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Prolactin and its correlation with gestational age and birth weight in a new-born

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Abstract
Prolactin is analogous in certain respects to growth hormone and its role in growth and development of the fetus in utero is steadily emerging. It can serve as a predictor of fetal maturity in utero. Our objective was to study the correlation between Serum Cord Prolactin levels with birth weight and gestational age in antenatal cases. It was a prospective study enrolling 280 eligible pregnant women presenting to the labour room in a tertiary hospital. Umbilical cord serum prolactin was assayed by Chemiluminescent Micro particle Immunoassay and was correlated with gestational age and birth weight of the neonate. 76.1% were term neonates. 49.3% were born to mothers with high risk pregnancies. Mean serum prolactin was higher in neonates of <28 weeks (686 ng/ml) but was almost similar from 28 weeks to term with p value of 0.537. Mean serum prolactin was 493.70 ng/ml for low birth weight neonates and p value was 0.754. There was no statistically significant correlation between prolactin with birth weight and gestational age in our study but can open an arena for research in the future.

Keywords: Cord prolactin, gestational age, intrauterine growth, high risk pregnancy

Introduction
Prolactin and Growth hormone are both anterior pituitary hormones that are almost identical in structure and is responsible for cell proliferation and growth [1]. Prolactin levels in the fetus gradually increases during pregnancy [2]. Prior to birth, human Growth hormone variant and Human Placental Lactogen along with Prolactin and Insulin like growth factor IGF 1 is responsible for the growth and development of the fetus [1]. In normal pregnancy, the rise of maternal prolactin occurs gradually from 10-20 ng/ml (pre pregnancy level) to 200-400 ng/ml at term [3]. Some studies have suggested that increasing plasma estrogen levels with increasing gestational age stimulates prolactin secretion and sensitizes the lactotrophs. In a study conducted by Beeston *et al*, they concluded that SGA fetus had higher prolactin levels. They hypothesized that it may be due to the absence of negative feedback on HPA (Hypothalamo-pituitary axis) or a consequence of hypoglycemia [4]. Hence this study was conducted to find a correlation between serum prolactin and birth weight and gestational age in antenatal cases.

Materials and Methods
280 eligible antenatal patients were considered for this hospital based prospective study. 3 ml of fetal umbilical cord blood was collected soon after delivery of the baby and cord serum Prolactin levels assayed by Chemiluminescent Micro particle Immunoassay Method (CMIA). Details with antenatal history, intrapartum and postpartum details were collected and entered in an excel spread sheet. SPSS (Statistical Package for Social Sciences) version 20 was used to perform the statistical analysis. Descriptive statistics of the explanatory and outcome variables were calculated by mean, standard deviation for quantitative variables, frequency and proportions for qualitative variables. ANOVA test was applied to test the statistical significance for more than two groups for quantitative data. Pearson's correlation was calculated and scatter plots were drawn to calculate the correlation between serum prolactin, birth weight and gestational age. The level of significance was set at 5%.

Results
Our study involved 280 neonates of which 76.1% were born at term, 21.4% born between 32 – 37 weeks, 1.1% born between 28-32 weeks and 1.4% before 28 weeks (Table 1). High risk pregnancy constituted 49% of our study demographic.

Of the 280 neonates, 47.9% were females and 52.1% males. The birth weight of 16 neonates (5.7%) were between 1.5-2 kg, 46 neonates had a birth weight of 2-2.5kg (16.4%), 204 of 280 (72.8%) neonates had birth weight of 2.5-3.5 kg and 14 of 280 (5%) neonates had birth weight >3.5kg (Table 2). Mean serum prolactin was 686 ng/mL for <28 weeks of gestational age, 508 ng/mL for 28-32 weeks, 513.35 ng/mL for 32-37 weeks and 510.46 ng/mL for >37 weeks with a p value of 0.537 which was not statistically significant (Table 3) Mean serum prolactin was 569.75 ng/mL for birth weight 1.5-2 kg, 457.48 ng/mL for birth weight 2-2.5 kg, 522.06ng/mL for birth weight of 2.5-3.5 kg and 518.29ng/mL for birth weight >3.5 kg with a p value of 0.286 (Table 4) Pearsons correlation was done between Serum prolactin with gestational age and birth weight with a p value of 0.197 and 0.439 respectively (Table 5). Figure 1 shows a positive correlation between Serum Prolactin and Gestational age. Figure 2 also shows a positive correlation between Serum Prolactin and birth weight.

Table 1: Distribution of neonates based on gestational age at birth

Gestational age (weeks)	Frequency	Percent (%)
< 28	4	1.4
28-32	3	1.1
32-37	60	21.4
> 37	213	76.1
Total	280	100

Table 2: Distribution of neonates based on birth weight

Birth weight (kg)	Frequency	Percent (%)
1.5-2	16	5.7
2-2.5	46	16.4
2.5-3.5	204	72.8
> 3.5	14	5.0
Total	280	100.0

Table 3: Comparison of Serum Prolactin with Gestational age (ANOVA)

Gestational age (weeks)	N	Serum Prolactin (ng/mL)		F value	p value*
		Mean	Std. Dev		
< 28	4	686.00	421.944	0.727	0.537
28-32	3	508.00	115.879		
32-37	60	515.35	227.428		
> 37	213	510.46	235.315		
Total	280	513.99	235.497		

Table 4: Comparison of Serum Prolactin with birth weight (ANOVA)

Birth weight (kg)	N	Serum Prolactin (ng/mL)		F value	p value*
		Mean	Std. Dev		
1.5-2	16	569.75	303.422	1.267	0.286
2-2.5	46	457.48	264.573		
2.51-3.5	204	522.06	220.082		
> 3.5	14	518.29	263.025		
Total	280	513.99	235.497		

Table 5: Correlation between Serum Prolactin with Gestational age and Birth weight

Pearson Correlation	Gestational age	Birth weight
r value	0.077	0.046
p value	0.197	0.439

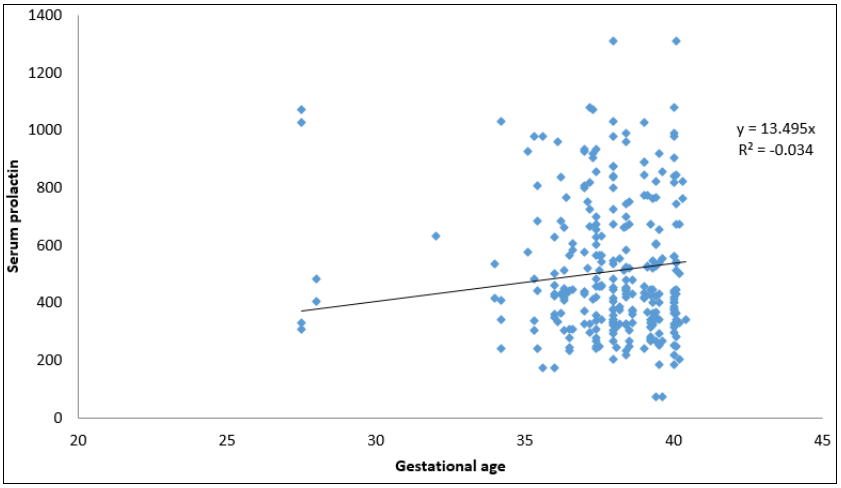

Fig 1: Scatter diagram showing correlation of Serum Prolactin with Gestational age

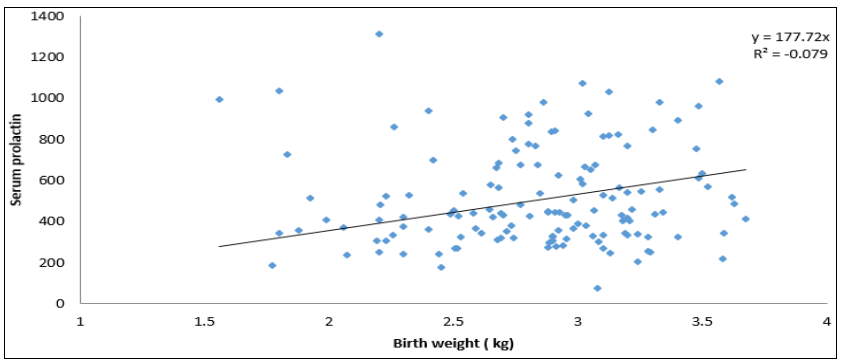

Fig 2: Scatter diagram showing correlation of Serum Prolactin with Birth weight

Discussion

Our study aimed to find a correlation between cord serum Prolactin with birth weight and gestational age. Serum prolactin does seem to increase with increase in gestational age and similar increase is noted with birth weight. In a study by Gluckman *et al.* [5] 77 new-born infants born between 28 to 40 weeks was considered and serum prolactin was positively correlating with gestational age. In another study by Vidya Gaikwad *et al.* [6] showed increasing serum prolactin levels with increasing gestational age irrespective of the pregnancy risks. Namrata V. Padvi *et al.* [7] concluded in their study that serum prolactin was directly proportional to birth weight.

Conclusion

In conclusion, it has been observed that our study shows that maternal serum prolactin levels have a positive correlation with both neonatal birth weight and gestational age. This may prove the hypothesis that Prolactin levels in the fetus mimic the actions of Growth Hormone and higher levels are associated with a subsequent increase in birth weight. Serum Prolactin is shown to be directly proportional to the gestational age and may even have a role in fetal lung maturation and neonatal outcomes which has now opened up further avenues of research.

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Conflict of Interest

Not available

Financial Support

Not available

References

1. Daliot J, Laron-Kenet T, Wattad M, Ben-Dor A, Lilos P, Laron Z. The relationship between serum levels of prolactin and growth hormone in the early postnatal period. Pediatric Research. 2017;82(5):796-800.
2. Root AW. Growth hormone and prolactin in the fetus. Prog. Clin. Biol. Res. 1976;10:107-126.
3. Dayal M, Malhotra K, Mukherjee K, Verma M. Fetal cord prolactin in normal and abnormal pregnancies. J Obstet Gynecol India. 2001;51:86-9.
4. Thorpe-Beeston Jguy, Snijders Rosalindej, Felton Carlv, Nicolaides Kyprosh. Serum prolactin concentration in normal and small for gestational age fetuses. BJOG: An International Journal of Obstetrics and Gynaecology. 1992;99(12):981-4.
5. Gluckman PD, Ballard PL, Kaplan SL, Liggins GC, Grumbach MM. Prolactin in umbilical cord blood and the respiratory distress syndrome. The Journal of Pediatrics. 1978;93(6):1011-4.
6. Gaikwad V, Deshpande H, Pharande P. Fetal cord serum prolactin (PRL) levels in normal and abnormal pregnancies and its relation to development of RDs. Int J Clin Obstet Gynaecol. 2018;2(1):85-88.
7. Padvi NV, Narkhede HR, Pawar AP, Mhatre PN. Prolactin level in umbilical cord blood of newborn and its relation to respiratory distress syndrome. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2017;6(2):433.

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