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A CORRELATIVE STUDY OF MATERNAL WEIGHT GAIN AND HAEMOGLOBIN LEVEL WITH BIRTH WEIGHT OF NEW BORNS

KEYWORDS: Pregnancy, anaemia. Maternal weight gain, haemoglobin

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ABSTRACT *Pregnancy is a prominent event in a women's life, able to transform her life forever. The present study was carried out on 215 pregnant women in the last trimester, selected from Government Hospitals of Nagpur city. The information on socio-demographic characteristics and weight gain was collected through interview cum questionnaire method. Haemoglobin level and birth weight of newborns were noted from hospital records. The results of the study reveal that with an increase in mean weight gain and haemoglobin level of mothers, there is subsequent increase in birth weight of neonates. The neonatal birth weight was found to be positively and significantly correlated with maternal weight gain(r= 0.427, p<0.01) and maternal haemoglobin (r= 0.530, p<0.01).*

Introduction_

Maternal health is considered as the most important regulators of human foetus growth. Gestational weight gain during pregnancy influence infant birth weight. A strong relationship between maternal pregnancy weight gain and birth weight has been consistently demonstrated, and low maternal weight gain is considered a preventable risk factor for LBW (Tabrizi and Saraswathi, 2012). Anaemia is the most wide spread disorder in the world, affecting 30% of the global population, and is even more prevalent among pregnant women. Anaemia in pregnancy is a common problem and 50% pregnant women in developing countries are suffering from anaemia; 20 % of the maternal deaths are directly or indirectly related to anaemia. According to WHO criteria, haemoglobin concentration of less than 11 g/dl is declared as anaemia in pregnancy. Anaemia is a critical health concern because it affects growth and development of neonates. Prevalence of anaemia in developing countries is 56% it is even higher in the Central Asia, reported as being 80% in India (Ahmad *et al*, 2011). Hence, the present study was aimed to compute the correlation of maternal weight gain and haemoglobin concentration with birth weight of new born.

Materials and Methods

For the present study, 215 pregnant women in their last trimester of pregnancy government hospitals of Nagpur city were selected through purposive sampling method. Information was collected by direct interviewing method through a structured questionnaire. Hospital records were also referred. The questionnaire for this study consisted of socio-demographic profile, weight gain, haemoglobin concentration of mothers and birth weight of new born. Data was analyzed using means, standard deviations, percentages and range values. Correlation Coefficient were computed using Pearson's Product moment formula.

Results and Discussion

Socio-demographic Profile: A majority pregnant women (55.35%) were in the age group of 20-25 years. The mean age of women was found to be 24.43 ± 3.24 years. The mean age of marriage of pregnant women was found to be 21.04 ± 2.26 years and about 40.47% belonged to nuclear family. 58.14 % and 17.21 % pregnant women had education up to SSC and HSSC respectively. The mean monthly per capita income of pregnant women was Rs. 678.60 ± 554.25.

Maternal Gain in Weight and Birth Weight of New Born

The maternal gain in weight in relation to birth weight of new-born has been presented in Table I.

Table I: Maternal Gain in Weight in Relation to Birth Weight of Newborns

S.N.	Maternal Gain in Weight (Kg)	Number of cases	Birth weight (Kg) Mean ± SD	Correlation Coefficient
1	< 6	29	2.31 ± 0.34	0.427**
2	6-9	95	2.40 ± 0.41	
3	9-12	79	2.62 ± 0.37	
4	> = 12	12	3.15 ± 0.33	
	Total	215	2.51 ± 0.43	

** p < (0.01)

Table I reveals the highest mean birth weight of babies mothers who gained more than 12 kg weight during pregnancy (3.15 ± 0.33). The lowest mean birth weight was observed in the group of mothers who gained less than 6 kg weight during pregnancy (2.31 ± 0.34). Results also showed that the mothers gaining weight less than 6 kg during pregnancy had more chances of delivering a low birth weight babies. With an increase in weight gain during pregnancy, there was a corresponding increase in mean birth weight of newborns. The gain in weight during pregnancy and mean birth weight of babies showed a positive and significant correlation (r = 0.427, p < 0.01). Suchdeva *et al.* (2009) also reported that with an increase in maternal weight gain (the last trimester) weight of the new-born also increases.

Maternal Haemoglobin Status

The haemoglobin status of mothers during pregnancy has been presented in Table II.

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Table II: Haemoglobin Status of Pregnant Women

Sr. No.	Cut -Off value for Haemoglobin by WHO(g/dl)	Degree of Anaemia	Number of Cases N=215	Haemoglobin levels Mean ± SD
1	11 and Above	Non-anaemic	14 (6.51)	11.65 ± 0.54
2	10.0 - 10.9	Mild anaemia	48 (22.33)	10.18 ± 0.23
3	7.0 - 9.9	Moderate anaemia	151 (70.23)	9.21 ± 0.43
4	Below 7.0	Severe anaemia	2 (0.93)	6.40 ± 0.00
	Mean ± SD			9.55 ± 0.84

(The number in parenthesis indicates per cent cases)

Table II shows that a majority of mothers (70.23%) had mean haemoglobin of 9.21 ± 0.43 gm/dl and were classified as moderately anaemic. Only 6.51% mothers were normal and 0.93% was suffering from severe anaemia. Data also shows that 22.33% and 70.23% mothers had mild and moderate anaemia having mean haemoglobin of 10.18 ± 0.23 and 9.21± 0.43gm/dl respectively. The overall mean haemoglobin level of mothers was found to be 9.55 ± 0.84 gm/dl.

The prevalence of anaemia among the pregnant mothers has also been reported by several workers. Suchdeva *et al.* (2009) observed the mean haemoglobin level as 9.3 ± 0.6 and 9.8 ± 1.01 and 9.5 ± 0.7 and 10.0 ± 0.9 g/dl in Group I and II during 7th and 9th months, respectively. Telatar *et al.* (2009) reported that out of 3688 pregnant women, 1588 (43%) were anaemic and among the anaemic mothers, 1245 had mild (78.5%), 311 had moderate (19.5%) and 32 (2%) had severe anemia.

Haemoglobin Status of Mothers and Birth Weight of Neonates

In the present investigation an attempt was made to study the mean birth weights of babies with different categories of mothers' haemoglobin levels. The mean haemoglobin levels of pregnant women and mean birth weight levels of newborns have been presented in Table III.

Table III: Haemoglobin status of Pregnant Women in Relation to Birth Weight of Newborns

Cut -Off value for haemoglobin by WHO (g/dl)	No	Mean haemoglobin levels of pregnant women (g/dl) Mean ± SD	Mean birth weight of newborns (kg) Mean ± SD	Correlation Co-efficient
> = 11.0 Non-anaemia	14	11.65 ± 0.54	3.16 ± 0.29	0.530**
10.0 - 10.9 Mild-anaemia	48	10.18± 0.23	2.66 ± 0.36	
7.0 - 9.9 Moderate anaemia	151	9.21 ± 0.43	2.41 ± 0.39	
Below 7.0 Severe anaemia	02	6.40 ± 0.00	2.35 ± 0.07	
Total	215	9.55 ± 0.84	2.51 ± 0.43	

**p<0.01

Table III shows that mothers with normal haemoglobin level (11g/dl and above) had highest mean birth weight of babies i.e., 3.16 Kg. Mothers having mild, moderate and severe anemia showed correspondingly lower mean birth weights of babies. The mean birth weight of neonates of mildly, moderately and severely anaemic mothers was 2.66 ± 0.36 kg, 2.40 ± 0.39 kg and 2.35 ± 0.07 kg respectively. The correlation coefficient between haemoglobin level of mothers and birth weight was positive and significant ($r = 0.530$, $p < 0.01$). With an increasing maternal haemoglobin level, subsequent increase in babies' weight was observed. The data shows a typical trend that with an increase in haemoglobin levels of mothers there is subsequent increase in birth weight of infants also.

Paul and Purushothman (2002) also stated that as the degree of anaemia increased, the weight of the neonate was found to be decreasing and low birth weight babies (<2.5kg) were delivered by both moderately and severely anaemic mothers. Varma et al. (2008) observed that increasing trend in birth weight of infants was noted with an increase in maternal haemoglobin levels. Subjects with haemoglobin levels of 8.1 to 10 g/dl delivered babies with average birth weight that ranged between 2.55 to 2.60 kg. Subjects with mean haemoglobin levels above the cut off level of 11 g/dl delivered babies with average birth weights ranging between 2.97 to 3.11 kg.

CONCLUSION

The results of the study revealed that with an increase in mean weight gain and haemoglobin level of mothers, there is subsequent increase in birth weight of neonates. Thus the results conclusively show that mothers weight gain and haemoglobin status with neonatal birth weight has positive and significant correlation.

REFERENCE

1. Tabrizi Fatemeh Moghaddam and G Saraswathi., (2012); Maternal anthropometric measurements and other factors: relation with birth weight of neonates, Nutrition Research and Practice;6(2); 132-137. | 2. Ahmed, M., Kalsoom, U., Sughaghra, U., Hadi U., Imran, M., (2011); Effect of Maternal Anaemia on Birth Weight. J Ayub Med Coll Abbottabad 23(1). | 3. Suchdeva, R., Kaur,P., Kochhar, A. and Chawla, P. (2009) 'Impact of iron status of pregnant women on the anthropometry of newborns in industrial and non-industrial areas'. Anthropologist, 11 (3): 219-224. | 4. Telatar, B., Comert, S., Vitrinel, A., Erginoz, E., and Akin Y. (2009) 'The effect of maternal anemia on anthropometric measurements of newborns'. Saudi Med J. 30 (3): 409-412. | 5. Paul, M. and Purushothaman, V. (2002 b) 'Birth weight in relation to the iron status of pregnant women'. Ind. J. Nutr. Dietet, 39 (8): 355-360. | 6. Varma, T., Nande, P. and Vali S. A., (2008) 'Birth weight of newborn in relation to maternal weight gain and haemoglobin level'. Ind. J. Nutr. Dietet 45 (2) : 63-68. |