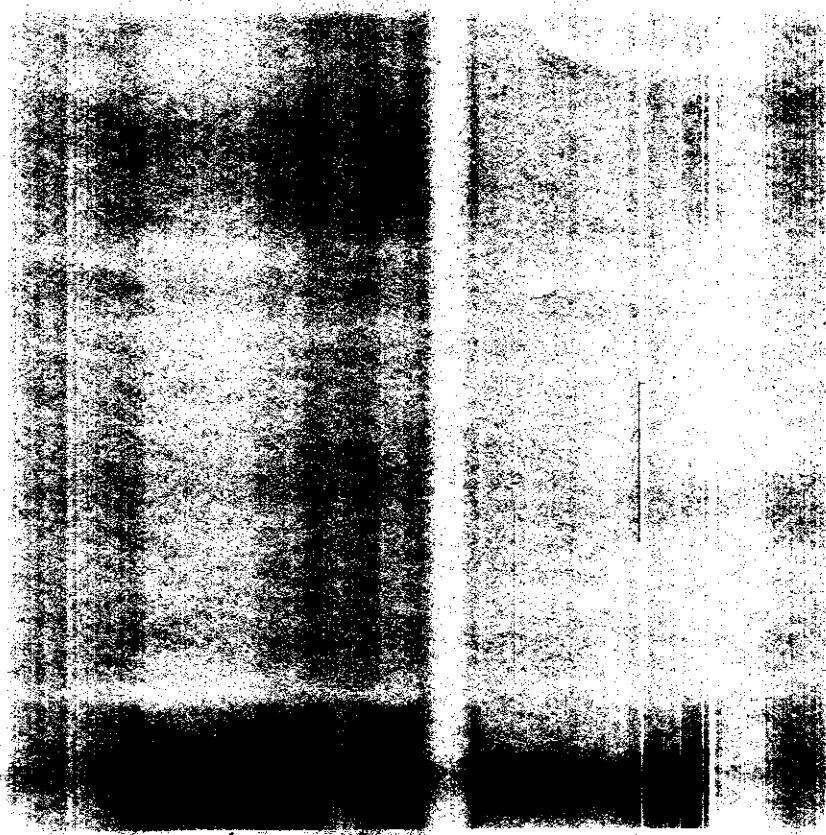
RESULTS



RESULTS

The cases were divided into 4 groups:-

I- Pregnancy induced hypertension (PIH) group:- Includes 25 cases.

II- Diabetic group: incudes 25 cases.

III- Intrauterine growth retardation (IUGR) group:- include 25 cases.

IV- Normal (control) group: includes 25 cases.

The 4 groups are selected according to following data:-

A) Age as shown in table (1).

In PIH group it was in the range of 26-37 years with a mean of 30.7 $\pm$ 3.1 years.

In diabteic group it was in the range of 25-35 years with a mean of 30.3 $\pm$ 2.2 years.

In IUGR group it was in the range of 26 - 40 years with a mean of 30.6 $\pm$ 3.5 years.

In normal control group it was in the range of 27-37 years with a mean 30.4 $\pm$ 2.5 years.

There was no statistically significant difference in age between the 4 groups ($F= 0.119$) ($P> 0.05$).

Table (1) : Mean ± SD and range of age of the studied groups

Age / Study Group	Mean (years)	S.D ±	Range		Test of significance versus control	
			Min.	Max.	t	P
PIH (n=25)	30.7	3.1	26	37	0.4532	> 0.05 (NS)
D.M (n=25)	30.3	2.2	23	35	0.1009	> 0.05 (NS)
IUGR (n=25)	30.6	3.5	26	40	0.3748	> 0.05 (NS)
Control (n=50)	30.4	2.5	27	37	--	--

F : 0.119
NS = Not significant

Table (2) : Distribution of the studied cases according to gravidity

Gravidity / Study group	< 4		> 4		Total	
	N	%	N	%	N	%
PIH	24	96	1	4	25	100
D.M	21	84	4	16	25	100
IUGR	25	100	0	0	25	100
Control	44	88	6	12	50	100
Total	114		11		125	

Table (3) : Mean + SD and range of gestational age of the studied groups

Gest. age (ws) / Study Group	Mean (weeks)	S.D	Range		Test of significance versus control	
			Min.	Max.	t	P
PIH (n=25)	35.44	2.45	30	40	0.6355	> 0.05 (NS)
D.M (n=25)	35.32	2.17	30	35	0.4597	> 0.05 (NS)
IUGR (n=25)	34.24	1.01	33	38	1.4657	> 0.5 (NS)
Control (n=50)	35.04	2.62	31	39	--	--

F : 1.424
NS = Not significant

PIH GROUP

BIOCHEMICAL DATA

Table (5) demonstrates the serum uric acid and platelet count in PIH group:-

a) Serum uric acid

In cases with normal Doppler (n= 12) it was in the range of 2-3 mg/dl with a mean of 2.47 $\pm$ 0.50 mg/dl. In cases with abnormal Doppler (n= 13) it was in the range of 2-7 mg/dl with a mean of 4.50 $\pm$ 1.57 mg/dl. There was a statistically significant difference between the 2 groups (t= 6.1332) (P< 0.01).

b) Platelet count:-

In cases with normal Doppler (n= 12), it was in the range of 150-260 (X1000/mm^3, with a mean of 240.867 $\pm$ 47.667 (X1000/mm^3). In cases with abnormal Doppler, it was in the range of 110-210 (X1000/ mm^3) with a mean of 190.058 $\pm$ 48.507 (X1000/mm^3).

There was statistically significant difference between the 2 groups (t= 2.6405) (P< 0.05).

DOPPLER RESULTS:

1) As shown in table "6", the umbilical artery range of the S/D ratio was 2.00 - 8.50 in PIH group, 2.00 - 3.10 in control group, but the mean ($\pm$SD) S/D ratio

was 3.44 ± 1.60, 2.43 ± 0.29 in PIH group, control group respectively. The mean S/D ratio showed a statistically significant difference between PIH group versus control group (P< 0.01).

2. As shown in table (7), the umbilical artery RI was in the range of 0.511-0.875, 0.49400.661 in PIH, control groups respectively, but the mean (± SD) RI was 0.654 ± 0.09, 0.578 ± 0.05 in PIH, control groups respectively. The mean RI showed statistically significnat difference between PIH group versus control group (P<0.01).

Table (4) : Comparison between cases with normal and abnormal Doppler regarding blood pressure (n= 25)

Blood pressure	Normal Doppler (n= 12)		Abnormal Doppler (n= 13)		t	P
	Range	mean ± SD	Range	mean ± SD		
Systolic B.P (mmHg)	130-155	144.2 ± 8.2	155-190	172.3 ± 13.0	6.4027	<0.01*
Diastolic B.P (mmHg)	90-105	102.08±.50	105-130	116.92 ± 7.22	6.0984	<0.01*

* Significant

Table (5) : Comparison between serum uric acid and platelet count and the result of Doppler ultrasound examination in case of PIH (n= 25)

Laboratory parameters	Normal Doppler (n= 12)		Abnormal Doppler (n= 13)		t	P
	Range	mean ± SD	Range	mean ± SD		
Serum uric acid (mg/dl)	2-3	2.47±0.50	2-7	5.40±1.75	6.1332	<0.01*
Platelet count (X 1000/mm 3)	150-260	240.867±47.667	110-210	190.058±48.507	2.6405	<0.05*

* Significant

Table (6) :

Comparison between Doppler umbilical artery S/D ratio in PIH and control groups

S/D / Study Group	Mean	S.D ±	Range		Test of significance versus control	
			Min.	Max.	t	P
PIH (n= 25)	3.44	1.60	2.00	8.50	4.3240	< 0.01*
Control (n= 50)	2.43	0.29	2.00	3.10		

* = Significant

Table (7) :

Comparison between Doppler umbilical artery RI in PIH and control groups

RI / Study Group	Mean	S.D ±	Range		Test of significance versus control	
			Min.	Max.	t	P
PIH (n= 25)	0.654	0.094	0.511	0.875	4.5812	< 0.01*
Control (n= 50)	0.578	0.050	0.494	0.661		

* = Significant

DIABETIC CASES

Twnety five patients were included in this study. The patients were classified according to White classification (White, 1965) (table "8"). Only 4 cases were uncontrolled (table 9) only 6 cases out of 25 cases had abnormal Doppler.The findings in these cases are summarised in (table 10).

Doppler results:-

1) As shown in table (11), the umbilical artery range of the S/D ratio was 2.00 - 4.40 in diabetic group, 2.00 - 3.10 in control group respectively but the mean ($\pm$ SD) S/D ratio was 2.65 $\pm$ 0.63, 2.43 $\pm$ 0.29 in diabetic, control group respectively. The mean S/D ratio showed no significant difference between diabetic group and control group ($P > 0.05$) it is to mentioned that 2 cases showed the S/D equals infinity due to absent diastolic flow and hence, they were not included in the statistical analysis.

2) As shown in table (12) the umbilical artery range of the RI was 0.401 - 0.666 in diabetic group, 0.449 - 0.661 in control group but the mean RI was 0.588 $\pm$ 0.0840, 0.578 $\pm$ 0.050 in diabetic and control groups respectively. The mean RI showed no statistically significant difference between diabetic groups versus control group ($P > 0.05$).

Table (8) :

Distribution of pregenant diabetic patients (White classification 1965) and Doppler findings

White classification	Number	Doppler findings	
		Normal	Abnormal
Class A	6	5	1
Class B	8	7	1
Class C	8	7	1
Class D	2	--	2
Class F	1	--	1
Class R	none	--	--
Total	25	19	6

Table (9) :

Distribution of diabetic cases according to control of diabetes mellitus

Distribution Diabetes	Number	Percentage
Controlled	21	84.0
Uncontrolled	4	16.0
Total	25	100.00

Table (10) :
Clinical criteria of diabetic cases with abnormal Doppler

Case No.	White classification	G.A (weeks)	fetal weight (gms)	S/D	RI
1	A/ PIH	39	3120	3.3	0.690
2	B/ PIH	36	2120	4.1	0.806
3	C/ Uncontrolled D.M	39	4650	reversed end diastolic flow velocity wavefore	--
4	D/ Ch. hypertension	37	2860	3.5	0.698
5	D/ Ch. hypertension	38	2200	3.8	0.727
6	F/ Nephropathy, Ch. hypertension	32	1065	Absent end diastolic flow velocity wavefore	--

Table (11) :

Comparison between Doppler umbilical S/D ratio in diabetic and control groups

S/D / Study Group	Mean	S.D ±	Range		Test of significance versus control	
			Min.	Max.	t	P
D.M (n= 23)*	2.65	0.63	2.00	4.40	1.5565	> 0.05 (NS)
Control (n= 50)	2.43	0.29	2.00	3.10		

NS = Not significant
* 2 cases with absent flow are excluded from statistical study

Table (12) :

Comparison between Doppler umbilical RI ratio in diabetic and control groups

RI / Study Groups	Mean	S.D ±	Range		Test of significance versus control	
			Min.	Max.	t	P
D.M (n= 23)	0.588	0.0840	0.401	0.665	0.5450	> 0.05 (NS)
Control (n= 50)	0.578	0.050	0.494	0.661		

NS = Not significant
* 2 cases with absent flow are excluded from statistical study

INTRAUTERINE GROWTH RETARDATION GROUP "IUGR"

Twenty five patients were included in this study. The patients of asymmetrical type were selected in this study. The clinical criteria are summarised in table (13,14).

Doppler results:-

1) As shown in table (16) the umbilical artery range of the S/D ratio was 2.30 - 4.30 in IUGR group, 2.60 - 3.10 in control group but the mean ($\pm$ SD) S/D ratio was 3.81 $\pm$ 1.05, 2.43 $\pm$ 0.29 in IUGR and control groups respectively. The mean S/D ratio showed a statistically significant difference between IUGR versus control group ($P< 0.01$). It is to be mentioned that 7 cases showed the S/D ratio equals infinity due to absent diastoic flow and hence, they were not included in the statistical analysis.

2) As shown in table (17), the umbilical artery RI was in the range of 0.752 - 0.854, 0.494 - 0.661 in IUGR, control groups respectively, but the mean ($\pm$ SD) RI was 0.687 $\pm$ 0.18, 0.578 $\pm$ 0.05 in IUGR, control groups respectively. The mean RI showed a statistically significant difference between IUGR group versus control group ($P< 0.01$).

able (13) :

Clinical criteria of IUGR and control groups

Clinical Parameters	IUGR (n= 25)		Control (n= 50)		t	P
	Range	mean ± SD	Range	mean + SD		
Weight (Kg)	63-93	80.5 + 6.5	63 - 95	81.3 + 7.2	0.484	>0.05 (NS)
Height (cm)	153-169	161.3 + 4.7	153-168	159.8 + 5.4	1.258	>0.05 (NS)
Symphyseal fundal height (cm)	26 - 30	27.5 + 1.3	28 - 34	32.1 + 2.1	11.653	<0.01*

* = Significant
NS = Not significant

ble (14) :

Mean value of B.P.D, H.C, A.C, HC/AC and EFW in IUGR and control groups

ultrasonic parameters	IUGR (n= 25)		Control (n= 50)		t	P
	Range	mean ± SD	Range	mean ± SD		
3.PD (cm)	7.10-8.70	7.98 ± 0.82	7.60-9.40	8.58 ± 0.60	2.3908	<0.05*
HC (cm)	24.70-30.20	28.43 ± 1.67	29.0-37.50	31.55 ± 1.63	7.7273	<0.01*
AC (cm)	24.40-47.40	25.53 ± 0.92	25.30-34.0	30.19 ± 2.25	9.4782	<0.01*
HC/AC	0.95-1.19	1.11 ± 0.06	0.93-1.32	1.04 ± 0.82	3.3766	<0.05*
EFW (gm)	1333-2115	1641.76±180.16	1543-3606	2358.49 ± 807.89	4.3678	<0.01*

* = Significant
BPD : Biparietal diameter
HC : Head circumference

ible (15) : Systolic - Diastolic Ratio (S/D) in IUGR (% of cases)

S/D ratio	Number	Percentage
Normal	5	20.0
Increased	13	52.0
Absent end diastolic flow	7	28.0
Total	25	100.00

Table (16) : Comparison between Doppler umbilical artery S/D ratio in IUGR and control groups

S/D Study Group	Mean	S.D ±	Range		Test of significance versus control	
			Min.	Max.	t	P
IUGR (n= 18)**	3.81	1.05	2.30	4.30	8.45	< 0.01*
Control (n= 50)	2.43	0.29	2.60	3.10		

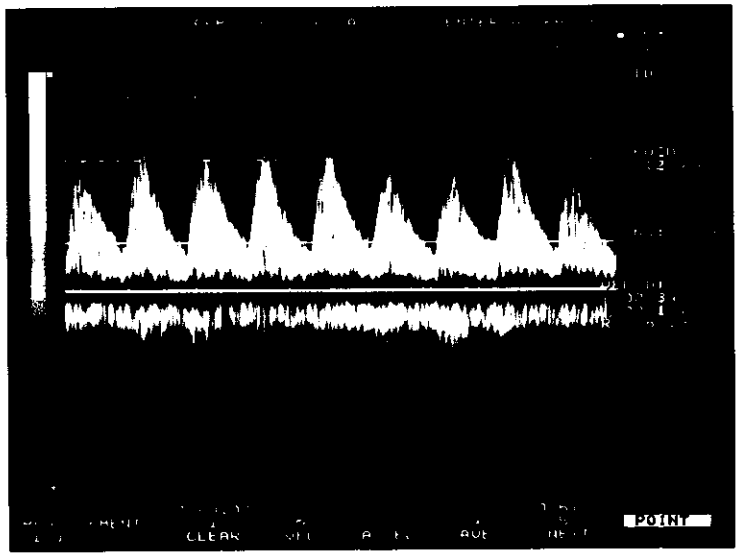
* = Significant
** 7 cases with absent flow are excluded from statistical study

Table (17) :

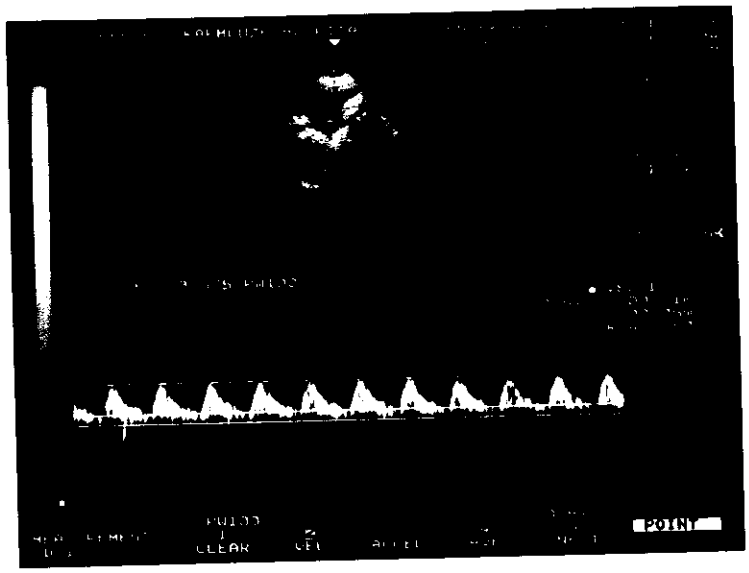
Comparison between Doppler umbilical artery RI in IUGR and control groups

RI / Study Group	Mean	S.D ±	Range		Test of significance versus control	
			Min.	Max.	t	P
IUGR** (n= 18)	0.687	0.18	0.752	0.854	3.8720	< 0.01*
Control (n= 50)	0.578	0.05	0.494	0.661		

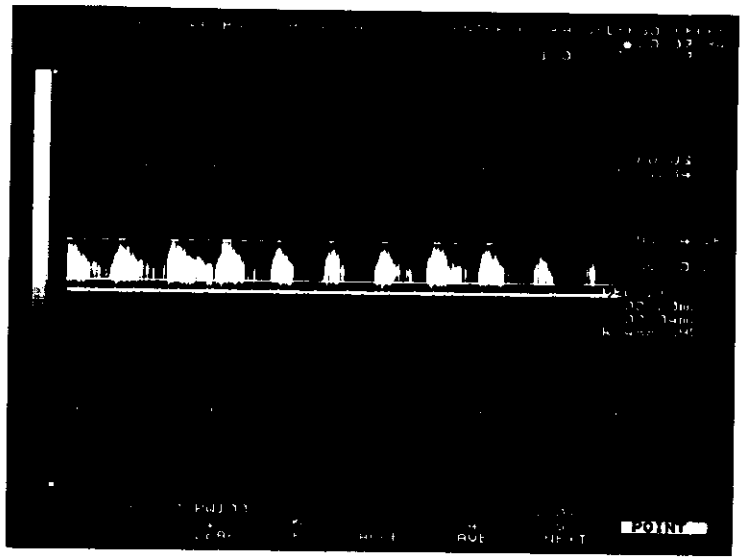
* = Significant
** 7 cases with absent flow are excluded from statistical study



Normal umbilical artery blood velocity waveform with systolic diastolic ratio of 2.7



Abnormal umbilical artery blood velocity waveform with systolic diastolic ratio of 4.0



Abnormal umbilical artery blood velocity waveform with absent diastolic flow.