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An observational study to assess the relation between placental weight and neonatal weight at term deliveries in pregnant woman taking Vegetarian and Mixed Diet

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ABSTRACT

Now a day's women have become highly qualified and working in the corporate world, In this busy lifestyle they are consuming junk food. In pregnant women such lifestyle will be dangerous to both mother and baby, in mother it may lead to complications related to pregnancy like placenta previa, miscarriages etc. and birth related complications such as low birth weight or any type of developmental anomalies. **Materials & Methods:** Newborn baby, Placenta and weighing machine formed the materials and the weight of both checked & evaluated the relation between them. Data was collected from total 100 (50 in each group) delivered women from BLDEA's AVS AMV Hospital & BLDEU'S Shri. B. M. Patil medical college hospital and other hospitals. **Observation & Results:** After delivery weight of placenta & neonate baby weight were recorded in both groups. It was noted in mixed diet group both weight of neonate was high compared to vegetarian group and weight of placenta was high in vegetarian group compared to mixed diet. Overall, the common ratio between Placenta weight & Neonate weight (1:6) was maintained in mixed diet group & it was not observed in vegetarian group. **Conclusion:** Study has proved the significance role of nutrition during antenatal period. Relation between neonatal & placental weight were significantly high compared to vegetarian diet group. Ratio of these two was normal in mixed diet group.

Key words: *Apara, Placenta, Placental weight, Neonatal weight.*

INTRODUCTION

The word placenta comes from the Latin word for a type of cake, from Greek, "flat, slab-like", in reference to its round, flat appearance in humans. The placenta is a temporary organ that connects the developing fetus via the umbilical cord to the uterine

wall to allow nutrient uptake, thermo-regulation, waste elimination, and gas exchange via the mother's blood supply to fight against internal infection; and to produce hormones which support pregnancy.^[1]

Placenta is the most important organ for maintaining healthy pregnancy. It exchanges gases and nutrients needed for fetus.^[2]

The ability of the fetus to grow and thrive in utero depends on the placental function and the average weight of the placenta at term is 508 g. The ratio between placenta weight and birth weight of the newborn is 1:6.^[3]

In *Ayurvedic* classics placenta is compared to *Apara*. After fertilization of ovum cessation of *Artava* will be there i.e., after impregnation the openings of *Arthavaha-srotus* are obstructed by conception, due to this very reason the *Arthava* (menstruation) is not seen after conception. Then this very *Arthava* being

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repelled from downward passage goes upward and gets accumulated, which is known as *Apara* or *Jarayu*.^[4]

Dalhana quoting the passage of *Bhoja* says that from *Raktha* (blood) placenta and from *rasa* the umbilical cord of fetus is formed. *Indu* opines that beside the accumulation of *Artava* the diet (used by mother) also plays a role in gradual formation of placenta.^[5]

Healthy diet should be comprised of well-balanced protein (lean meat, poultry and fish), vegetables, whole grains, legumes, fruits, nuts, and healthy unsaturated fats. In addition to the balanced diet, most women should take a multivitamin and folic acid prior to conception and during pregnancy. Women tend also to be deficient in iron due to the monthly menstrual blood loss. During pregnancy, the baby demands a significant amount of iron fetuses have their way to absorb iron actively from the maternal blood and if the mother is deficient in iron, then she will become anemic not the fetus.^[6]

Protein is found in both, animal species as well as earth products (nuts, legumes, etc.). Animal derived proteins are the ideal complete protein food. Animal meat contains all the essential amino acids as well as essential fatty acids. In contrast, plant derived proteins are incomplete because none of the protein sources provides all the essential amino acids; one would need to spend significant time trying to obtain a variety of vegetable protein sources that is very difficult to achieve. However, taking a balanced protein approach means that one should take some of our protein from animals and some from plant related products.^[6]

The consumption of animal protein is by definition associated with the consumption of fat also. Fish derived fat is the healthiest fat because it is rich in omega-3 fatty acids. In animals that are fed naturally (grass-fed), fat is 50% saturated fat and the rest is polyunsaturated; pastured grass-fed cattle should always be chosen instead of any corn-fed cattle. Eating the appropriate amount of protein during pregnancy means no more than 20% of the total calories. Eating more protein can be harmful due to its

negative caloric effect. Protein is a structural food that is best used for the building blocks of our bodies and not for energy production; protein metabolism for energy production leads to energy restriction.^[6]

One glass of milk contains 300 mg of calcium like-wise; 1 ounce of Swiss cheese contains the same amount of calcium. Whole milk and cheese as well as other unadulterated dairy products are a good source of high-quality protein, a small portion of carbohydrates and of course animal (saturated) fat. Regular unsweetened yogurt is preferable and much healthier than frozen yogurt that contains huge amounts of sweeteners such as corn syrup. In contrast, yogurt with added portions of various fresh fruits can be a very healthy and nutrient dense food. In addition, yogurt provides some probiotics.^[6]

AIMS AND OBJECTIVES

1. To make comprehensive study on *Apara* with special reference to placenta.
2. To evaluate relation between placental weight and neonatal weight in both the groups.

MATERIALS & METHODS

Materials: Newborn baby, Placenta and weighing machine.

Methods: Checking the weight of neonate, placenta and evaluating relation between them.

Source of the Data

Data was collected from BLDEA's AVS Ayurveda Mahavidyalaya Hospital, Vijayapur, BLDEU'S Shri. B. M. Patil Medical College Hospital and other hospitals of Vijayapur.

Study Design: Randomized collection of data

Sample size: 100 (50 in each group)

Study groups

Group I: Pregnant women consuming Vegetarian diet only.

Group II: Pregnant women consuming Mixed (Vegetarian and Non vegetarian) diet.

Assessment criteria

a. Inclusive criteria

- Full Term deliveries
- Age group :20-35yrs
- Middle-class socio-economic status

b. Exclusive criteria

- Pregnancy induced diabetes mellitus and hypertension
- Any congenital anomalies
- Placental anomalies

Method of collection of data

Soon after delivery the neonatal baby weight & placental weight (without umbilical cord) were recorded.

OBSERVATIONS & RESULTS

Table 1: Showing Distribution of subjects according to Age (Years)

Age (Years)	Group I (Vegetarian)		Group II (Mixed Diet)	
	N	%	N	%
< 25	26	52.0	28	56.0
25 - 29	17	34.0	20	40.0
30+	7	14.0	2	4.0
Total	50	100.0	50	100.0

Graph 1: Showing Distribution of subjects according to Age (Years)

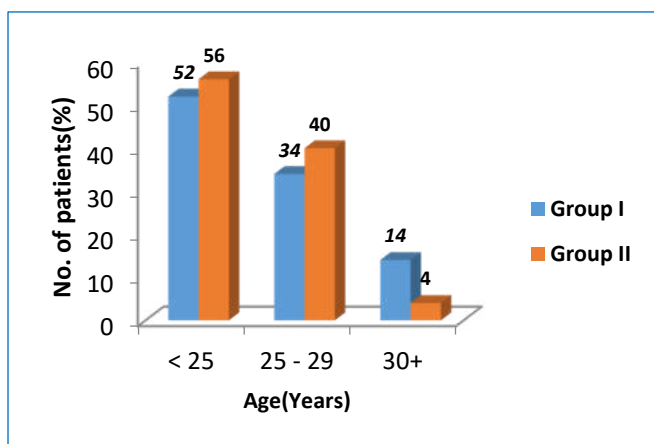


Table 2: Showing Comparison between significant value of age, neonatal weight & Placental weight Group I and Group II

Variables	Group I (Vegetarian)		Group II (Mixed Diet)		Mann Whitney U test	Remark
	Mean	SD	Mean	SD		
Age	25.20	3.881	24.76	3.566	U=1163.00	P=0.5530
Neonatal Weight	2.1580	0.348	2.8006	0.606	U=287.00	P<0.0001*
Placental Weight	482.3800	84.441	470.740	78.351	U=1119.0	P=0.3668

*: Statistically significant

Graph 2: Showing Comparison between neonatal weight & Placental weight Group I and Group II

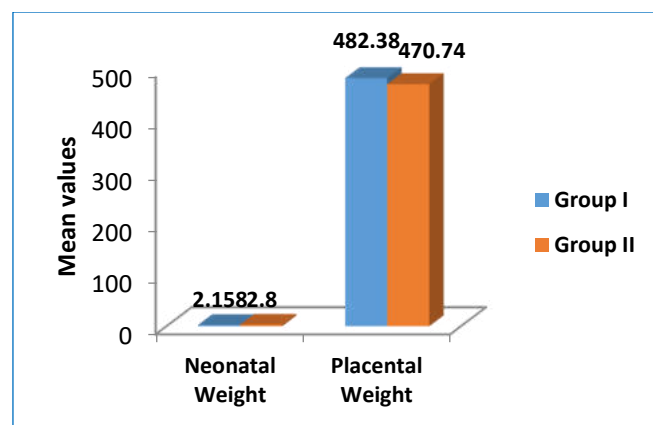
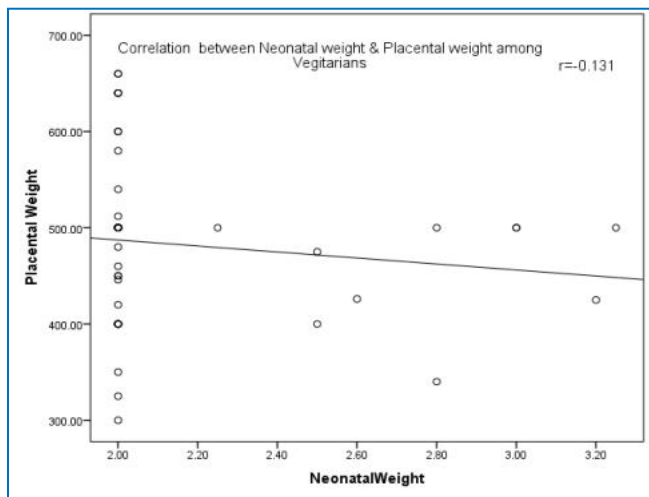


Table 3: Showing Correlation between Neonatal Weight and Placental Weight in Group I and Group II

Correlation between Neonatal Weight and Placental Weight in			
Groups	Spearman's Correlation coefficient r	Significant value	Remark
Group I	r=-0.131	P=0.365	Mild negative correlation

Group II	r=0.415	P=0.003*	Moderate positive correlation, and it is significant
*: Statistically significant			

Graph 3: Showing Correlation between Neonatal Weight and Placental Weight in Group I



Graph 4: Showing Correlation between Neonatal Weight and Placental Weight in Group II

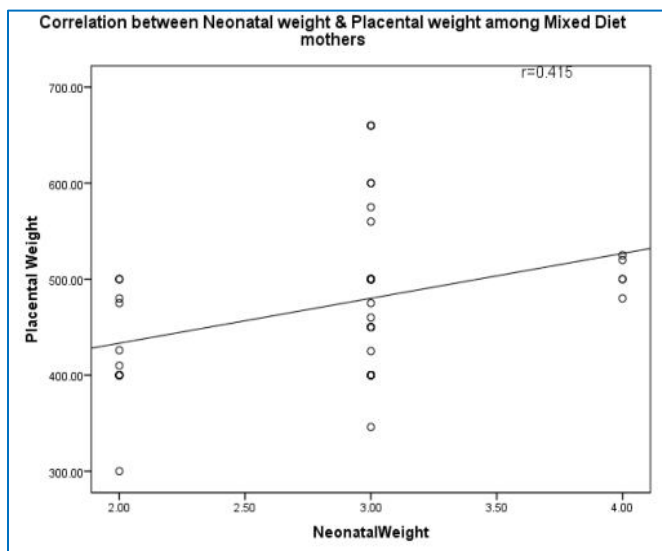


Table 4: Showing mean value of CT & BT in Group I & Group II

Groups	Diet	CT	BT
Group I	Vegetarian	4.323	2.21
Group II	Mixed Diet	4.2508	2.4554

Graph 5: Showing Comparison between CT & BT of Mothers in both groups

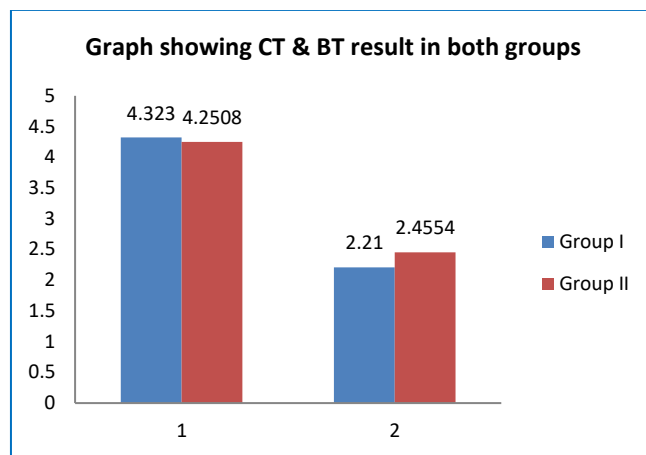
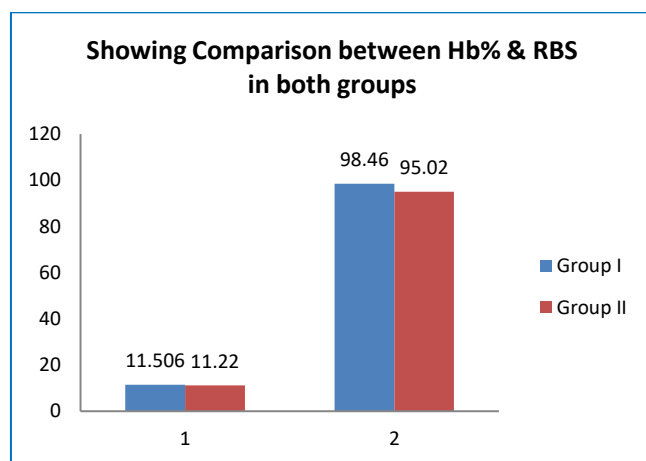


Table 5: Showing mean value of Hb & RBS in Group I & Group II

Groups	Diet	HB Mean	RBS
Group I	Vegetarian	11.506	98.46
Group II	Mixed Diet	11.22	95.02

Graph 6: Showing Comparison between Hb% & RBS of Mothers in both groups



DISCUSSION

Placental weight and birth weight of the neonate are widely available measures. The ratio of these two variables is a useful marker of foetal nutrition and utero-placental function. The mean placental weight in Group I is 482.38 gms & in Group II is 470.740 gms,

the mean neonatal weight in Group I is 2.1580 kg & in Group II is 2.80 kg.

Thousands of years ago our ancestors received all the nutrient supplements from fruits, vegetables and nuts. Such carbohydrates comprised approximately 20-30% of their calories the rest was from animal meat and fat.

Non vegetarian food is loaded with proteins, vitamins and minerals. It contains the haem-iron which is very easily absorbed.

A portion of non-vegetarian foods daily provides essential fatty acids to mother and hence ensures healthy growth of the fetus. Non vegetarian mothers have an extra benefit over vegetarian mothers. Because animal derived proteins are the ideal complete protein food. Animal meat contains all the essential amino acids as well as essential fatty acids.

Fruits contain in addition to the fructose a large number of various vitamins and antioxidants. Vitamins help our cells function properly and antioxidants neutralize "reactive oxygen species" that damage our cells and promote premature aging. Fruits also provide a significant amount of water, minerals and fiber. Fiber promotes a healthy intestine and minerals are essential in the various metabolic processes as well as for the creation of electrical signals for the transmission of messages by the nerves to the various organs as well as across the membranes of the cells. Vegetables also contain protein and fat albeit in smaller quantities than the legumes and nuts. Ideally, all the carbohydrates should be provided by means of fruits, legumes, whole grains, and vegetables. Potatoes for practical purposes should not be considered vegetables. Baked or boiled potatoes are the healthier form of this food but still, potatoes contain so much pure simple carbohydrates that they are almost equivalent to plain sugar.

Dry fruit that is not sweetened with extra sugar is healthy also but one should remember that dry fruit is high in fructose and it is easier to eat more than when one eats fresh fruits, which are balkier and more filling; this leads to excess amount of fructose. The frozen varieties of fruits and vegetables are

acceptable but the canned should be avoided due to added sugar and corn syrup.

Organically grown fruits and vegetables are much better and nutrient richer than conventionally grown. For good fetal nutrition, to the extent possible, one should seek to get only organic unless not available. Although organic fruits and vegetables are preferable to conventionally grown, conventionally grown fruits and vegetables are far more important than no fruits at all. Like-wise, a glass of natural fruit juice is better than nothing but eating the whole fruit is the better thing to do.

In the present study full term pregnant women were selected and divided in to two groups based on their diet. Later on, subjected to basic hematological investigations like Hb %, CT, BT RBS & HbsAG. Women's whose investigation falls under normal limits for Hb, CT, BT, RBS and negative for HbsAG were included in the study.

Soon after delivery weight of the baby weight of the placenta were recorded.

Table & Graph no 1, 2, showing the comparison of significant value of age, neonatal weight & placental weight in both groups.

Table no 3 & Graph no 3, 4, It was found that the proportionate ratio between placental weight & neonatal weight were in normal as mentioned in the textual reference, in women consumed mixed diet during the period of pregnancy i.e., in group II. Where as in group I women consumed only vegetarian diet during the period of pregnancy the proportionate ratio between placental weight & neonatal weight were in nearer to normal as mentioned in the textual reference.

Table no. 4 & Graph no. 5 showing the mean value of BT in both groups it was observed that mean bleeding time was less in group I compared to group II. & showing the mean value of CT in both groups. It was observed that mean clotting time was less in group II compared to Group I.

Table no. 5 & Graph no.6 showing the mean value of Hb % in both groups. It was observed that group I

showing comparatively high & showing the mean value of RBS in both groups. It was found that mean RBS value was high compared to Group II but both values were under normal limit.

It was observed that all the mean values i.e., Hb %, CT, BT, RBS was under normal limit in both groups.

It's clear that mixed diet will provide proper nutrition to the mother & baby too hence significant results were observed in group II in comparison to group I.

Hence the women of group II who consume mixed diet have more placental weight & neonatal weight compare to group I

CONCLUSION

Study has proved the significance role of nutrition during antenatal period. Relation between placental & neonatal weight were significantly high in mixed diet group when compared to vegetarian diet group. Ratio of these two was normal in mixed diet group it was nearer to textual reference i.e., 1:6

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