

MATERNAL PREGESTATIONAL WEIGHT AND MULTIPLE PREGNANCY DURATION *

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Statistical studies have shown a significant correlation between maternal pregestational weight and duration of pregnancy (i.e., a low weight may cause a shortening of pregnancy). Duration of pregnancy is further correlated to the weight gain (i.e., it is shortened by an insufficient gain). This phenomenon is observed in thin women, but not in women of heavy weight before the pregnancy.

The studies of weight losses obtained through hypocaloric or sodium-free diets or diuretics, show that a sudden weight loss may cause a shortening of pregnancy duration. This is verified in patients with normal or insufficient weight gain and starting with a normal or small weight, but not in overweight patients or with an important weight gain.

This study demonstrates the dangers of excessive measures toward prevention of toxemia. The decision of compulsive weight loss in mothers with multiple pregnancy must be well thought and carefully applied, for excessive measures could reduce the duration of pregnancy and thus increase the risks of perinatal death.

We have studied 116 cases of multiple pregnancies, i.e., all the cases observed between 1966 and 1971 at the Hospital of Port-Royal. We have registered the normal pregestational weight, the weight gain at 28, 32, and 36 weeks of pregnancy, and the duration of pregnancy in weeks since the 1st day of the last menstruation.

We have also registered the height, the Ob-Gyn past history, the results of preceding pregnancies, weight, sex, monochorial or dichorial aspect of placenta, maneuvers, interventions or complications of delivery, etc. The study on the children will be published separately.

This paper is a study on the relations between pregestational weight, weight gain during pregnancy (especially at 28, 32, and 36 weeks), and duration of pregnancy.

We have made a statistical analysis of differences between premature (≤ 37 weeks) and at-term births (> 37 weeks), with studies of correlations and differences in distribution.

1. RELATION BETWEEN PREGESTATIONAL WEIGHT AND DURATION OF PREGNANCY

When all the patients are grouped, the relation between pregestational weight and duration of pregnancy ($r = 0.14$) is not statistically significant.

But on the contrary, if we separate the patients in two groups, those with a pregestational weight ≤ 68 kg and those with a pregestational weight > 68 kg, no premature multiple birth is found in the second group, whereas in the former there is a statistically significant relation between pregestational weight and duration of pregnancy. The patients of lesser weight deliver earlier.

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Duration of the twin pregnancy	Mother's pregestational weight		
	≤ 68 kg	> 68 kg	
> 37 weeks	41	7	<i>P</i> < 0.05
≤ 37 weeks	53	0	

2. INSUFFICIENT WEIGHT GAIN

When weight gain is studied, a criterion of insufficient weight gain should be defined as such: (1) < 6 kg at 28 weeks; (2) < 7 kg at 32 weeks; (3) < 8 kg at 36 weeks. When all the cases are grouped, there is no significant correlation between duration of pregnancy and insufficient weight gain.

Duration of the twin pregnancy	Mother's weight gain		
	Insufficient	Sufficient	
> 37 weeks	12	37	<i>ns</i>
≤ weeks	15	28	

But on the contrary, after division in two groups according to the pregestational weight, the notion of insufficient weight gain is important:

- In the women with a pregestational weight > 65 kg there is no relation between insufficient weight gain and shortening of pregnancy.
- In the women with a pregestational weight ≤ 65 kg there is a statistically significant difference: the patients with an insufficient weight gain have more premature infants (*r* = 0.39).

Duration of the twin pregnancy	Mother's pregestational weight		
	≤ 65 kg	> 65 kg	
> 37 weeks	7	5	<i>P</i> < 0.05
≤ 37 weeks	15	0	

3. WEIGHT LOSS DURING PREGNANCY

We have studied the cases of patients with a weight loss of at least 1 kg between the 28th and 32nd week and between the 32nd and 36th week. For all 26 cases the correlation is

statistically significant: the loss of more than 1 kg increases significantly the number of premature births ($r = 0.41$).

Furthermore, here too, pregestational weight is important. Weight loss has no effect in women with an initial weight ≥ 62 kg, whereas it causes a significant increase of premature births in women with an initial weight < 62 kg.

Duration of the twin pregnancy	Mother's pregestational weight		
	< 62 kg	≥ 62 kg	
> 37 weeks	6	7	$P < 0.05$
≤ 37 weeks	12	1	

4. MOMENT OF WEIGHT LOSS

Weight loss appears to be important in relation with term:

— Between 28 and 32 weeks the loss of 1 kg causes an increase of deliveries before 34 weeks, but this is not statistically significant.

Duration of the twin pregnancy	Mother's weight loss between 28 and 32 weeks		
	Yes	No	
> 34 weeks	11	45	<i>ns</i>
≤ 34 weeks	4	3	

— Between 32 and 36 weeks the loss of 1 kg significantly increases the number of premature births before 38 weeks ($P < 0.05$).

Duration of the twin pregnancy	Mother's weight loss between 32 and 36 weeks		
	Yes	No	
> 37 weeks	8	34	$P < 0.05$
≤ 37 weeks	9	7	

5. WEIGHT GAIN AND ZYGOSITY

Multiple births have been separated into three groups, so as to study the distribution of weight gain at 28 weeks of pregnancy according to zygosity:

1. MZ group, same sex, monoamniotic
2. DZ group, different sex, diamniotic
3. Undetermined group: all the others

The weight gain is shown to be different: 7.3 ± 1.7 kg in the MZ vs. 8.3 ± 1.5 kg in the DZ.

The general distribution of weight gain shows a bimodal curve profile, each peak corresponding to one of the two zygosity types.

DISCUSSION

The study of maternal weight and its variations is extremely important in order to establish adequate prenatal cares in pregnant women with twins, who admittedly have a higher weight gain.

From our present study we shall present two notions:

1. *A physiologic notion.* Weight gain depends upon the genetic type of multiple pregnancy. The MZ type presents, at 28 weeks of pregnancy, a definitely lesser weight gain than the DZ one. This could bring about a very interesting discussion, considering the smaller placentae, and the increase in hypotrophy (or retarded *in utero* growth) in MZ pregnancies.
2. *A clinical notion.* The supervision of weight gain is a prognostic factor in multiple pregnancy. An insufficient weight gain should be considered as a potential cause of premature birth, and therefore induce to establish adequate measures of prevention.

We have found no premature births in women weighing over 62 kg, as if this heavy initial weight could be a protection against the mechanism of prematurity.

We wish to stress the effect of an induced weight loss (either by strict diet or diuretics): between 32 and 36 weeks this weight loss is the cause of a definite increase in premature births.

Loss of weight in multiple pregnancy should therefore be considered as a factor of risk, and preventive measures should be established.