Weight gain during pregnancy in urban woman in dual nutrition burden era

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- Pregnant women form one of the most vulnerable segments of the population from nutritional point of view.
- Studies in the 1970s have shown that Women from low income groups, subsist on inadequate dietary intake, are chronically undernourished and anaemic prior to pregnancy; there is no increase in dietary intake during pregnancy.
- Mean Weight gain in pregnancy ranged between 7-8 kg .
- Mean Birth weight was 2.7 kg and a third of infants weighed < 2.5kg at birth.
- These studies provided the basis on which ICDS food supplementation programme to pregnant women were initiated.
- Currently under-nutrition continues to be a problem; concurrently there has been an increase in over nutrition in women from all segments of population .
- There is very little data on pre-pregnancy weight, weight gain during pregnancy and birth-weight of the offspring during the current dual nutrition burden era.

- In the last two decades research studies have shown vitamin D deficiency is wide spread during pregnancy

- National Guidelines for “Calcium Supplementation During Pregnancy and Lactation” have been formulated under the Maternal Health Division, Ministry of Health & Family Welfare in December 2014.

- The guidelines envisage calcium 500mg (as calcium carbonate salt) and 250 IU vitamin D are to be taken twice daily just after meal starting from second trimester of pregnancy till six months postpartum.

- NFI is currently undertaking a study on Calcium and vitamin D supplementation to pregnant women in hospitals under research conditions and service conditions and in community setting.

CALCIUM AND VITAMIN D SUPPLEMENTATION IN PREGNANCY

Primary Health Care Institution in which the supplementation study was undertaken

- 100 pregnant women in second trimester willing to participate in the study were enrolled in each of the four seasons .
- Calcium (500mg) and Vitamin D (250IU)supplementation and nutrition education were given by research staff..
- A record of compliance was maintained.
- Monthly follow up carried out till delivery and information on course and outcome of pregnancy collected.

Primary Health Care Institution providing antenatal care under existing conditions

- 100 pregnant women attending the ANC second trimester and willing to come for follow up to the same clinic till delivery are enrolled in each of the four seasons.
- They receive calcium and vitamin D supplementation under existing constraints in the hospital.
- Data on composition of the tablets supplied in the hospital and on regularity of supplement supply and intake are recorded.
- Monthly follow up carried out till delivery and information on course and outcome of pregnancy is being collected .

Community setting

- To identify pregnant women in 30 anganwadies in 3 areas of South Delhi namely Neb Sarai, Lado Sarai and Andheria Mod a door-to-door survey has been done.
- Pregnant women identified during second trimester residing in those areas are being recruited throughout the year.
- Data on antenatal care from all providers, and supplementation prescribed/provided, regularity of intake are being recorded .
- Monthly follow up is being carried out till delivery and information on course and outcome of pregnancy are being collected .

- In all the three settings food frequency questionnaire are administered to all the enrolled women to assess whether there is any seasonal differences in the food consumption patterns .
- In a subsample diet survey are being done using 24 hour dietary recall.

Data on type and regularity of supplement provided, compliance rates and course and outcome of pregnancy in the three groups will be compared.

- Data on socio-demographic profile was collected using pre tested standardized proforma.
- During follow up for the calcium and vitamin D supplementation study, women were regularly weighed when they come to hospital and once a month in the community setting
- Delivery details were collected.
- In community settings data on pre pregnancy weight as well as weight three months after delivery were available in many women.
- Based on these data, it was possible to calculate the actual weight gain during pregnancy and changes if any between pre pregnancy weight and post pregnancy weight
- Data from these analysis are presented in the following presentation

Table No.1 : Enrolement of subjects	
Setting	No. of prgnant women
Primary Health Care Institution in which the supplementation study was undertaken	387
Primary Health Care Institution providing antenatal care under existing conditions	400
Community setting	448

A total of 1235 women were enrolled including all the three groups.

- A total of 4568 follow up visits were available with weight of pregnant women from all the three settings.
- From the follow up data in all the three studies, weight for gestational age was computed.

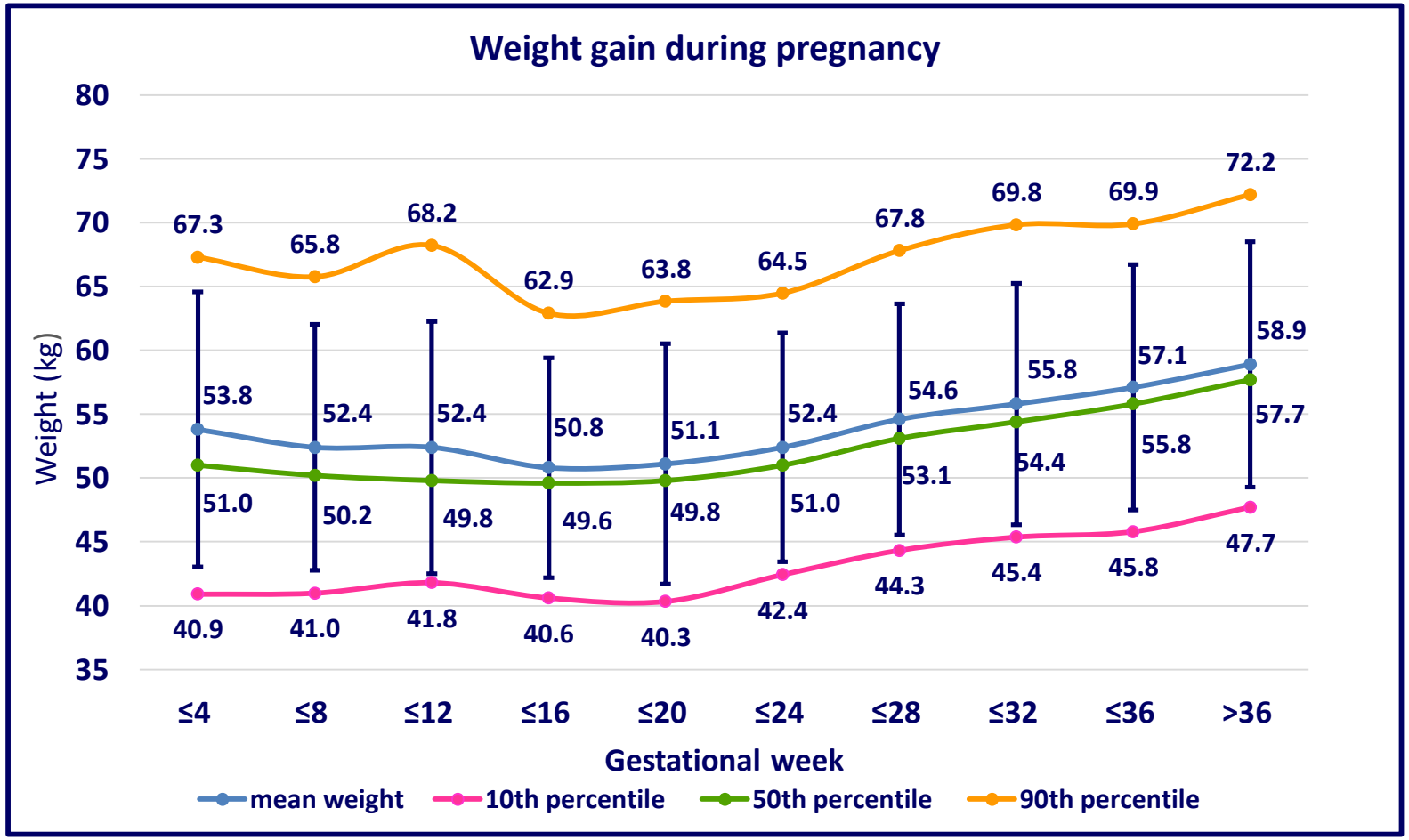
Table No.2 : Number of follow up visits with weight of pregnant women	
Setting	No. of visits with weight
Primary Health Care Institution in which the supplementation study was undertaken	1354
Primary Health Care Institution providing antenatal care under existing conditions	1388
Community setting	1826

Height was available in 1226 pregnant women.
The mean height of women in these studies was 151.3±5.48.
There has not been much change in the mean height of women over the last four decades.

Comparison of data from studies conducted in the 1970s and 80s showed that the mean weight in women had shown an increase of over five kg .

Data from national surveys have also shown that mean weight in women in their twenties have increased by 5-6 kg in different states.

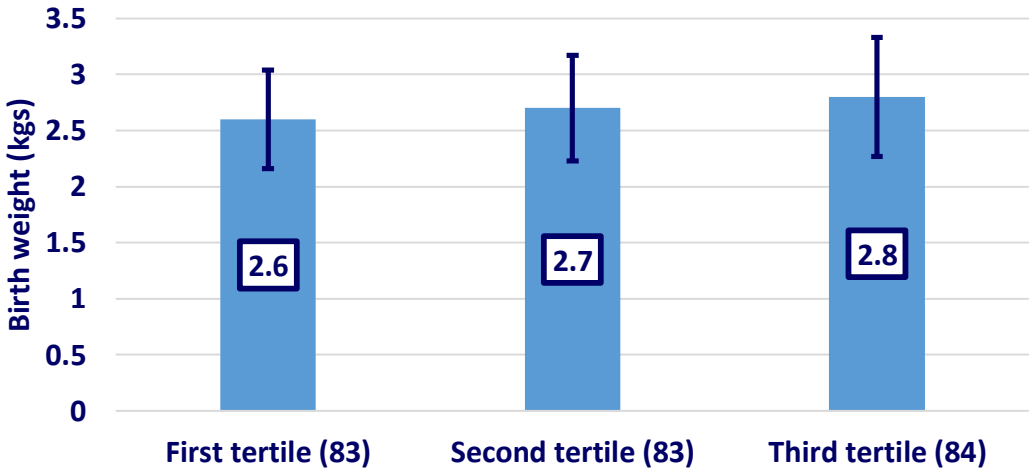
Table No.3 : Weight for gestation age	
Gestational age (Weeks)	**Mean weight**
≤4	53.8±10.76(71)
≤8	52.4±9.63(79)
≤12	52.4±9.88(122)
≤16	50.8±8.61(285)
≤20	51.1±9.41(614)
≤24	52.4±8.96(783)
≤28	54.6±9.05(754)
≤32	55.8±9.47(718)
≤36	57.1±9.61(679)
>36	58.9±9.62(463)

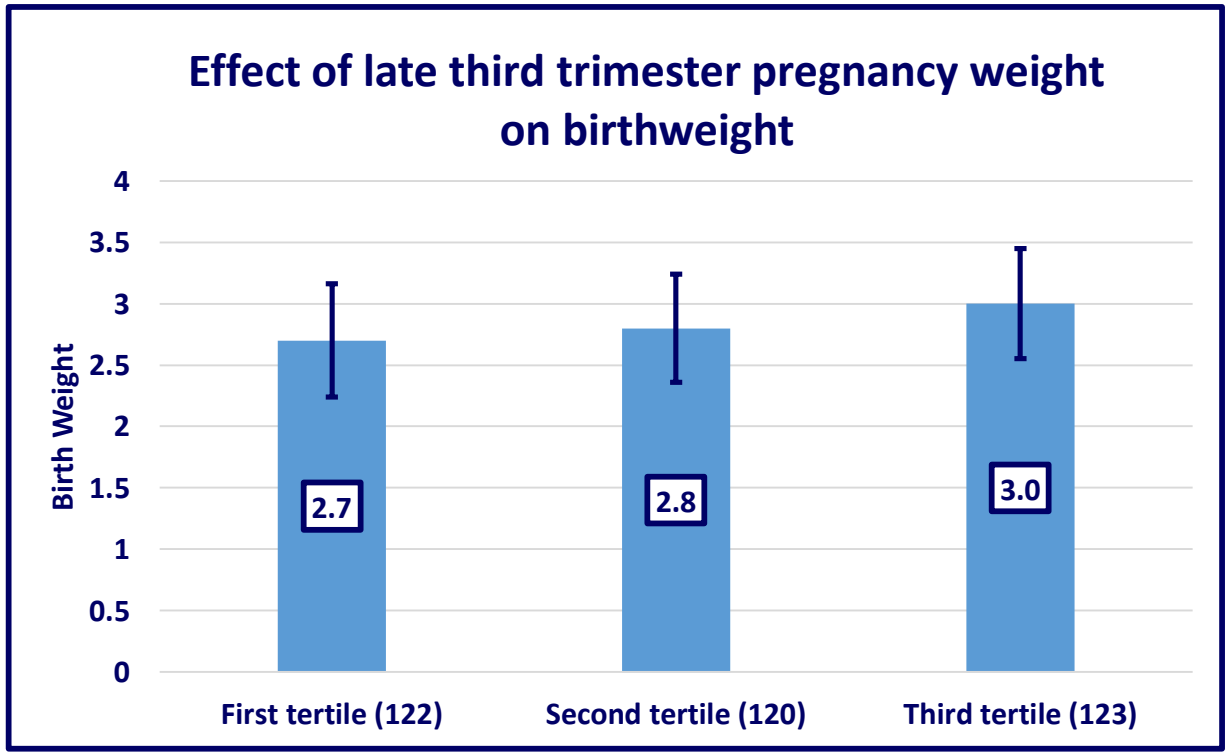


- **Based on the data on weight from follow up data, mean and median weight in different periods of gestation were computed and weight for gestational age chart was prepared.**
- **There was dip in the weight during first trimester attributed to nausea and vomiting in the first trimester**
- **Thereafter there was a progressive increase in mean weight in relation to gestational age.**

- **The mean weight gain in the whole group during pregnancy was 8.1kgs.**
- **At the 90^{th} percentile, the weight gain during pregnancy was 9.3 kg.**
- **At the 10^{th} percentile, the weight gain during pregnancy was 7.4 kg.**
- **The difference in weight gain during pregnancy in different tertiles was ranged between 7 to 10 kg.**
- **This difference in weight gain was largely due to difference in the stature (height) of women belonging to different weight tertiles.**

- All the subjects having both weight during early second trimester of pregnancy (14-16weeks) and birth weights were taken together from all the three settings and were sorted according to maternal weight tertiles to see the effect of weight during pregnancy on the birth weight.
- The same procedure was repeated to see the effect of weight during late third trimester (>36weeks) on the birth weight.





- In 250 subjects weight at 14-16weeks and birth weights were available.
- In 362 subjects weight both at 36weeks and birth weights were available.
- There was a gradient in birthweight in relation to weight tertiles at second and third trimester .
- The difference in maternal weight and birthweight were due to differences in the height of women

Table no 4: Height of the subjects		
	Early second trimester group	Late third trimester group
First tertile	147.4±5.40(82)	149.8±5.24(119)
Second tertile	151.4±4.25(82)	151.6±4.86(120)
Third tertile	153.8±5.54(84)	153.9±5.05(123)

- Table no 4 shows that there is statistically significant (p values of student t-test are <0.05) difference in the maternal height in different tertiles.
- The differences in the second and third trimester weights and birth weights between weight tertiles is due to the difference in the stature (height) of the women belonging to different tertiles .

Data from other NFI studies show that the prevalence of under-nutrition(UN) in 18-29 years age is 12.1%, 54% are normally-nourished(NN) and 33.9% are over-nourished(ON).

It would therefore appear that UN i.e. wasting is no longer a major problem in the group of population investigated; but ON is seen in one third of the population.

An attempt was made to assess, what is the residual weight gain after pregnancy in community setting.

In 121 subjects pre-pregnancy and post-pregnancy weights were available.

Table No. 5: Difference in weight during pre and post pregnancy

	Pre pregnancy wt	Post pregnancy (3-6m) wt	pre-pregnancy BMI	post-pregnancy BMI
Mean	53.9±10.46	55.6±10.35	23.4±4.26	24.1±4.10
P value (paired T Test)	<0.05		<0.05	

Mean weight and BMI is shown in the table no 5. Mean height of these women was 151.9±5.28.

- There was a 1.7 kg increase in the post pregnancy weight.
- The increase in weight is statistically significant.
- More than one third of the subjects were overweight during both pre pregnancy (40%) and post pregnancy (45%); in contrast to only 9.1% and 5.8% underweight.

Data shows even with 8 kg pregnancy weight gain there is a residual weight gain of about 2 kg after pregnancy .

- **More than 90% women are normally-nourished or over-nourished they may not require food supplementation**
- **The observed differences in the pregnancy weight and birth weight are not related to weight but related to the maternal stature**
- **Food supplementation or increasing food intake to all women majority of whom are short statured can increase weight gain and render them at risk of overnutrition and associated health hazards**
- **In view of these, it might be preferable to screen and identify under-nourished (low BMI) women and provide continuous food supplementation to them throughout pregnancy and monitor the improvement in nutritional status .**

Thank You