

## A Clinical Study on Pancytopenia in Pregnancy in Women of Rural Haryana

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### Abstract

Pancytopenia is defined as reduction of all the three cellular elements of blood- resulting in anemia, leukopenia and thrombocytopenia. This clinical study was undertaken in a tertiary care medical college serving Gurugram district of Haryana, North India. 50 pregnant patients were found with pancytopenia, most were multigravidae, presented at term, commonest complaints being pain abdomen & leaking per vaginum, postpartum hemorrhage being the most commonly encountered complication.

**Keywords:** Aplastic Anemia, Bone Marrow, Pancytopenia, Vitamin B<sub>12</sub>

### Abbreviations

LBW: Low Birth Weight  
NTD: Neural Tube Defects  
PTB: Preterm Birth  
PTL: Preterm Labour  
PBS: Peripheral Blood Smear  
TLC: Total Leukocyte Count  
WBC: White Blood Cells

### Introduction

Pancytopenia, classically defined as reduction of all the three major cellular components of blood, results in anemia, leukopenia and thrombocytopenia [1, 2]. This entity can involve the bone marrow primarily or secondarily depending on various underlying pathologies. The various etiological factors of Pancytopenia can be aplastic anemia, infections, megaloblastic anemia, nutritional deficiencies and various malignancies [2, 3]. Vitamin B12 deficiency has been established as an important cause of pancytopenia as it has a specific role in DNA synthesis & carbon metabolism. Deficiency of Vitamin B12 is common in pregnancy owing to increased fetal demand as the pregnancy advances and its deficiency leads to defective erythropoiesis and neuronal defective myelination [1, 3, 4].

Pancytopenia in pregnancy is associated with numerous adverse maternal and fetal outcomes e.g. maternal sepsis, postpartum hemorrhage (PPH), Pre-eclampsia, Preterm labour, fetal growth retardation and Intrauterine Fetal Death among others.

Pancytopenia may vary during pregnancy due to geographical location, dietary habits and seasonal variation. It might go undetected in its early stages because of mild impairment in the bone marrow and might become apparent during periods of stress or increased demand e.g. Pregnancy, infection, bleeding, bone marrow failure syndromes and malignancies [1, 5-7]. Many non-malignant conditions e.g. infections (HIV, EBV, TB) and nutritional deficiency anemias (severe vit B12 and folic acid deficiency), might also present as pancytopenia. Tormand Rognen et al in their study proves a strong association between maternal Vit B12 deficiency and preterm birth (PTB) and low birth weight (LBW) [1, 3, 6]. Pawlak R et al have shown an association of low vit B12 concentration in first trimester of pregnancy and pre-eclampsia in the mothers and neural tube defects (NTD) & neurological impairment in the babies born to those women [1, 4-6]. Shrivastava G et al have reported severe vit-B<sub>12</sub> deficiency in pregnancy mimicking HELLP syndrome [1, 7].

Koebnick C et al proved that the prevalence of Vitamin B12 deficiency rises from second to third trimester (8 % to 35 %). Van de Velde et al suggested that severe pancytopenia caused ineffective hematopoiesis due to vitamin B<sub>12</sub> & Folate deficiency [8, 9].

### Materials & Methods

**Study type:** Hospital based, cross sectional observational study

**Study period:** 3 years

In our study, a total 50 patients were enrolled.

**Inclusion Criteria:**

All pregnant women diagnosed with pancytopenia at admission.

- Exclusion Criteria:
- Twin pregnancies
- Patients taking any medications causing pancytopenia

All these patients were followed up till their delivery with other relevant investigations and all the maternal and fetal outcomes were noted,

**Statistical Analysis:**

All the data collected were tabulated & analyzed. For continuous variables, mean +/- S.D. (standard deviation) were used for categorical data, number (n) and percentage (%) were used in data summaries and diagrammatic representations. These data were used for statistical analysis by SPSS V23.0 software and Microsoft Office 2007 [10, 11].

**Results**

Out of the total number of antenatal patients of 1550 seen during the study period of three years, 50 patients were diagnosed to have Pancytopenia (Incidence: 3.22 %).

Parity wise distribution – 32 % were prim gravida and 68 % were multigravida Mean age ~ 23.49 years (22-29 years) with S.D. ± 2.2

- All 50 patients - pancytopenia on peripheral blood smear (100 %)
- Mean Vit-B<sub>12</sub> was 150.66 pg/ml (normal range 195-950 pg/ml)
- Mean Folate level: 2.729 ng/ml (normal range 2-20 ng/ml)

The detailed results were as follows:

**Table 1: Presenting Complaint: Many Patients Had More Than One Complaint at Presentation**

Presenting complaint	Number (n)	Percentage (%)
Leaking per vaginum	35	70
Labour Pains	39	78
High BP	38	76
Preterm Labour (PTL)	36	72
Giddiness/ syncope	27	54
Fever	22	44

**Table 2: Age of the Patient**

Age	Number	Percentage (%)
<20 years	4	8.00
20-25 years	25	50.00
26-30 years	19	38.00
>31 years	2	4.00
Total	50	100.00

**Table 3: Period of Gestation at Presentation**

Gestation duration	Number (n)	Percentage (%)
28-32 weeks	12	24.00
33-36 weeks	17	34.00
37-42 weeks	21	42.00
Total	50	100.00

**Table 4: Hematological Parametres**

	Parameter	Range	Mean	S.D.
1	Hemoglobin	1.9-7.1 gm/dL	5.6	1.5
2	Platelet count	20,000-60,000/cu.mm	38269.9	13621.2
3	WBC (TLC)	2000-4170 /cu.mm	3535.6	749.9

**Table 5: Antenatal Complications: Many Patients Had More Than One Complications.**

Complication/complaint	'n'	Percentage (%)
Fever	10	20.00
Weakness / fatigue	12	24.00
Syncope / fainting	3	6.00
Labour pains	4	8.00
Leaking p/v	5	10.00
Hypertension	28	56.00
Pre-Eclampsia with HELLP syndrome	6	12.00

**Table 6: Postnatal Complications**

Parameters	'n'	Percentage (%)
Postpartum hemorrhage (PPH)	18	36.00
Puerperal pyrexia	10	20.00
Puerperal sepsis	8	16.00
Rectal Bleeding	2	4.00
Hematemesis	1	2.00
None	11	22.00
Total	50	100.00

**Table 7: Fetal Complication**

Complication	N=number	Percentage (%)
Low birth weight(LBW)	15	30.00
-Preterm	5	10.00
-FGR	10	20.00
Intrauterine death	5	10.00
Neonatal Sepsis	12	24.00
- early onset sepsis	8	16.00
- late onset sepsis	4	8.00
None	18	36.00
<b>TOTAL</b>	<b>50</b>	<b>100.00</b>

**Conclusion**

Pancytopenia in pregnancy – though a rare condition, is associated with increased risk of adverse maternal and fetal outcomes. In our study all the patients who had pancytopenia, had simultaneous folate and Vit B12 deficiency & all consumed strict vegetarian diet. Proper dietary counseling with balanced and nutritious diet plan including organic food items and supplementations of folic acid and Vitamin B 12 can prevent the development of micronutrient deficiency and consequent deleterious effect on the mother and baby due to pancytopenia.

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