

Review article

Pregnancy and Nutrition

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Abstract

Pregnancy is a specially important time in women's life to focus on proper health care and nutrition. Nutrition during childhood and adolescence influence a women's preconceptional nutritional status which subsequently influence the outcome of pregnancy and health of the baby. Good nutrition is the key to a successful pregnancy for both mother and child. The mother's nutrition from the moment of conception is an important factor in the development of the infant's metabolic pathway and future wellbeing. The diet during pregnancy should be adequate to provide maintenance of maternal health, the need of growing fetus, the strength and vitality required during labour and successful lactation. All women need to gain weight during pregnancy. Weight gain during pregnancy depends on pre-pregnancy weight. A healthy weight gain for most of the women is between 25-35Lb. During pregnancy a women has different nutritional need for different trimester to meet extra food needs and extra caloric requirement. Normal weight women need an extra 300 kcal /day during the 2nd and 3rd trimester of pregnancy. The total amount of needed calorie 2000-2500 kcal/day for a normal weight women. Needs for almost all nutrients are greater during pregnancy for own bodies growth, for baby and successful lactation. The dietetic advice given to the mother should be reasonable and realistic to the individual women.

Key words: Pregnancy, nutrition, weight gain.

Introduction

Good nutrition is the key to a successful pregnancy for both mother and child. It is especially important during child bearing years. The types and amount of food taken during pregnancy can affect the growth and development of the baby. What pregnant women eat will have a great impact on her unborn child during development and in the future. Eating well can help her have a healthy pregnancy and a healthy newborn. It can also contribute to the development of wholesome eating habits for the growing child.

During pregnancy, there is increased calorie requirement due to increased growth of maternal tissue, fetus, placenta and increased BMR. The increased calorie requirement is to extent of 300 kal over non-pregnant state during 2nd half of pregnancy¹.

The diet during pregnancy should be adequate to provide –Maintenance of maternal health, the need of growing fetus, the strength and vitality require during labour, successful lactation².

The mother's nutrition from the moment of concep-

tion is an important factor in the development of the infants' metabolic pathways and future well being. The pregnant women should be encouraged to eat a balanced diet and should be made aware of special needs for iron, folic acid, calcium and zinc^{3,4}.

Weight Gain During Pregnancy

All women need to gain weight during their pregnancy. Adequate weight gain during pregnancy is needed to provide the mother and child with good nutrition. Weight gain during pregnancy depends on pre-pregnancy weight gain. A healthy weight gain for most of the women is between 25 to 35Lb. A gradual weight gain is important during the first 3 month, a weight gain of only 2Lb to 4Lb is adequate since the fetus is very small at this time. Starting with the 4th month of pregnancy, most women need an extra 300 calorie per day. After that a weight gain of ½ to 1 Lb/week or 3 to 4Lb/month is suggested. Too much or too little weight gain may cause health problem for both mother and fetus. Fetus is only part of weight gain. If weight gain is less, the chances of fetus for good health go down at birth and on later

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life. Under weight women may need to gain more, whereas obese women should gain only 7-11.5 kg (15-25Lb). Heavier women and those with excessive weight gain during pregnancy are likely to have macroscopic infants. Inadequate weight gain is associated with small for gestational age (SGA) infant. A weight gain of 11.5-16 kg (25-35Lb) during singleton pregnancy is recommended. For a twin pregnancy, 35-45 Lb, for a triplet 50Lb weight gain is recommended.^{6,8} Most healthy baby, weight gain between 7-8Lb, some baby little less and some more. The fetus gain most of the weight and has rapid brain growth in last weeks of pregnancy^{5,6,7}.

A women should not try to loose weight during pregnancy, because it she do not eat required calories or variety of foods, the baby will not get the nutrients, she or he needs to grow^{1,8,9}.

Table-I: Recommended weight gain during pregnancy as follows: ^{6,7,8}.

Pre-pregnancy weight	Recommended weight
Average adult weight for height	25-35 Lb
Under weight	28-40 Lb
Over weight	15-25 Lb
Obese	15 Lb

Table-II: Based on a “normal” pre-pregnancy weight, this chart shows how the weight gained during pregnancy is distributed: ^{6,7,8}.

Affected anatomy	Additional weight
Fetus	7.0Lb
Placenta (after birth)	1.5Lb
Amniotic fluid	2.0Lb
Uterus	2.0 Lb
Breasts	1.0 Lb
Blood	3.0 Lb
Fluid	3.0 Lb
Fat	9.0Lb
Total	28.5Lb

Daily Food Guide And Calorie Requirement

The pregnancy diet ideally should be light, nutritious, easily digestible and rich in protein minerals and vitamins. Dietetic advice should be given with due consideration to the socioeconomic condition, food habit and the test of the individual.

During pregnancy a women has different nutritional

needs for different trimester. To meet extra food needs, a women need to add an average 300 Kcal extra calories per day to her diet after first trimester. At this extra calories, with extra servings of milk, low fat cheese, lean meats, poultry, fish, leafy and dark green vegetables, dried beans and pear, fruits, whole grain and enriched breads and cereals^{3,4}.

Women with normal BMI should eat as to maintain the schedule weight gain during pregnancy. Diet-2000-2500kcal/day for normal weight women and restriction to 1200-1800 kcal/day for over weight women is recommended. A healthy eating plan for pregnancy includes a variety of nutrient rich food. Eating a variety of foods that provide enough calories help the mother and the body gain the proper amount of weight. During the first three month of pregnancy the pregnant women do not need to change the number of calories, she get from her food she eat. Normal weight women need an extra 300 cal/day, during the last 6 month of pregnancy. This total amount 2000-2500 cal/day. If any one is under weight or over weight or obese before become pregnant or it is a twin pregnancy need of calories may be different^{10,11,12}.

Table-III: Recommended daily dietary allowances for non pregnant and pregnant women are given below ³

	Non pregnant women (Age in years)				Pregnant Women
	15-18	19-24	25-50	50+	
Energy (Kcal)	2100	2100	-2100	-2000	+300
Protein (g)	48	46	46	46	+30
Fat- soluble vit.					
Vit. A (IU)	800	800	800	800	800
Vit. D (IU)	400	400	200	200	400
Vit. E (IU)	8	8	8	8	10
Water soluble vit.					
Vit. C (mg)	60	60	60	60	70
Folate (ng)	180	180	180	180	400
Niacin (mg)	15	15	15	13	17
Riboflavin (mg)	1.3	1.3	1.3	1.2	1.6
Thiamine (mg)	1.1	1.1	1.1	1.0	1.5
Vit. B6 (mg)	1.5	1.6	1.6	1.6	2.2
Vit. B12 (mg)	2	2	2	2	2.2
Minerals					
Calcium (mg)	1300	1000	1000	1200	1000
Iodine (mg)	150	150	150	150	150
Iron (mg)	15	15	15	15	30
Magnesium (mg)	300	280	280	280	300
Phosphorus	1200	800	800	800	1200
Zinc (mg)	12	12	12	12	15

Food Groups

Needs for almost all nutrients (vitamin and minerals) are greater during pregnancy. Nutrients are important for own body's growth for baby and later for breast feeding¹¹.

Healthy protein: At least half of the total protein should be first class containing all essential amino acid. Good source of protein are chicken, fish, lean meat, low fat dairy products, eggs, bean and nut. Fish is the source of DHA. If any one is not able to eat fish, she should try other source of DHA like, walnuts, wheat germ, omega 3 enriched eggs or consider taking a supplement with DHA.

Healthy fat: Majority of the fat should be animal type contain vit. A and D. Pregnant and breast feeding women needs healthy fat for baby's development. One should avoid transfat as food with hydrogenated or partially hydrogenated fat like many packaged and processed foods, fried foods and fast food. Limits saturated fat like butter, whole milk dairy products, high fat meat. Healthy fat, are found in olive oil, fatty fish, canola oil, peanut butter, nuts, seeds etc.

Healthy carbohydrates: Fruits and vegetables are healthy source of carbohydrates. Dark and bright colour fruits and vegetables are richer source of vitamins and minerals. Whole fruit rather than juice is acceptable. Eat whole grain products like brown rice, whole wheat bread etc. Limit instant grains and refined carbohydrate like cookies, soda etc.

Fluid: One should drink enough water to never feel thirsty. So urine is light in colour. Choose pasteurize low fat milk, limit juice and beverage which are high in calories.

Vitamins and minerals: If any one is planning for pregnancy, she should take vitamins and minerals supplement that includes 400mg of folic acid to prevent birth defect and 200-400 I.U of vit. D. In some cases a women's diet may not include enough of a certain nutrient such as iron, or calcium and additional supplement may be necessary. Women, who follow vegetarian diet, usually require vit. B12, D and zinc.

During pregnancy she should take prenatal vitamin and mineral supplement that includes 220 µg of iodine and does not contain more than 30 mg of iron. To get calcium, drink 2-3 cup of low fat milk. If any body cannot to get needed calcium through food to take calcium supplement.

The pregnant women may need vit. B12 supplement, if she is complete vegetarian, calcium supplement

under age 25 years specially if she does not drink enough milk^{10,11,12}.

Iron and Folate:

The amount of iron and folate in diet is very important. So one should eat food containing these nutrients often.

Iron: More iron is needed during pregnancy for the baby. But it is hard to get enough iron from food alone. There is a negative iron balance during pregnancy and the dietetic iron is not enough to meet the daily requirement specially in the 2nd half of pregnancy. Thus the supplement iron therapy is needed for all pregnant mothers from 16 weeks onwards. Iron should be taken in between meals or at bed time on an empty stomach for its better absorption^{1,2}. The iron in meat, fish and poultry is more readily absorbed by the body than the iron in plant foods. To increase iron absorption, eat plant foods with meat or with foods that contain vit. C^{10,11,12}.

Folate : Folate is a 'B' vitamin that helps body to make RBC and genes. During pregnancy, double amount of folate is needed. Pregnant women should eat various food containing folate, to get its required amount^{1,2,10}.

Table-IV: Food sources of Iron and Folate^{3,4}

Iron rich food	Folate rich food
Lean meat, poultry, fish, organ meat such as liver.	
Dried beans and peas	
Dark green vegetables	
Whole grain and enriched breads and cereals.	
Liver	
Dried beans and peas	
Dark green leafy vegetables	
Whole grain breads and cereals, cereals fortified with folic acid.	
Fruits (such as oranges and orange juice, grape fruit, bananas, tomatoes).	

Sodium: Salt does not need to be restricted in pregnancy for most of the women to avoid excessive salt, limit intake of highly process food such as canned soup, salted snacks etc.^{13,14,15,16}.

Food Safety And Preparation

During pregnancy women are at increased risk of food born illness because of hormonal changes during pregnancy weakens the immune systems. So, one should wash hands before and after food preparation. Wash fruits and vegetable well. Food should be cook well. Meat, fish, eggs and poultry should

properly handled. Egg should be cooked until firm. Avoid half done food, raw meat, unpasturized milk¹⁷.

Avoidance Of Food

There are certain foods and beverage that are harmful for the fetus, if they are taken during pregnancy. Fish with high level of methyl mercury Soft cheese – goat cheese, ready to eat meat- contain bacteria (listeria) which are harmful for unborn baby.

Raw or undercooked fish, meat or poultry.

Drinking alcohol can be dangerous to unborn child. More than 50% of the child born alcoholic mother syndrome, miscarriage, low birth weight. So both the RDA and the US surgeon general have recommended that pregnant women should avoid drinking any alcohol during pregnancy¹⁸.

Large amount of caffeine containing beverage. Caffeine is stimulant found in coffee, tea, Coca-Cola and some drugs. Pregnant women should take controlled food containing tea/coffee.

Women who smoke, put their babies at much higher risk of premature birth, low birth weight and still birth compared to non smoker, so pregnant women should avoid smoking^{5,19}.

Some drugs are appropriate for use during pregnancy. But there are some drugs, those are contraindicated during pregnancy. Women should avoid taking drugs in the first trimester unless it is indicated for any medical indication⁸.

Anything that are not food. Some pregnant women may have crave for something that are not food such as laundry starch, clay etc²⁰.

Women during her pregnancy period should avoid taking lots of cookies, candies, cakes, chips, soft drinks and fats such as butter, margarine, gravy, fried foods, salad dressings and mayonnaise. These high calorie foods provide very little nourishment for the mother and the baby^{21,22}.

Conclusion

Pregnancy is a specially important time in women's life to focus on proper health care and nutrition. It is important to take a life cycle approach to the issue improving nutrition among child bearing women and their children rather than focusing solely on nutrition during pregnancy and postpartum period. Nutrition during childhood and adolescence influence a women's pre-conceptional nutritional status which subsequently influence the outcome of pregnancy and health of the baby. Malnutrition is perpetuated across generation via this cycle. For this reasons, programme to improve the nutrition of women and children must be comprehensive targeting all stages of life cycle^{23, 25- 27}.

Policy makers and service provider's can take action by making maternal and child nutrition and integral part of the comprehensive programme that serve women and children.

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