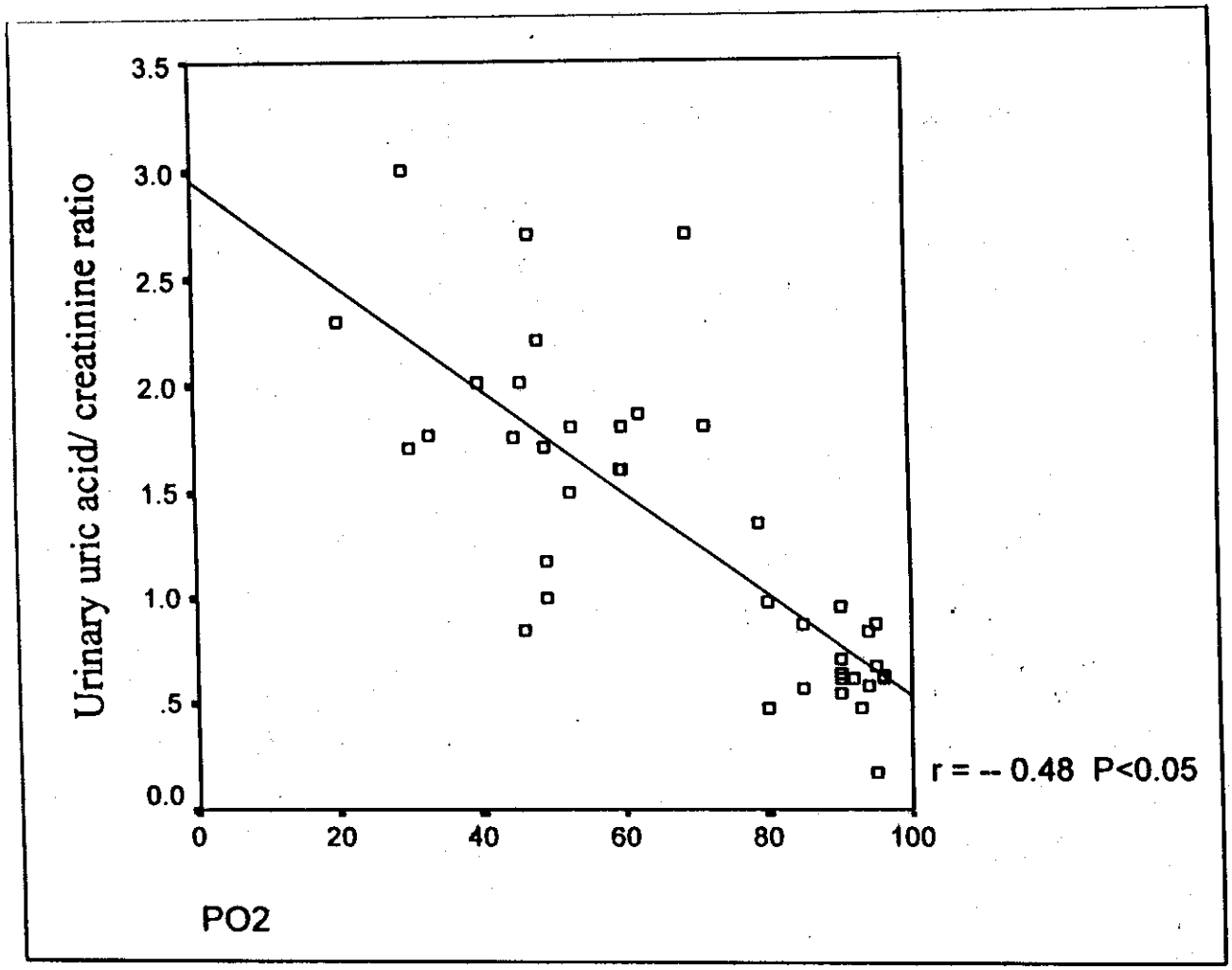


Fig. (16) : Urinary UA/Cr in asphyxia and control groups