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RELATIONSHIP BETWEEN MATERNAL ANTHROPOMETRIC INDICES AND BIRTH WEIGHT OF THE NEW BORN

Neonatology

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ABSTRACT

Introduction: Body Dimensions Of The Mother Is A Key Determinant For A New Born Anthropometric Indices, Especially Birth Weight. Indirectly It Is Also Known That The Infant's Growth And Body Proportions Are The Indicator Of Mother's Nutritional Status, Therefore Birth Weight Of The New Born Is Related To Mother's Nutritional And Anthropometric Factor. **Aim And Objective:** The Study Is To Find The Correlation Of Maternal Anthropometric Parameter (weight, Height, And Bmi) On Birth Weight Of The New Born. **Materials And Methods:** Observational Prospective Study Done With Sample Size Of 540 Pregnant Women And Their New Born Delivered At Al-ameen Medical College And Hospital, Bijapur. During The Study Period Of 18 Months From Jan 2021 To Aug 2022, Weight, Height, And Bmi Of The Pregnant Women Is Recorded And It Is Correlated With The Birth Weight Of The New Born. **Result:** The Occurrence Of Low Birth Weight (lbw) Newborns Is
1) 81.8% Of Lbw Newborns Were Born To Mothers Having Bmi Of <18%.
2) 7.7% Of Lbw Newborns Were Born To Mothers Having Bmi Of 18 To 21%.
3) 5.8% Of Lbw Newborns Were Born To Mothers Having Bmi Of >21%.
4) 4% Of Lbw Newborns Were Born To Mothers Weighing >45 Kgs.
5) 37.93% Of Lbw Newborns Were Born To Mothers Weighing <45 Kgs.
6) 10% Of Lbw Is Recoreded With Mother's Height Of <145 Cms And
7) 25% Of Lbw With Mothers's Height Of >145cm
Conclusion: Maternal Bmi And Weight Have Strong Positive Correlation With The Birth Weight Of The New Born, Whereas Height Of The Mother Does Not Have Any Relation With The Weight Of The New Born. Bmi Is Having Closest Relationship With Birth-weight Which Tends To Be Inversely Proportional To Height And Directly Proportional To Weight. Therefore, Interventions Should Be Taken During Pregnancy To Improve The Nutritional Status Of The Mother Because It Is An Important Regulator Of Fetal Growth And Has A Vital Influence On Long Term Health Aspect Of The Newborn.

KEYWORDS

Maternal anthropometry, Body mass index (BMI), Birthweight, LBW

INTRODUCTION

Intrauterine growth is now recognised as a significant factor in both short and long-term outcomes for an individual.

Body dimensions of the mother is a key determinant for new born anthropometric indices, especially birth weight of the new born Mothers' nutritional status is also known to be a key indicator of infants' birth weight, body dimensions and its early growth feature.[1]

Health of the newborns is significantly impacted when pregnancies are complicated by extrinsic factors like parental factors, improper maternal nutrition, maternal anaemia, or smoking.

Birth weight in particular is strongly associated with neonatal and post natal mortality with infant & child morbidity.

Low birth weight increases the risk of death in early part of life, those who survive tend to have impaired immune function and increases the risk of infection and reduced muscle strength, cognitive ability and IQ throughout their life.[2]

Maternal anthropometric measurements provide simple, cheap and available means of predicting birth weight with a variable degree of reliability.[3]

AIM AND OBJECTIVE

The study is to find the correlation between maternal anthropometric parameters (weight, height and BMI) and birth weight of the new born

MATERIALS AND METHODS

This Observational Prospective Study was done at Al-Ameen Medical College and Hospital, Bijapur with the sample size of 540 pregnant women and their new born delivered between Jan 2021 and Aug 2022. Weight, height and BMI of the pregnant mother were considered and correlated with birth weight of the new born.

Inclusion Criteria:

- Booked pregnant women who were willing to give informed consent and able to comply with the study protocol.
- Neonates delivered through all modes of delivery.

Exclusion Criteria:

- Babies with any obvious congenital anomalies.
- Maternal infection leading to preterm delivery.
- Mothers who were smokers, consumers of alcoholic beverages.
- Mothers on medication for chronic medical problems.
- Maternal use of Injection/ oral steroid for prolonged period (>2weeks).
- Twin pregnancy.

RESULTS AND OBSERVATIONS

Table1: Frequency Distribution According To Birth Weight

B.wt in kgs	Frequency	Percent
<2.5 kgs	120	22.20%
2.5 - 3 kgs	240	44.50%
>3 kgs	180	33.30%
Total	540	100%

TABLE1: In this study out of 540 newborn 44.5% fall under B.wt of 2.5-3 kgs, 33.3% fall under B.wt of >3kgs and 22.2% fall under < 2.5kgs

Table 2: Association Between Birth Weight And Mothers' Bmi, Weight And Height

Para-meter	<2.5 Kgs	2-3 Kgs	>3 Kgs	Total	p. value
BMI					

<18%	90 (81.8%)	10 (9.1%)	10 (9.1%)	110 (20.3%)	<0.001
18-21%	20 (7.7%)	180 (69.3%)	60 (23%)	260 (48.2%)	
21-26%	10 (5.8%)	50 (29.5%)	110 (64.7%)	170 (31.5%)	
WEIGHT					
<45 kgs	110 (37.93%)	100 (34.4%)	80 (27.5%)	290 (53.7%)	<0.001
>45 kgs	10 (4%)	140 (56%)	100 (40%)	250 (46.3%)	
HEIGHT					
< 145 cm	10 (10%)	60 (60%)	30 (30%)	100 (18.5%)	0.628
>145 cms	110 (25%)	180 (41%)	150 (34%)	440 (81.5%)	

Relation of maternal BMI with birth weight of new born:
- The occurrence of low birth weight (LBW) is higher 81.8% in mothers having BMI of <18%
- Only 5.8% of low birth weight in mothers' BMI of >21%
- Only 7.7% of LBW in mothers' BMI of 18 to 21%.
- P value is <0.001 so the relation is significant

Relation of maternal weight with birth weight of new born:
- The occurrence of LBW is 37.93% in mothers' weight of <45 kgs and
- Only 4% of LBW with mothers' of weight >45kgs.
- P value is <0.001 so the relation is significant

Relation of maternal height with birth weight of new born:
- Only 10% of LBW is recorded with mothers' height of <145 cm, but 25% of LBW with mothers' height of >145 cm.
- P value is 0.628 so the relation is insignificant.

Review Of Literature:
Lawoyin et al[4] and **Han Z et al**[5] found that mothers who are underweight with BMI of < 18 kgs/m^2 had significantly higher incidence of having lower birth weight babies and concluded that maternal nutritional factor both before and during pregnancy accounts for > 50% of cases of LBW in developing countries.

Shamsum et al[6] documented that the maternal anthropometric parameter such as weight, height, BMI , weight gain during pregnancy, socioeconomic status are major determinants of birth weight of neonate.

CONCLUSION
Based on the results of this study and other studies reported in this literature, it can be concluded that the maternal anthropometry such as BMI and weight have strong positive association with birth weight of newborns.

BMI (Kg/m^2) of mother shows closest relationship with baby's birth weight. It is inversely proportional to height and directly proportional to weight of mother. Out of the three parameters examined, height of the mother didn't have any relation with weight of the newborn.

Maternal nutrition during pregnancy has a vital influence on long term health aspects of fetus and it is an important regulator of fetal growth.

Use of anthropometry to assess maternal malnutrition can be useful in reducing incidence of LBW, neonatal mortality and improve quality of life Therefore interventions during pregnancy should be taken to improve nutritional status of the mother.

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