Results

The results of the study were listed in tables (1-15) and Figures (1-21).

Table (1) Demographic characteristics of patients group. ***(n=20)***

Parameters	***Mean ± SD/%***	
- Body Weight(BW) (kg)	3.33 ±0.122	
- Gestational Age(GA) (wks)	38.8± .767	
-Gender	No.	%
Female	8	40
Male	12	60
-Mode of delivery		
Caesarian Section(C.S)	10	50
NVD(vaginal)	10	50
-Degree of HIE		
Grade I	10	50
Grade II	4	20
Grade III	6	30
-Clinical outcome		
Complete clinical recovery	14	70
partial clinical recovery	3	15
Non survivors	3	15

HIE: Hypoxic Ischemic Encephalopathy

This table shows descriptive data of the study group where their mean B.W 3.33±0.122 kg, their mean GA 38.8± 0.767 weeks, 50% delivery by CS, 50% delivery by NVD, 50% grade I HIE 20% grade II, 30% grade III, 70% complete clinical recovery, 15% partial clinical recovery and 15% non survivors.

Fig (1): Distribution of gender among patients group

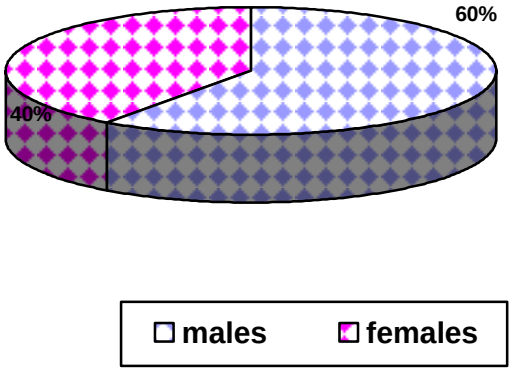

Fig (2): Distribution of grades of HIE among patients group

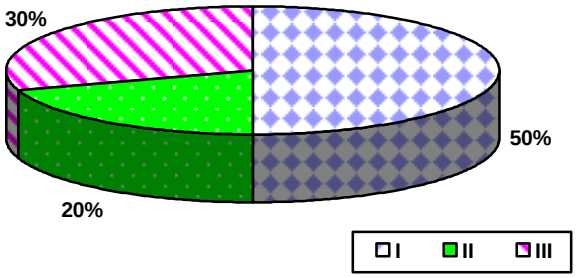

Fig (3): Distribution of outcome among patients group

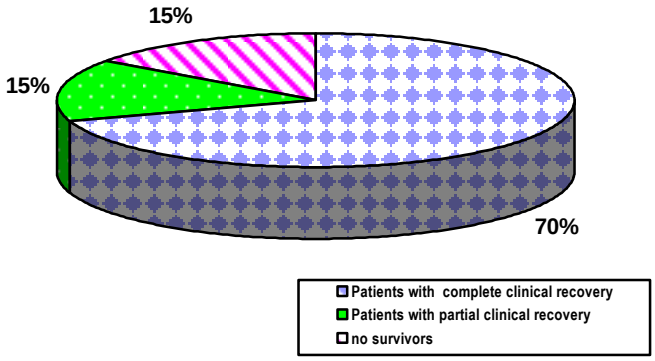

Table (2): Relation between degree of HIE and outcome.

Grades of HIE	*No. of patients*	*Outcome*		
		Recovery	*P.recovery*	*Died*
I	10	10	0	0
II	4	4	0	0
III	6	0	3	3
Total	20	14	3	3

This table shows the outcome among studied groups. All babies in grade I and grade II had complete recovery. In grade III 50% of the patients had partial recovery and50% of them died.

Table (3): Demographic characteristics of control group *(n=20)*

Parameters	***Mean ± SD/%***	
- Body Weight(BW) (kg)	3.325 ±.124	
- Gestational Age(GA) (wks)	38.650±.670	
-Gender	**No.**	**%**
Female	11	55
Male	9	45
-Mode of delivery		
Caesarean Section(C.S)	2	10
NVD(vaginal)	18	90

This table shows descriptive data of the control group. Their mean B.W was 3.325±.124 kg, mean GA 38.650±.670w, 10% delivered by CS, 90% delivered by NVD.

Fig (4): Distribution of sex among control group

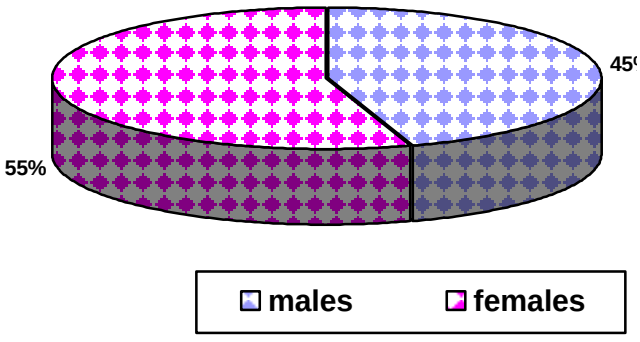

Table (4): Comparison between patient and control groups as regards clinical and laboratory parameters (t-test).

Group / *Studied parameters*	***Patient (n=20) Mean ± SD***	***Control (n=20) Mean ± SD***	***p***	***Sig.***
BW (kg)	3.335 ±0.122	3/325±0.124	0.349	N.S
GA (wks)	38.800±0.767	38.650±.670	0.173	N.S
Serum Urea (mg/dl)	39.554±11.279	30.005±2.306	0.001	Sig.
Serum Cr (mg/dl)	1.363±0.364	1.129±0.123	0.186	N.S
VEGF (pg/ml)	357.650±197.2	23.87±2.306	0.00	Sig.

BW : body weight. GA : gestational age.
Cr : creatinine
VEGF : vascular endothelial growth factor

This table shows significant increase in serum urea and VEGF in patient group when compared to control group, ($P<0.05$) whereas no significant difference was observed when comparing the other parameters.

Fig (5): Comparison between patient and control groups as regards s. urea and creatinine

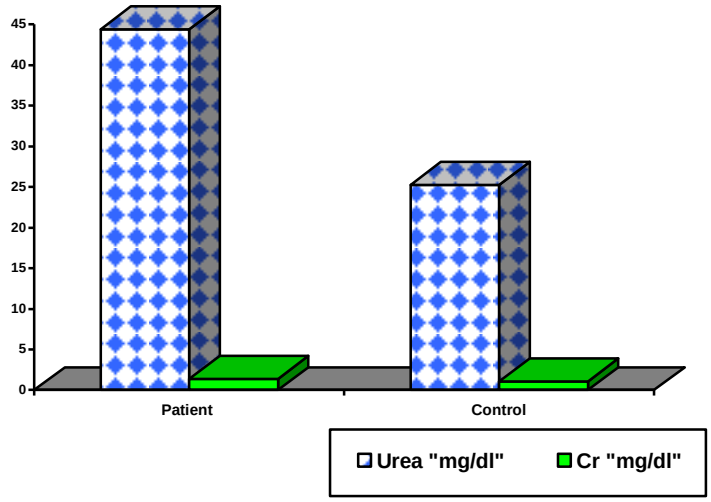

Fig (6): Comparison between patient and control groups as regards VEGF

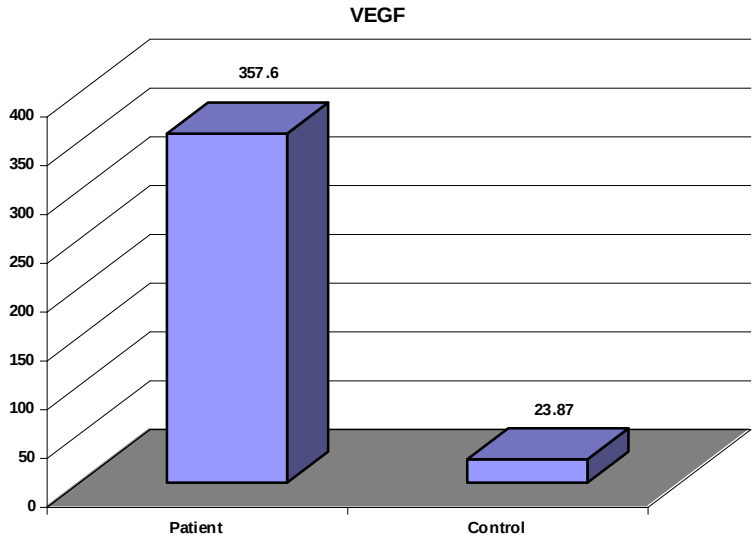

Table (5): Comparison between males and females in patient group as regards clinical and laboratory parameters (t- test)

Group / *Studied Parameters*	***Males (n=11) Mean ± SD***	***Females (n=9) Mean ± SD***	***p***	***Sig.***
BW (kg)	3.335 ±0.135	3.36±0.099	0.328	N.S
Cord-pH	7.144±.077	7.180±.099	0.003	N.S
Serum Urea (mg/dl)	41.906 ±12. 7	36.025±8.233	0.264	N.S
Serum Cr. (mg/dl)	1.448±.413	1.236±.245	0.211	N.S
VEGF (pg/mL)	399.3±.201.13	295.11±127.42	0.211	N.S

BW : body weight. GA: gestational age.
Cr : creatinine
VEGF : vascular endothelial growth factor

This table shows that gender has no effect on the level of urea, creatinine and VEGF (P>0.05).

Fig (7): Comparison between males and females in patients group as regards s. urea and creatinine

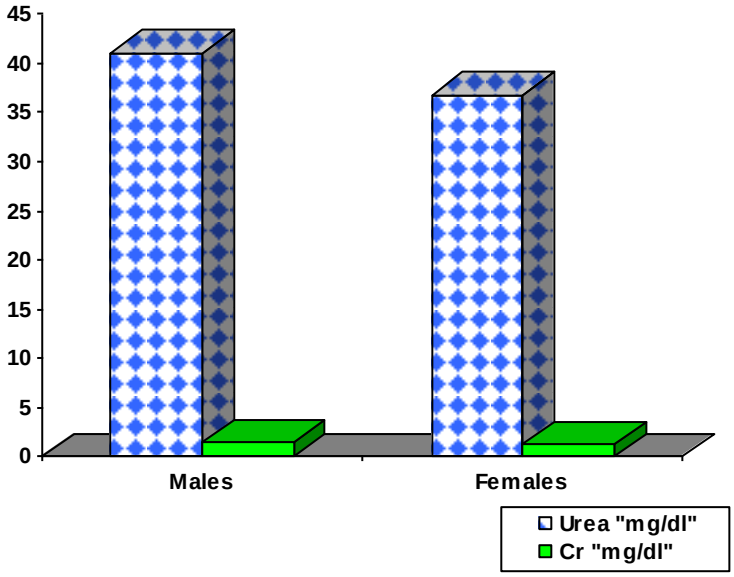

Fig (8): Comparison between males and females in patients group as regards VEGF

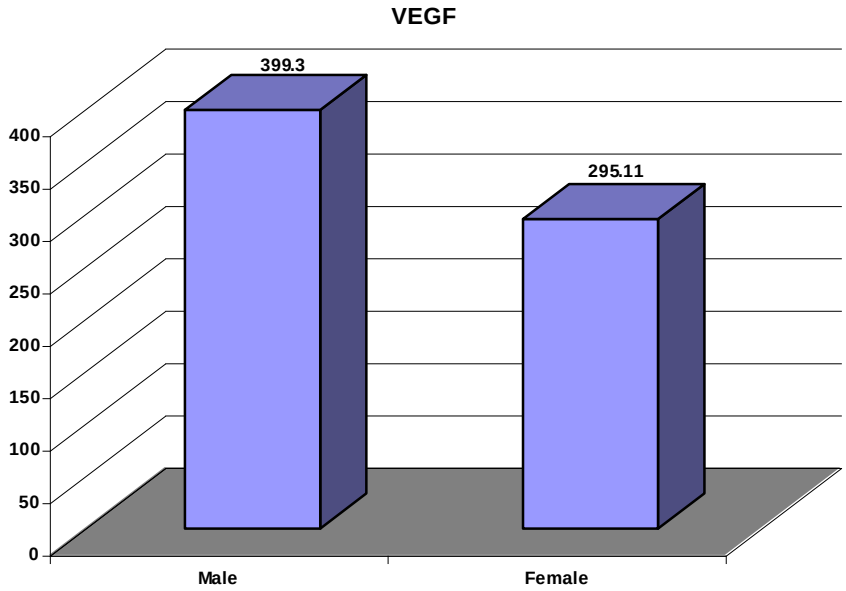

Table (6): Effect of mode of delivery on clinical and laboratory parameters (t- test)

Group / *Studied Parameters*	*Vaginal (n =10)*	*C.S (n =10)*	*p*	*Sig.*
	Mean ± SD	***Mean ± SD***		
BW (kg)	3.310±0.125	3.340±0.126	0.861	N.S
Cord-pH	7.128±0.077	7.189±.044	0.044	N.S
Serum Urea (mg/dl)	45.468±10.910	33.640±8.474	0.014	N.S
Serum Cr. (mg/dl)	1.550±0.323	1.177±0.338	0.017	N.S
VEGF (pg/mL)	421.7±160.343	293.70±181.60	0.113	N.S.

BW : body weight. GA : gestational age.
Cr : creatinine
VEGF : vascular endothelial growth factor

This table shows that mode of delivery has no effect on the level of urea, creatinine and VEGF (P>0.05).

Fig (9): Distribution of the mode of the delivery among patients group.

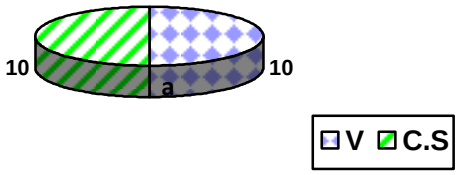

Fig (10): Comparison between those delivered vaginally and those delivered by C.S in patient group as regards s. urea and creatinine

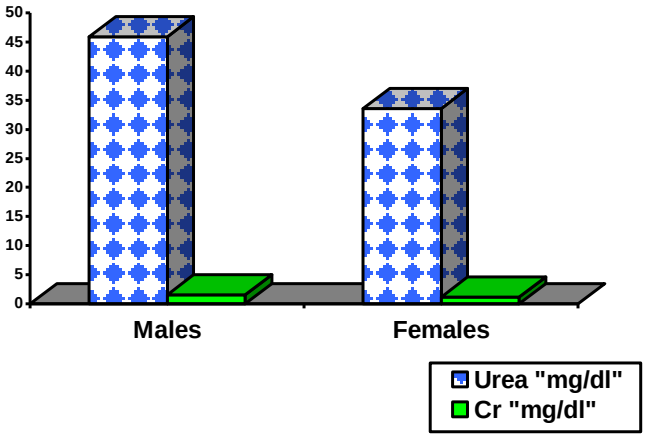

Fig (11): Comparison between those delivered vaginally and those delivered by C.S in patient group as regards VEGF

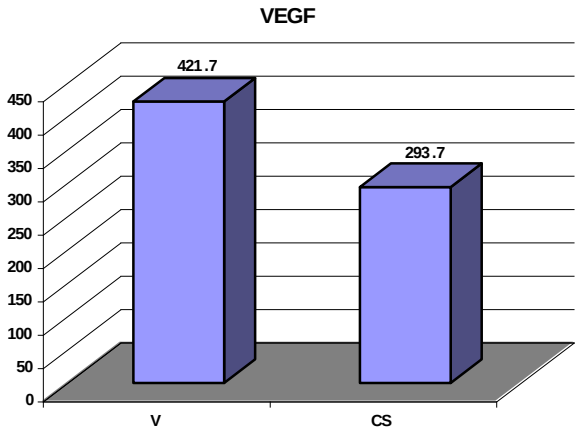

Table (7): Comparison in patients with impaired pulmonary functions and those with normal pulmonary functions as regards VEGF (t-test).

Group / *Studied Parameters*	*Patients without pulmonary support (n=24)*	*Patients with pulmonary support (n=6)*	*p*	*Sig.*
	Mean ± SD	*Mean ± SD*		
VEGF (pg/mL)	280.7.±170.6	401.4±150.45	0.069	>0.05 NS

This table shows non-significant difference in the level of VEGF between patients who needed pulmonary support (ventilator/CPAP) and those who did not need pulmonary support (P>0.05).

Fig (12): Comparison in patients with impaired pulmonary functions and those with normal pulmonary functions as regards VEGF (t-test).

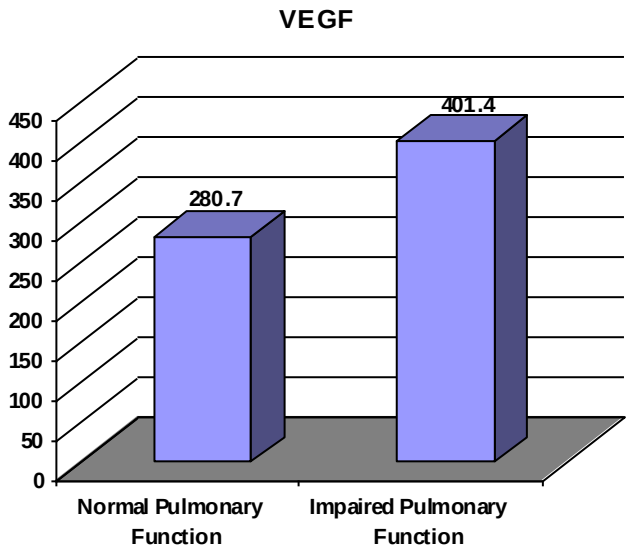

Table (8): Comparison of studied parameters between patients with different grades of HIE.

Group / *Studied Parameters*	*Grades of HIE*			*p*	*Sig.*
	I	*II*	*III*		
	n =10	*n =4*	*n =6*		
	Mean ± SD	*Means ± SD*	*Means ± SD*		
BW (kg)	3.335±0.172	3.337±0.160	3.333±0.112	0.99	N.S
Cord-pH	7.18±0.043	7.167±0.012	7.105.±.096	0.059	Sig
Serum Urea (mg/dl)	31.2±2.215	35.74±1.97	55.91±1.336	0.000	Sig.
Serum Cr (mg/dl)	1.087±0.127	1.26±0.024	1.878±0.090	0.000	Sig.
VEGF (pg/mL)	252.5±108.38	275.75±49.26	587.5±93.198	0.001	Sig

BW : body weight. GA : gestational age.
Cr : creatinine
VEGF : vascular endothelial growth factor

This table shows a significant difference between patients with different grades of HIE as regard blood urea, creatinine level, cord-Ph and VEGF being highest in grade III ($P<0.05$) while the rest of the parameters show non-significant difference ($P>0.05$).

Fig (13): Comparison between patients with different grades of HIE as regards s. urea and creatinine

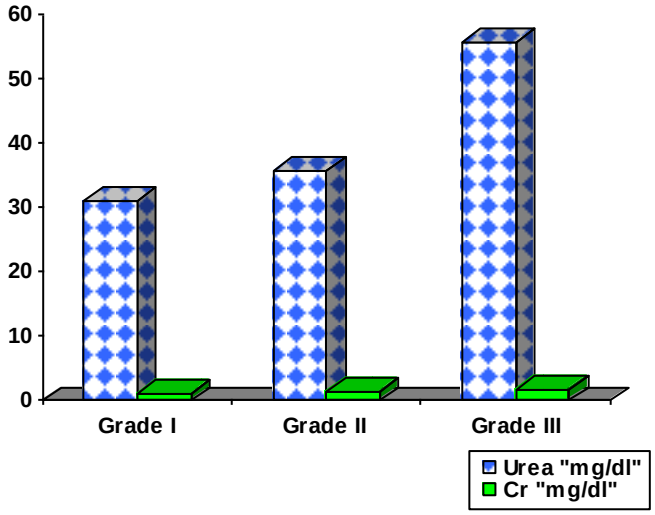

Fig (14): Comparison between patients with different grades of HIE as regards VEGF

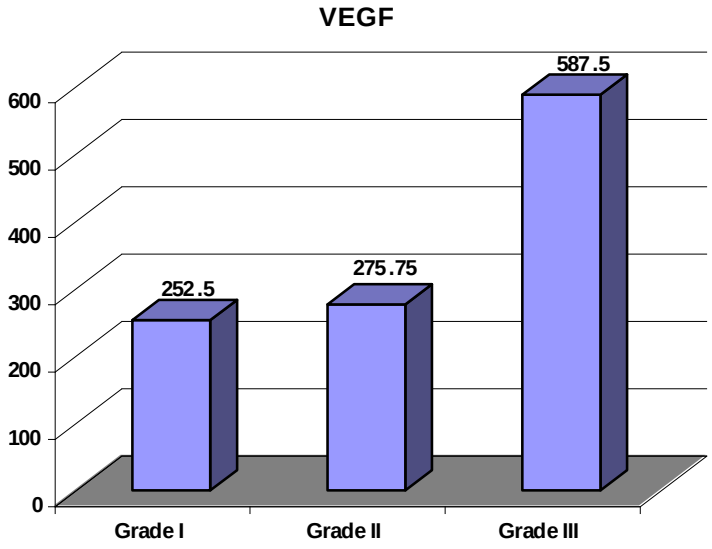

Table (9): Comparison of studied parameters among patients with different outcome.

Group / *Studied Parameters*	*Patients with complete clinical recovery (n=14)*	*Patients with partial clinical recovery (n=3)*	*Non survivors (n=3)*	*p*	*Sig.*
	Mean ± SD	*Mean ± SD*	*Mean ± SD*		
BW (kg)	3.335±0.135	3.33±0.012	3.33±0.125	0.999	N.S
Cord-pH	7.181±0.035	7.060±.038	7.158±.068	0.012	N.S
Serum Urea (mg/dl)	32.54±2.935	57.00±.600	54.833±.763	0.000	Sig.
Serum Cr (mg/dl)	1.134±0.131	1.967±0.076	1.820±0.079	0.003	Sig.
VEGF (pg/mL)	254.11±93.85	657.66±57.18	517.3±60.61	0.000	Sig.

BW : body weight. GA : gestational age.
Cr : creatinine
VEGF : vascular endothelial growth factor

This table shows a significant difference in the level of urea, creatinine and VEGF between patients with different outcomes being highest in non survivors ($P<0.05$). The other parameters show non significant difference among patients with different outcome ($P>0.05$).

Fig (15): Comparison between patients with different outcome as regards s. urea and creatinine

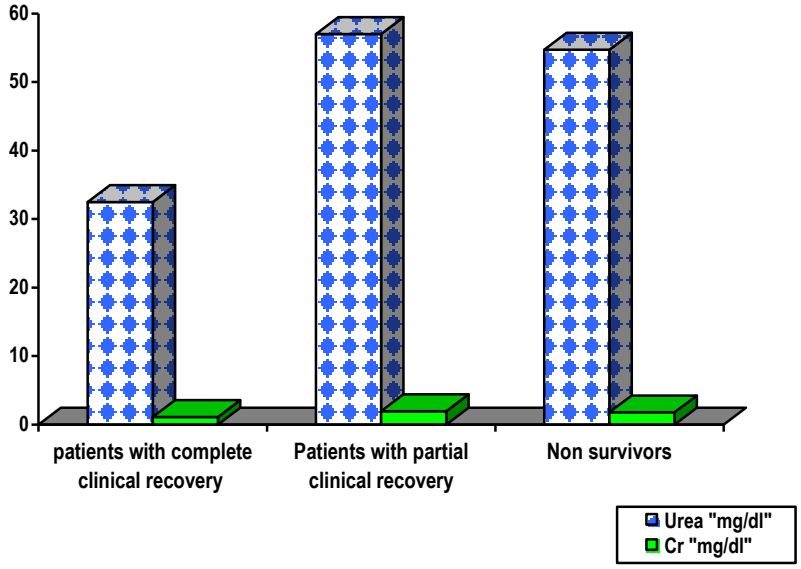

Fig (16): Comparison between patients with different outcome as regards VEGF

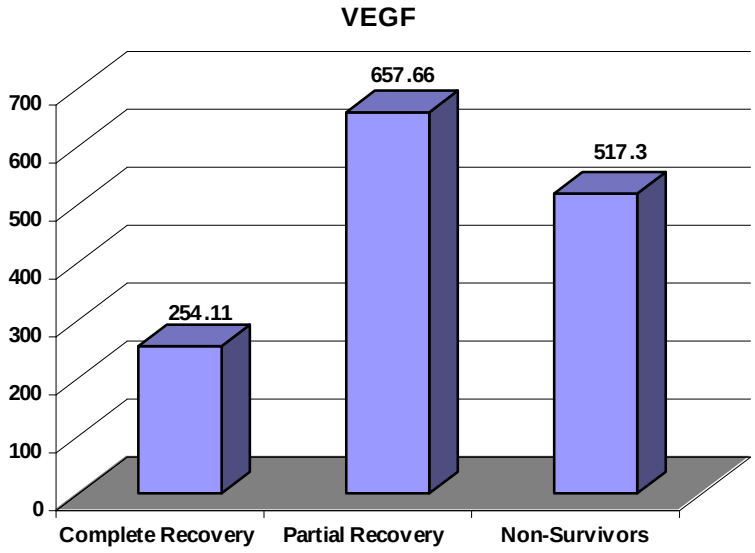

Table (10): Comparison of studied parameters between patients with different Apgar scores at one minute.

Group / Studied Parameters	Apgar score at one mine			p	Sig.
	Patients with Apgar score=2 (n=3)	Patients with Apgar score=3 (n=13)	Patients with Apgar score=4 (n=4)		
	Mean ± SD	Mean ± SD	Mean ± SD		
BW (kg)	3.333±0.125	3.346±0.133	3.300±.133	0.507	N.S
Cord-pH	7.06±0.121	7.166±.039	7.205±.033	0.009	Sig.
Serum Urea (mg/dl)	57.000±0.600	38.060±9.680	31.32±5.067	0.003	Sig.
Serum Cr (mg/dl)	1.433±0.076	1.326±0.291	1.057±0.203	0.001	Sig.
VEGF (Pg/mL)	657.66±57.106	344.53±103.48	159.000±125.17	0.000	Sig.

BW : body weight. GA : gestational age.
Cr : creatinine
VEGF : vascular endothelial growth factor

This table shows significant difference in level of urea, creatinine cord-pH, and VEGF between patients with different Apgar score at 1 minute being highest in those with lowest Apgar score at 1 minute ($P<0.05$).

Fig (17): Comparison between patients with different Apgar scores at one minute as regards s. urea and creatinine

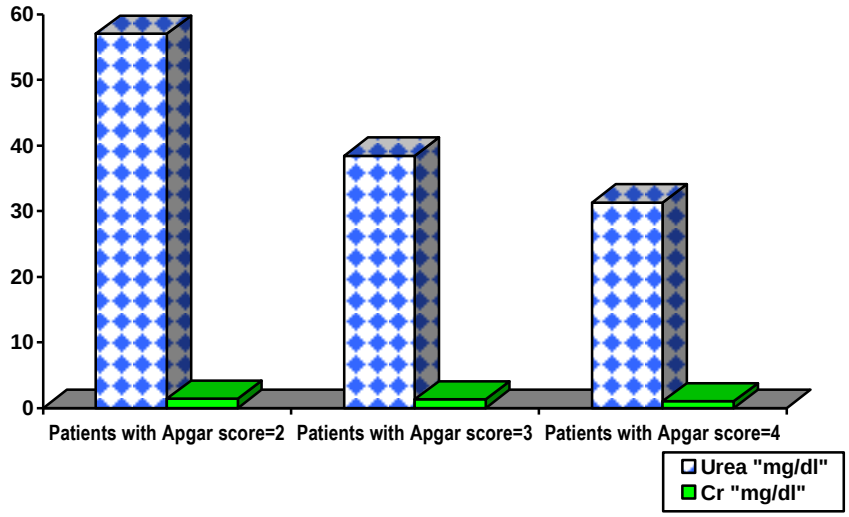

Fig (18): Comparison between patients with different Apgar scores at one minute as regards VEGF

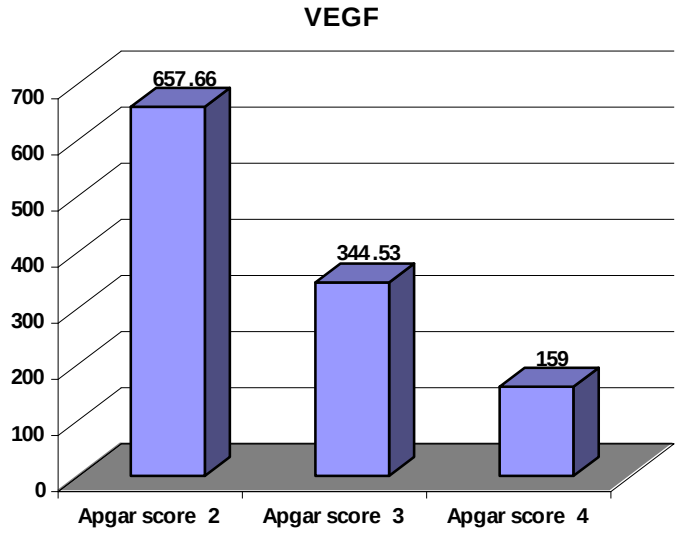

Table (11): Comparison of studied parameters between patients with different Apgar scores at 5 minutes.

Group / *Studied Parameters*	*Apgar score at 5 min*				*p*	*Sig.*
	Patients with Apgar score=5 (n=2)	*Patients with Apgar score=6 (n=8)*	*Patients with Apgar score=7 (n=7)*	*Patients with Apgar score=8 (n=3)*		
	Mean ± SD	*Mean ± SD*	*Mean ± SD*	*Mean ± SD*		
BW (kg)	3.325±0.17	3.350±0.136	3.307±0.130	3.366±0.76	0.893	N.S
Cord-pH	6.99±0.014	7.152±0.035	7.188±0.31	7.216±0.028	0.000	Sig.
Serum Urea (mg/dl)	57.00±0.84	39.49±10.24	35.871±9.14	36.66±15.01	0.116	N.S
Serum Cr (mg/dl)	1.900±0.07	1.386±0.313	1.244±0.260	1.223±0.586	0.127	N.S
VEGF (pg/mL)	630.5±45.9	382.1±156.6	307.5±68.55	227.3±305.4	0.059	Sig.

BW : body weight. GA : gestational age.
Cr : creatinine
VEGF : vascular endothelial growth factor

This table shows significant difference in cord-ph and VEGF between patients with different Apgar score at 5minutes being highest in those with lowest Apgar score at 5 minutes ($P<0.05$).

Fig (19): Comparison between patients with different Apgar scores at 5 minutes as regards s. urea and creatinine

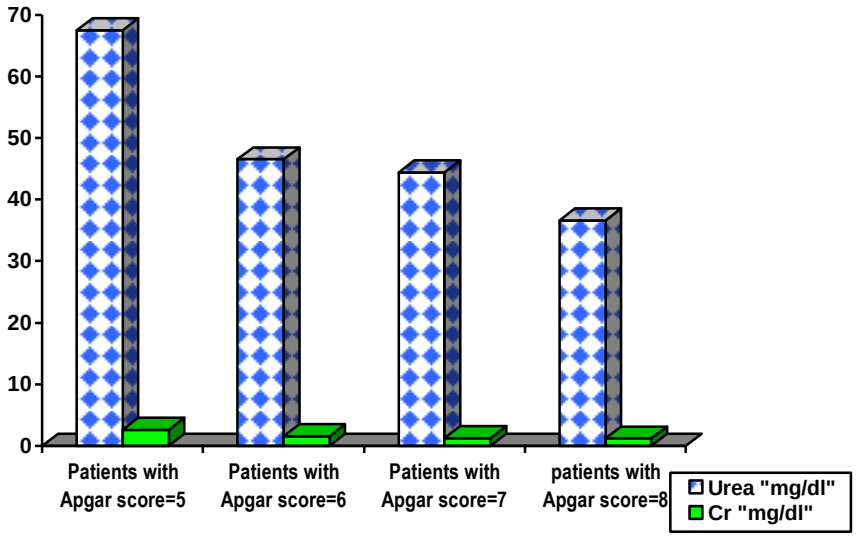

Fig (20): Comparison between patients with different Apgar scores at 5 minutes as regards VEGF

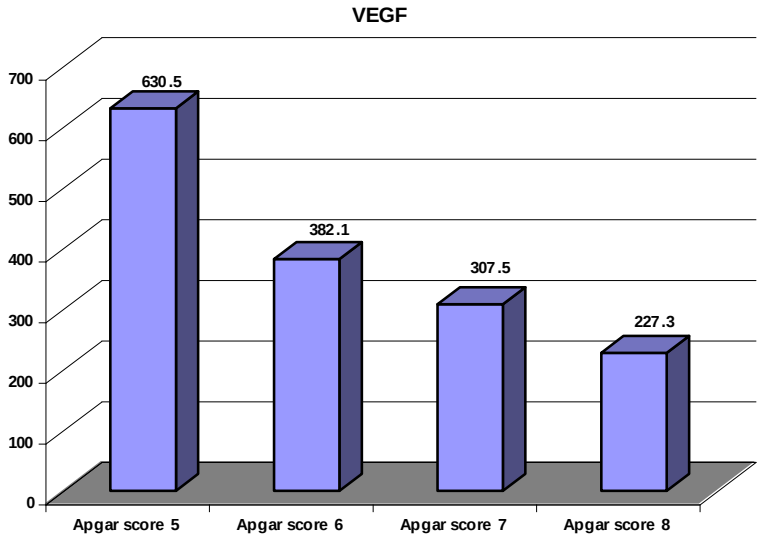

Table (12): Relation between Apgar at 5 Min. and grade of HIE in patients group (ANOVA test).

	N	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
I	10	6	8	6.90	0.733
II	4	6	7	6.250	0.500
III	5	5	7	6.166	1.169
Total	20	5	8	6.55	0.887
F		10.94			
p		0.001*			

Table (21) shows significant difference in the grade of HIE in patients group with different Apgar at 5 min. being the highest with lowest Apgar at 5 min.

Table (13): Comparison between patients with meconium stained amniotic fluid and those with clear amniotic fluid as regards VEGF (t-test)

Group / *Studied Parameters*	***Patients with* meconium stained *amniotic fluid* *n = 15***	***Patients with clear amniotic fluid* *n = 5***	***p***	***Sig.***
	Mean± SD	***Mean ± SD***		
VEGF (Pg/ml)	382.80±202.029	282.2±18.82	0.008	Sig.

This table shows significant increase in the level of (VEGF) in patients with meconium stained in comparison to those with clear A F ($P<0.05$).

Fig (21): Comparison between patients with meconium stained amniotic fluid and those with clear AF as regard VEGF

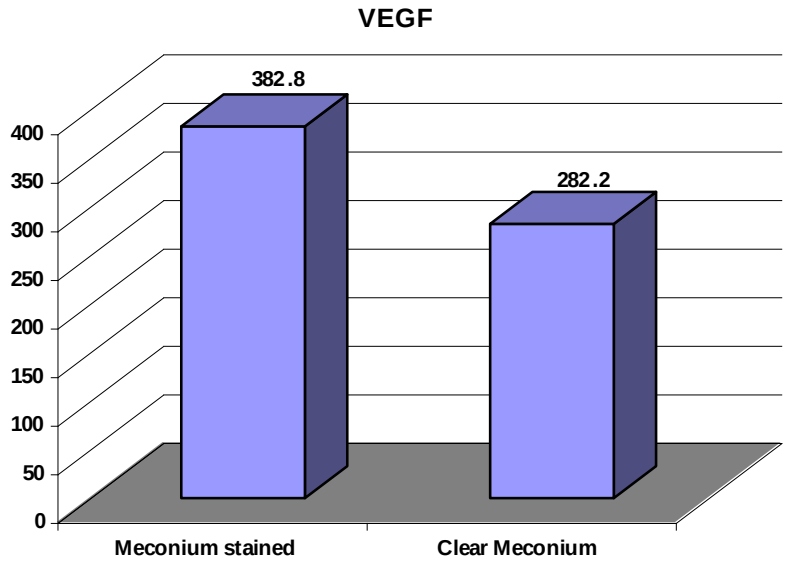

Table (14): Follow up at age of 3 months

No	Gross motor	Posture &Fine motor	Tone	Feeding	Convulsion	VEGF Pg/ml at birth
1	normal	normal	normal	oral	no	228
2	delay	delay	increased	nasogastric	anticonvulsants	459
3	normal	normal	normal	oral	no	53.1
4	non survivors					663
5	normal	normal	normal	oral	no	299
6	normal	normal	normal	oral	no	343
7	normal	normal	normal	oral	no	300
8	non survivors					712
9	normal	normal	normal	oral	no	318
10	normal	normal	normal	oral	no	254
11	normal	normal	normal	oral	no	276
12	normal	normal	normal	oral	no	315
13	non survivors					598
14	normal	normal	normal	oral	no	48.9
15	normal	normal	normal	oral	no	285
16	delay	at risk	increased	oral	no	580
17	normal	normal	normal	oral	no	350
18	normal	normal	normal	oral	no	280
19	delay	delay	increased	nasogastric	anticonvulsants	513
20	normal	normal	normal	oral	no	278

Table (15): Follow up at age of 6 months

No	Gross motor	Posture &Fine motor	Tone	Feeding	Convulsion	VEGF Pg/ml at birth
1	normal	normal	normal	oral	no	228
2	delay	delay	increased	oral	anticonvulsants	459
3	normal	normal	normal	oral	no	53.1
4	non survivors					663
5	normal	normal	normal	oral	no	299
6	normal	normal	normal	oral	no	343
7	normal	normal	normal	oral	no	300
8	non survivors					712
9	normal	normal	normal	oral	no	318
10	normal	normal	normal	oral	no	254
11	normal	normal	normal	oral	no	276
12	normal	normal	normal	oral	no	315
13	non survivors					598
14	normal	normal	normal	oral	no	48.9
15	normal	normal	normal	oral	no	285
16	delay	delay	normal	oral	no	580
17	normal	normal	normal	oral	no	350
18	normal	normal	normal	oral	no	280
19	delay	delay	increased	oral	anticonvulsants	513
20	normal	normal	normal	oral	no	278

Tables (14) & (15) show that from 20 babies, 14 babies (70%) showed normal growth and development, 3 babies (15%) showed neurodevelopmental handicap and 3 babies (15%) died in neonatal period.