



**STUDY OF VITAMIN B12 LEVELS IN MOTHERS AND INFANTS AND ITS
CORRELATION WITH GROWTH AND DEVELOPMENT OF INFANT**

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INTRODUCTION

Vitamin B12 deficiency is a major threat to public health globally.^[1,2] It plays an essential role in fetal and infant development.

The burden of vitamin B12 deficiency in India is thought to be among the highest in the world. It is found in food animal origin and cannot be synthesized in human. It is essential for normal blood and neurological function. Data on the prevalence of B12 deficiency in the Indian population is high and among pregnant and lactating mothers, the figures range from 52% to 74%.^[3] Maternal vitamin B12 deficiency has been associated with greater risk of pregnancy complications, such as spontaneous abortion, low birth weight, intrauterine growth restriction and neural tube defects.^[4] Deficiency of vitamin B12 causes megaloblastic anemia, retardation of growth and delay in neuromotor maturation.

Hence the present study is undertaken to correlate vitamin B12 level in mother and their infants and to assess the correlation of growth and development with vitamin B12 in infants.

descriptive and inferential statistics.

OBJECTIVES

1. Primary objective was to study the correlation of vitamin B12 level in mothers and their infants.
2. Secondary objective was to assess the correlation of growth and development with vitamin B12 levels in mothers and their infants.

METHODOLOGY

Hospital based longitudinal study was conducted on 100 pregnant mothers attending Navodaya Medical College & Research centre, Raichur and their newborns fulfilling selection criteria during the study.

At admission of pregnant women details were taken and systemic examination was done and recorded in a pre-designed proforma.

Blood samples were collected prior to the delivery and vitamin B12 levels recorded. After the delivery newborns fulfilling the selected criteria were enrolled after obtaining an informed consent. The blood samples were collected on second day of life to assess the vitamin B12 levels. Growth and development assessment at birth was done by anthropometry and DASII method.

The data was collected and entered into Microsoft excel spreadsheet. Collected data was analysed using

RESULTS

Table 1: Correlation of vitamin B12 levels in mother and child.

| Vitamin B12 in mother (pg/dL) | Vitamin B12 levels in child (pg/dL) | | | | | | | |
|-------------------------------|-------------------------------------|-------|-------------------|--------|-------------|-------|---------------|--------|
| | < 211 (n=29) | | 211 to 911 (n=29) | | > 911 (n=9) | | Total (n=100) | |
| | No. | % | No. | % | No. | % | No. | % |
| <211 | 24 | 40.00 | 34 | 56.67 | 2 | 3.33 | 60 | 60.00 |
| 211 to 911 | 4 | 11.43 | 27 | 77.14 | 4 | 14.43 | 35 | 100.00 |
| >911 | 1 | 20.00 | 1 | 20.00 | 3 | 60.00 | 5 | 100.00 |
| Total | 29 | 71.43 | 62 | 153.81 | 9 | 74.76 | 100 | 300.00 |

$$r=0.56$$

The linear scattered correlation graph shows $r=0.56$, which suggests strong positive correlation between vitamin B12 in mother and child.

Table 2: Vitamin B12 Levels In Mother And Anthropometry At Birth.

| Vitamin B12 (pg/dL) in mother | Anthropometry | | | | | |
|-------------------------------|---------------|------|--------------|------|--------------|--------|
| | HC (Cms) | | Length (Cms) | | Weight (Gms) | |
| | Mean | SD | Mean | SD | Mean | SD |
| <211 | 33.50 | 1.15 | 48.19 | 2.40 | 2841.67 | 503.83 |
| 211 to 911 | 33.87 | 1.21 | 49.11 | 2.47 | 2968.57 | 431.50 |
| >911 | 33.60 | 0.55 | 49.94 | 3.24 | 1080.00 | 356.37 |
| | df=2 | | df=2 | | df=2 | |
| | F= 1.140 | | F= 2.300 | | F= 0.900 | |
| | P= 0.324 | | P= 0.010 | | P= 0.407 | |

This table shows the Vitamin B12 levels in mother and anthropometry at birth. Babies born to normal Vitamin B12 mother had higher Mean HC (X-33.87, SD-1.21) than those babies (X-33.5, SD-1.15) born to lower vitamin B12 mothers, but it was not statically significant ($p=0.34$). Babies born to normal or higher vitamin B12 mothers had higher Mean Length (X-49.94, SD-3.24) than those babies (X-48.19, SD- 2.40) born to lower vitamin B12 mothers, and it was statically significant ($p= 0.02$). Babies born to normal vitamin B12 mothers had higher Mean weight (X-3080.00, SD-356.37) than those babies (X- 2841.67, SD-603.83) born to lower vitamin B12 mothers, but it was not statically significant ($p=0.40$).

Table 3: Vitamin B12 in child and anthropometry at birth.

| Vitamin B12 (pg/dL) in child | Anthropometry(Mean) | | | | | |
|---|---------------------|------|--------------|------|--------------|--------|
| | HC (Cms) | | Length (Cms) | | Weight (Gms) | |
| | Mean | SD | Mean | SD | Mean | SD |
| <211 | 32.93 | 1.04 | 46.78 | 1.60 | 2563.79 | 312.86 |
| 211 to 911 | 33.94 | 1.11 | 49.24 | 2.42 | 3026.61 | 585.32 |
| >911 | 33.72 | 0.97 | 50.06 | 2.43 | 3088.89 | 284.80 |

df=4 df=2

F=8.690

F=14.300

F= 9.170

P= 0.000

P= 0.020

P= 0.000

This table shows the correlation between vitamin B12 level in babies and their anthropometry at birth; suggests that babies born to normal or higher vitamin B12 level mother mean HC (33.72 ± 0.97), mean Length (50.06 ± 2.43) and mean weight (3088.89 ± 284.80) than babies (Mean HC 32.93 ± 1.04 , Mean Length 46.78 ± 1.60 , Mean weight 2563.79 ± 312.86) born to low vitamin B12 mothers and it was statically significant, ($p=0.00, 0.02, 0.00$).

Table 4: Vitamin B12 levels in mothers and mean DASII scores.

| Vitamin B12 (pg/dL) in mother | Motor | | Mental | |
|----------------------------------|--------|-------|--------|-------|
| | Mean | SD | Mean | SD |
| <211 | 109.11 | 38.65 | 98.44 | 34.26 |
| 211 to 911 | 130.01 | 31.45 | 120.91 | 31.06 |
| >911 | 125.36 | 25.66 | 131.92 | 22.25 |

Motor development df=2,00 F =3,900 p= 0.023

Mental development df=2,00 F= 6,610 p=0.001

This table gives the correlation of Vitamin B 12 levels in the mothers and DASII mean mental and mean motor scores of their babies; show that Babies born to normal or higher vitamin B12 level mothers had higher Mean motor score (130.1 ±31.45) and Mean mental score (131.92 ± 22.25) than babies (109.11± 38.65, 98.44±34.26) born to low vitamin B12 level mothers and it was statically significant (p=0.023,0.00)

Vitamin B12 level in babies had a positive correlation with mother's vitamin B12 levels (r=0.56). Majority of the Babies born to mothers with lower vitamin B12 levels & babies with low vitamin B12 levels at birth had microcephaly, stunting & wasting (p<0.005) at all the follow ups. Low DASII motor score in babies was associated with low vitamin B12 level in mothers (p<0.005). Whereas, low DASII motor and mental score in babies had a positive association with their vitamin B12 levels at birth (p<0.005). Mother's parity had an inverse association with mothers as well as newborn's vitamin B12 levels (p<0.050). Mother's weight and their socio economic status showed a positive correlation with vitamin B12 levels in mothers and their babies (p<0.050). Mother's age had an inverse association with newborn's vitamin B12 levels (p<0.050).

CONCLUSION

The observations made in this study showed a strong positive correlation of vitamin B12 levels in mothers and their babies. The study results showed that Vitamin B12

deficiency in both mother is associated with Low birth weight, Stunting, Microcephaly and Developmental delay in their babies.

Thus this study prompts us for a policy change in the management of pregnant women with Prophylactic use of vitamin B12 along with Folic acid to prevent vitamin B12 deficiency in babies.

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