Effect of Anemia on Pregnancy outcome: A Case-control study

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Abstract— *Anemia in pregnancy is commonly considered as risk factor for poor pregnancy outcome and can threaten the maternal and fetal life also. So this present cases control study was carried at R. K. Joshi District Hospital Dausa (Rajasthan) India, with the aim to find out the effect of anemia in Antenatal period on pregnancy outcomes. For this study, 50 Antenatal Cases (ANCs) with anemia were selected as study group among ANCs attending for delivery in district hospital Dausa. For control group age and BMI matched 50 normal healthy ANCs without anemia were selected from the same area. ANCs with any other diseases were excluded from the study. It was found in this study that although proportion of ANCs with LSCS, PPH and Sepsis were higher in anemic ANCs but it was not found significant. Likewise IUGR, LBW babies, premature births and still births were more in anemic ANCs but it was found significant only in case of LBW babies. So it can be concluded that anemia in ANCs effect weight of newborn babies born by ANC with anemia.*

Keywords: Antenatal Cases (ANCs), Anemia in pregnancy, Pregnancy outcomes IUGR , LBW babies

I.   INTRODUCTION

Anemia is one of the most commonly encountered medical disorders during pregnancy. CDC defines anemia when hemoglobuline is below 11gm/dl of blood. Anemia in pregnancy is commonly considered as risk factor for poor pregnancy outcome and can threaten the maternal and fetal life also. WHO has estimated that Prevalence of anemia in pregnant women in developed countries is 14 % and in developing countries is 51%.[1].

In India, prevalence ranges from 33% to 89%. ICMR district nutrition survey 1999-2000 also reported prevalence of anemia as 84.2% with 13.1% with severe anemia in pregnancy.[2]   Anemia is associated with 22% maternal deaths around the world [2].India contributes to about 80% of maternal deaths due to anemia in south Asia.[3] In India anemia is second most common cause of maternal death, accounting for 20% of the total maternal death.[4]

Iron deficiency is principal cause of anemia.[5] Only 22.3% pregnant women consumed Iron and folic acid tablets for 100 days. (NFHS 2005-06). National Nutrition Monitoring Bureau (NNMB-2003) and RCH surveys have shown that coverage under IFA supplementation was low and even among those who received the tablets, only one-third of them were regularly taking.[6]

Pregnancy related complications affect mainly the women and infant with unfavorable health conditions and lower socioeconomic status. Maternal mortality rates are higher in women with Hb below 8gm/dl. Premature births are more common in women with moderate anemia. Infection, maternal deaths due ante partum and post-partum hemorrhage, pregnancy induced hypertension and sepsis occur in women with moderate anemia. Severe Anemia leads to cardiac decomposition when Hb falls below 5.0 g/dl.

Anemia during pregnancy is associated with IUGR, low birth weight, preterm delivery, increased perinatal mortality, lowered childhood intellectual ability[7] neonatal anemia due to poor reserve. Infants with anemia have higher prevalence of failure to thrive, poorer intellectual developmental milestones, and higher rates of morbidities and neonatal, mortalities than infants without anemia.

Various studies have been conducted worldwide and in our country to find out most efficacious drug for induction of labor but results are inconsistent and non uniform. But there is lacking in such studies in Rajasthan.

Therefore, this present study was conducted in a district hospital of a district in Rajasthan.

II.   METHODOLOGY

This hospital based case-control analytic type of observational study was carried out on 50 ANCs with anemia and age & body mass index matched 50 healthy ANCs.

For study group, primigravida ANCs with anemia were selected from the ANCs attending at R. K. Joshi District Hospital, Dausa (raj) India, for delivery. And for control group, age & body mass index matched healthy primigravida ANCs were identified from ANCs attending for delivery at the same hospital. ANCs having any other disease and or multitone pregnancy were excluded from this study. ANCs who was discharged before 48 hrs of delivery were also excluded from study. Procedure was repeated till 50 primigravida ANCs with anemia were selected for study group and 50 age & body mass index matched healthy primigravida ANCs were selected for control group.

Both the groups of ANCs were interrogated and data regarding their age, residence, weight and height was noted. Body Mass Index (BMI) of each ANC was calculated as below

$$BMI=Weight/Height^2$$

Then these ANCs were followed till the delivery and after 48 hrs of delivery. Results of pregnancy were examined thoroughly and were noted.

Data regarding maternal outcome of pregnancy like type of delivery, post-partum hemorrhage (PPH) and sepsis were also observed and noted.

Data regarding newborn outcome of pregnancy like Intra Uterine Growth Retardation (IUGR), premature birth and still births were also noted. Newborn born, by each ANC under study, was weighted and noted.

Data thus collected were entered in MS Excel 2010 worksheet in the form of master chart. Pregnancy outcome in the form of maternal and newborn outcomes of both groups were compared. Significance of difference in means was inferred with unpaired 't' test. Significance of difference in proportion was inferred with Chi-square test. Risk was assessed by Odd's ratio with 95% confidence limit (CL).

III.   RESULTS

In this present study, mean age of control group was 23.6± 3.2 years whereas of study group was slightly lower i.e. 22.3±3.8 years but this difference was not found significant. Likewise age, mean BMI of both the groups were also comparable (21.1 v/s 22.4, p=0.167). It was also found that distribution of ANCs as per residence was also found comparable (p=0.060). So both the groups were comparable on the basis of age, BMI and type of residence.(Table 1)

Table 1
Comparison of Bio-socio-demographic variables of Study and Control group

S. No.	Variables	Control Group (N=50)	Study Group (N=50)	P Value	LS
1	**Age (in years) Mean ± SD**	23.6± 3.2	22.3±3.8	0.067	NS
2	**Urban:Rural**	34:16	29:31	0.060	NS
3	**BMI**	21.1±3.5	22.4±5.6	0.167	NS

When maternal outcomes of both the groups were compared it was found that although proportion of ANCs with LSCS, PPH and Sepsis were higher in study group but it was not found significant.(Table 2)

Table 2
Comparison of Maternal Outcome in Study and Control group

S. No.	Variables	Fetal Outcome	Control Group (N=50)		Study Group (N=50)		Odd's Ratio (95% C L)	*P Value LS
			No.	%	No.	%		
1	**Delivery**	Normal	32	64	33	66	1.024 (0.456 to 2.295)	0.881 NS
		LSCS	18	36	19	38		
2	**PPH**	No	42	84	35	70	2.250 (0.854 to 5.925)	0.154 NS
		Yes	8	16	15	30		
3	**Sepsis**	Absent	49	98	44	88	6.682 (0.774 to 57.697)	0.117 NS
		Present	1	2	6	12		

*P value with Chi-square

When newborn outcomes of both the groups were compared it was found that although proportion of newborn with IUGR was higher in study group but it was not found significant. Likewise fetal growth, LBW babies, premature births and still births were more in study group but it was found significant only in case of LBW babies. (Table 3)

Table 3
Comparison of Newborn Outcome in Study and Control group

S. No.	Variables	Fetal Outcome	Control Group (N=50)		Study Group (N=50)		Odd's Ratio (95% C L)	*P Value LS
			No.	%	No.	%		
1	**Fetal Growth**	Normal	49	98	46	92	4.261 (0.459 to 39.546)	0.359 NS
		IUGR	1	2	4	8		
2	**Birth Weight**	<2.5kg	48	96	37	74	8.432 (1.791 to 39.699)	0.005 S
		>2.5 kg	2	4	13	26		
3	**Premature birth**	Absent	49	98	46	92	4.261 (0.459 to 39.546)	0.359 NS
		Present	1	2	4	8		
4	**Still birth**	No	50	100	48	96	NC	0.475 NS
		Yes	0	0	2	4		

*P value with Chi-square Test

IV. DISCUSSION

In this present study, on comparison of maternal pregnancy outcomes in ANC with and without anemia it was found that although proportion of ANCs with LSCS delivery were higher in anemic ANCs than normal ANCs (38% v/s 36%) but it was not found significant. PPH was also found more in anemic ANCs than normal ANCs (30% v/s 16%) but it was also not found significant. Sepsis was also found more in anemic ANCs than normal ANCs (12% v/s 2%) but it was also not found significant. Well comparable observations were made by Pankaj Kumar et al(2011),[8] K Jagadish Kumar (2013)[9] and Rahmann MM (2016)[10]. Anemic ANCs exhausted earlier so less chances to bear normal labor pains so

chances of LSCS are more in anemic ANCs than normal. Likewise, A relation between infection and anemia is also proposed as corticotrophin releasing hormone play a role in this.

On comparison of newborn pregnancy outcomes in ANC with and without anemia, it was found that although proportions of ANCs with IUGR in their newborn were higher in anemic ANCs than normal ANCs (8% v/s 2%) but it was not found significant.

Low birth weight (LBW) babies were found significantly more in anemic ANCs than normal ANCs (26% v/s 4%) with Odd's 8.432. Well comparable observations were made by Pankaj Kumar et al. (2011)[8] and K Jagadish Kumar (2013)[9]. Rahmann MM (2016) [10] also reported higher proportion of LBWs in anemic ANCs than the normal ANCs. This could well suggest that third trimester Hb is an important factor in determining birth weight. It is well known that rapid growth of fetus occurs in the third trimester

In this study anemia during pregnancy was not associated with premature births but However study conducted by E Ugwuja (2007-08) [11] at Nigeria reported that anemia in pregnancy was found to be significantly related with preterm deliveries in Anemia has its effect on duration of gestation. Another author Rahmann MM (2016) [10] also reported higher proportion of premature and still births in anemic ANCs than the normal ANCs. A relation between infection and anemia is also proposed as corticotrophin releasing hormone play a role in causing preterm labor.

V.   CONCLUSION

Although proportion of ANCs with LSCS, PPH and Sepsis were higher in anemic ANCs but it was not found significant. Likewise IUGR, LBW babies, premature births and still births were more in anemic ANCs but it was found significant only in case of LBW babies. So it can be concluded that anemia in ANCs effect weight of newborn babies born by ANC with anemia.

CONFLICT OF INTEREST

None declared till now.

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