RESULTS

The study included 90 parturients. Seventy eight babies did not have RDS (G_1),while twelve babies had RDS (G_2). Comparison of the clinical criteria of both groups (Table 1) shows no significant differences except in gestational age (39.6 ± 1.7 VS 31.9 ± 2.9 weeks, P<0.001) and fundal level (36.9± 1.8 VS 31 ± 3.0 weeks, P<0.001) in G_1 and G_2, respectively.

Mean BPD was significantly longer in G_1 than in G_2 (9 ± 0.25 VS 7.9 ± 0.7 cm, P< 0.001). Mean FL was significantly longer in G_1 than G_2 (7.9 ± 0.3 VS 6.3 ± 0.6 cm , P< 0.001). Also, DFE was significantly larger in G_1 than G_2 (5.3 ± 1.2 VS 3.7 ± 1.1 cm , P<0.001) as shown in ***Table 2***. Proximal humoral epiphysis was present in 51 fetuses (65%) in G1 compared to none in G2. The difference was statistically significant (P<0.001).

The lung/liver ratio ***(Table 3)*** showed no single case of RDS with hyperdense cases ***(Fig.1)*** while all the hypodense cases (4 cases) showed RDS. The difference was statistically significant (P< 0.001). Fetal bowel showed significantly higher incidence of mature patterns (III and IV) in G_1 than G_2 (97 % VS 66%, P<0.001) as shown in table (4).Stage III and IV had less than 10% incidence of RDS ***(Fig. 2)*** .

Placental grading showed a significantly higher incidence of mature patterns in G_1 than G_2 (P<0.001) as shown in ***(Table 5)***. Correlation of placental grade with gestational age among the whole population studied is shown in ***(Table 6)***. Furthermore, the association between placental grade and gestational age was found to be statistically significant (r=0.41; P<0.00). ***Table (7)*** shows the mean gestational age at different placental

grades. In patients with grade III placenta, gestational age ranged from 38-42 weeks with a mean of 39 ± 0.8. Grade III placenta had no RDS ***(Fig.3)***.

Amniotic fluid was turbid in 81% of G_1 cases compared to 58% of G_2 cases. The difference was statistically significant ($P<0.05$).

Using the ultrasonic fetal lung maturity score as stated in ***Table III***, G_1 had a signficantly higher total score than G_2 (9.7 ± 2.3 VS 3.7 ± 2.2, $P < 0.001$) as shown in ***(Table 8)***.

Tables (9 &10) show the accuracy of the ultrasonic parameters, individually, in detection of fetal lung maturity compared to total score which shows the highest accuracy (88.9%). ***Fig. (4)*** shows the relation between ultrasonic fetal lung maturity score and incidence of RDS. Total score of 8 or more shows no RDS. The incidence of RDS is increased with lowering the total score reaching 100% with scores below 4.

Table (1): ***Clinical criteria of no RDS group (G1) and RDS group (G2)***

Group / Clinical criteria	G1 (n=78) Mean ± SD (Range)	G2 (n=12) Means ± SD (Range)	t	p
Age (years)	27.6 ± 7.2 (17-47)	27.3 ± 6.9 (16-45)	0.16	> 0.05
Gest age (Weeks)	39.6 ± 1.7 (35-42)	31.9 ± 2.9 (28-36)	9.018	< 0.001
Parity	1.9 ± 1.8 (1-12)	2.2 ± 1.9 (1.13)	0.417	> 0.05
Gravidity	2.9 ± 2.5 (1-14)	3.7 ± 2.7 (1-14)	0.984	> 0.05
Wt (Kg)	83.7± 10.5 (58-107)	83 ± 9.1 (57-107)	0.236	> 0.05
Pulse (/min)	80.9 ± 5.0 (68-95)	80.6 ± 4.6 (68-100)	0.261	> 0.05
Syst Bp (mmHg)	117.7± 8.1 (100-140)	118.3 ± 7.2 (100-140)	0.339	> 0.05
Diast Bp (mmHg)	74.4 ± 7.8 (60-90)	73.3 ± 9.8 (60-90)	0.344	> 0.05
Fundal level (weeks)	36.9 ± 1.8 (28-40)	31 ± 3.0 (27-36)	6.69	< 0.001

Table (2) : ***Comparison of BPD, FL, DFE between no RDS group (G1) and RDS group (G2)***

Group / Songraphic criteria	G1 (n=78) Mean ± SD (Range)	G2 (n=12) Means ± SD (Range)	t	p
BPD ✦ cm	9.0 ± 0.25 (8.7-9.2)	7.9 ± 0.67 (7-8.7)	5.03	< 0.001
FL * cm	7.4 ± 0.3 (7.2-7.7)	6.3 ± 0.6 (5.5-7.1)	6.7	< 0.001
DFE ⊙mm	5.3 ± 1.2 (3-7)	3.7 ± 1.1 (2-5)	4.5	< 0.001

✦ **Biparietal diameter**

* **Femur length**

⊙ **Distal femoral epiphysis**

Table (3) : ***The lung /liver ratio in no RDS group (G1) and RDS group (G2)***

Group	Lung/Liver ratio		
	Hypo dense	Iso dense	Hyper dense
G1 n (%)	0 (0)	13 (61.9)	65 (100)
G2 n (%)	4 (100)	8 (38.1)	0 (0)

X	P
47.14	< 0.001

Hypodense : **The echogenicity of the lung is less than that of fetal liver**

Isodense : **The echogenicity of the lung is the same of that of fetal liver**

Hyperdense : The echogenicity of the lung is greater than that of fetal liver.

(Morris, 1984)

Table (4) : ***Comparison of the pattern of fetal bowel between no RDS group (G1) and RDS group (G2)***

Group	Fetal bowel pattern		
	I & II	III	IV
G1 n (%)	2 (33.3)	42 (89.4)	34 (91.9)
G2 n (%)	4 (66.4)	5 (10.6)	3 (8.1)

X	P
20.5	< 0.001

Fetal bowel pattern

Stage I : **The intestine has a uniform grey appearance**

Stage II : **Colonic small echo free areas**

Stage III : **Colonic delineated large segments with intestinal clusters of numorous echo free areas**

Stage IV : **Colonic redundant haustra and larger echo free areas with active peristalsis .**

(Zilianti and Fernandez, 1983)

Table (5) ***:Comparison of placental grading in no RDS group (G1) and RDS group (G2)***

Placental grading / Group	Placental grading			
	0	I	II	III
G1 n (%)	2 (50)	12 (80)	50 (87.7)	14 (100)
G2 n (%)	2 (50)	3 (20)	7 (12.3)	0 (0)

X	P
10.19	< 0.001

Grade 0 : Homogenous smooth chorionic plate .

Grade I : Undulated chorionic plate with scattered calcifications .

Grade II : Incompelet straight line of calcification not reaching the basal plate .

Grade IV : Indentation and calcification of chorionic plate reaching basal plate.

(Grannum and associates., 1979)

Table (6) : Correlation of placental grade with gestational age among the studied population .

Placental grade	No. of patients	Gestational age (Weeks)	
		28 - 36	≥ 37
0	4	3 (75 %)	(1) 25 %
I	15	10 (66.7)	5 (33.3%)
II	57	25 (43.9 %)	32 (56.1%)
III	14	0 (0%)	14 (100 %)
Total	90	38 (42.2 %)	52 (57.8 %)

r = 0.41

P < 0.05

Table (7): Mean gestational age at different placental grades .

Placental grade	Gestational age (Weeks) Mean ± SD (Range)
0	34.8 ±2.83 (28-37)
I	35.0± 2.68 (28 - 38)
II	36.0 ±2.14 (32 - 40)
III	39 0.8 (38 - 42)

Table (8) : ***Comparison of total lung maturity score in no RDS group (G1) and RDS group (G2)***

Group	G1 (n = 78)	G2 (n = 12)	t	p
	Mean ± SD (Range)	Mean ± SD (Range)		
Total Score	9.7 ± 2.34 (4-13)	3.7 ± 2.2 (1-7)	8.85	< 0.001

Table (9): ***Validity of ultrasonic parameters and total score in prediction of fetal lung maturity (n = 90) .***

	True positive n	True negative n	False positive n	False negative n
A.F.F.	5	63	15	7
D.F.E	9	61	17	3
P.H.E.	12	51	27	0
B.P.D.	11	60	18	1
F.L.	8	62	16	4
Total score(≥7)	11	69	9	1

A.F.F. = Amniotic fluid fleckers

D.F.E = Distal femoral epiphysis

P.H.E = Proximal humoral epiphysis

B.P.D = Biparietal diameter

F.L = Femur length

Table (10): ***Accuracy of ultrasonic parameters in prediction of fetal lung maturity***

	Sensitivty	Specificity	Positive predictive value	negative predictive value	Accuracy
A.F.F.	41.6%	80.7%	25%	90%	75.5%
D.F.E	75%	78.2%	34.6%	95%	77.7%
P.H.E.	100%	65.4%	30%	100%	78.8%
B.P.D.	91.6%	76.9%	37.9%	98.3%	78.8%
F.L.	66.7%	79.5%	33.3%	93.9%	77.8%
Total score (≥7)	88.5%	91.7%	55%	98%	88.9%

A.F.F. = Amniotic fluid fleckers

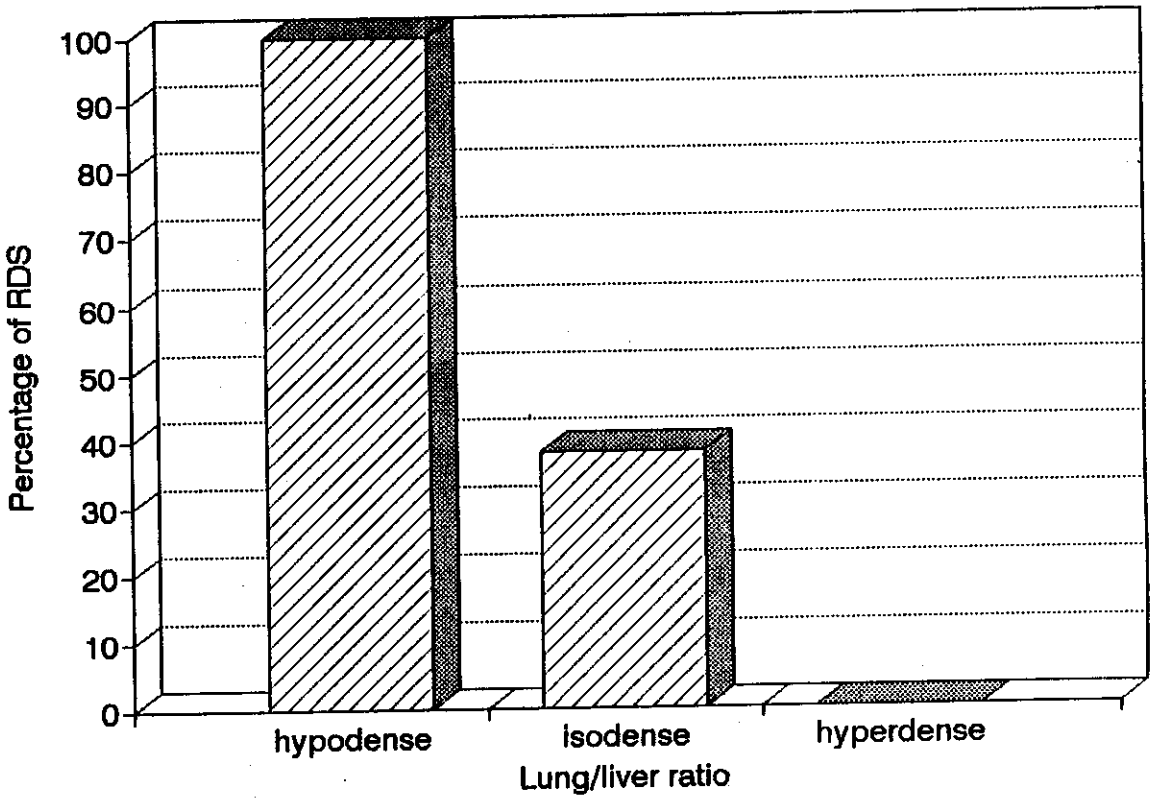
D.F.E. = Distal femoral epiphysis

P.H.E = Proximal humoral epiphysis

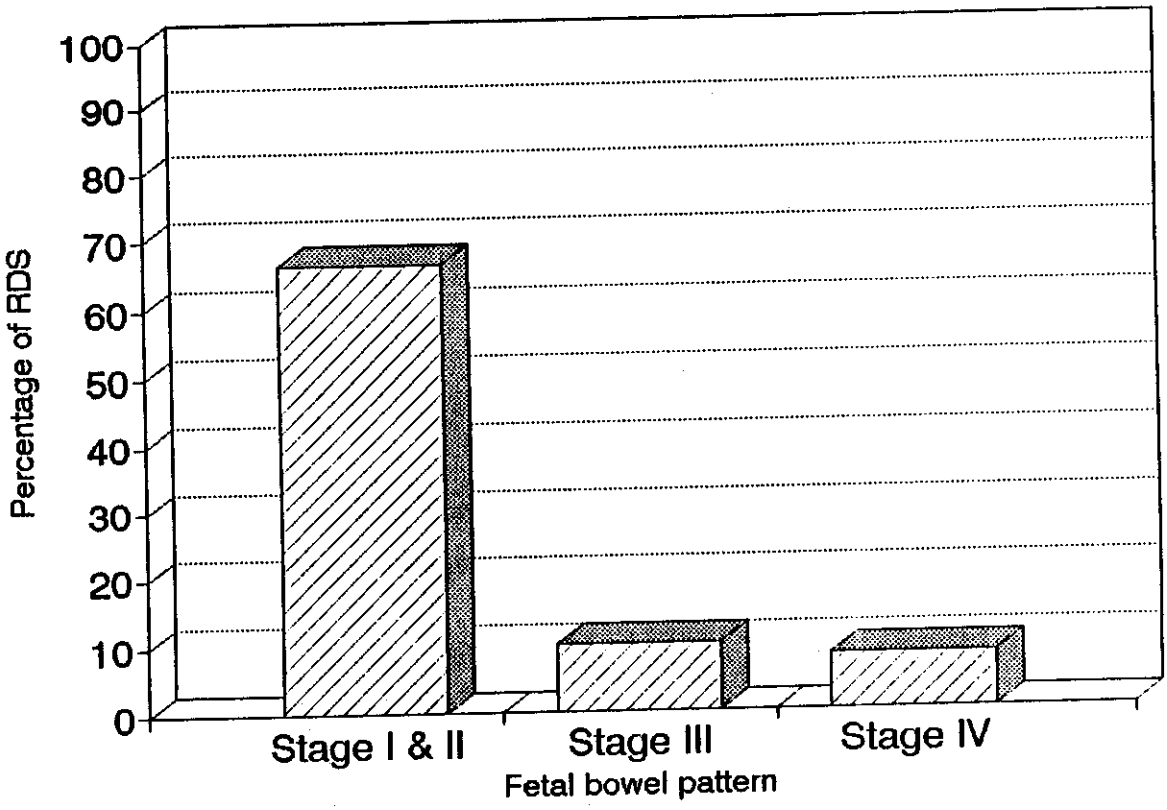
B.P.D. = Biparietal diameter

F.L = Femur length

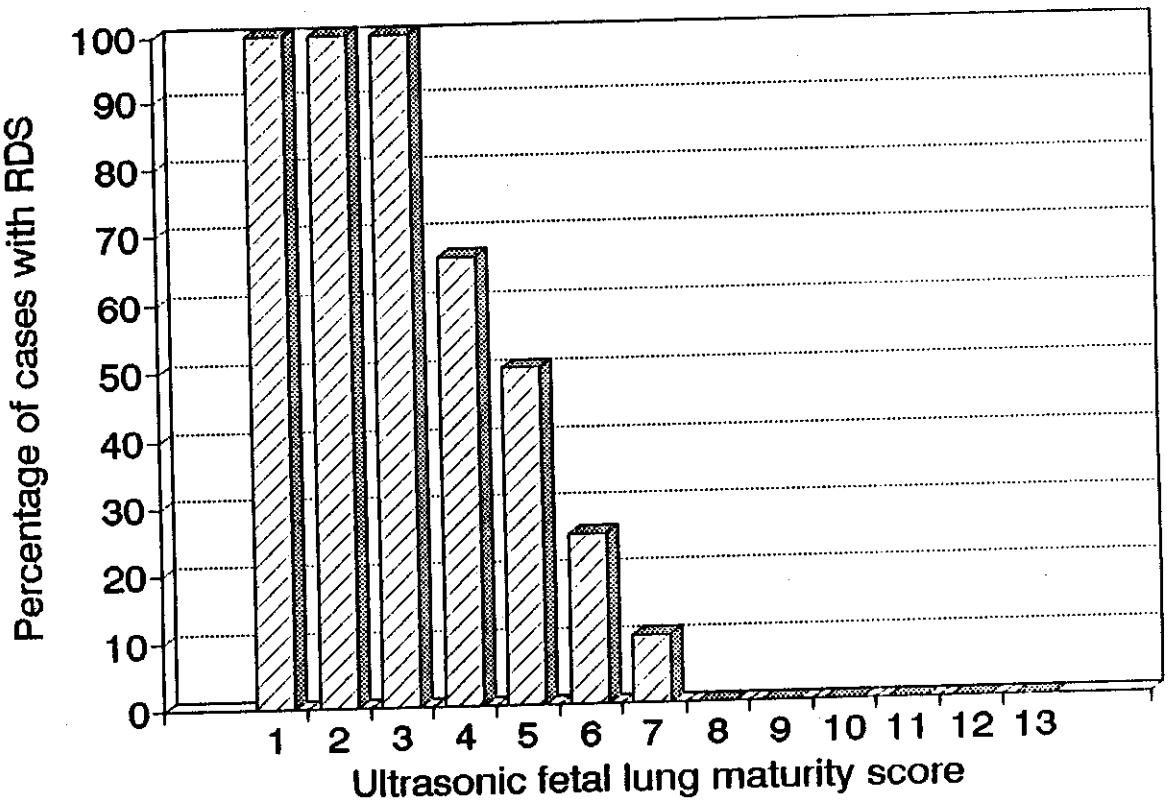
Fig(1): Percentage of RDS with use of lung/liver ratio



Fig(2): Percentage of RDS with use of fetal bowel pattern



Fig(4):The incidence of RDS in relation to ultrasonic fetal lung maturity score



Fig(3): Percentage of RDS with use of placental grading