

## Artigo Original

**Gestational weight gain in triplet, trichorionic and triamniotic pregnancy:  
experience report with a case****Ganho de peso gestacional em gestação trigemelar, tricoriônica e triamniótica:  
relato de experiência com um caso**<http://dx.doi.org/10.18316/sdh.v11i1.9399>

Gabriella Pinto Belfort<sup>1,2\*</sup> ORCID 0000-0003-2066-7446, Roseli de Souza Santos da Costa<sup>1</sup> ORCID 0000-0001-5671-828X, Verônica de Oliveira Corrêa Rached<sup>1</sup> ORCID 0000-0003-1450-0308, Julyane de Oliveira Sobrinho<sup>1</sup> ORCID 0000-0001-5296-8580

**ABSTRACT**

**Introduction:** Inadequate weight gain during pregnancy is recognized as a risk factor for unfavorable maternal and perinatal outcomes, such as preeclampsia. Reports focusing on weight gain in triplet pregnancies are scarce in the literature. **Objective:** To achieve the evolution of gestational weight gain and the maternal and perinatal outcomes of a triple pregnancy case. **Description of case:** In the present case report, the case of a triplet, trichorionic and triamniotic pregnancy was presented. The patient in the case, 36 years old, started prenatal care at 12 weeks of gestation and pre gestational nutritional diagnosis of grade I obesity. The total gestational weight gain was 21 kg, agreed according to the current recommendation. The case presented gestational diabetes mellitus and preeclampsia. However, surgical delivery took place at 32 weeks and 6 days and the newborns had adequate weight for gestational age, without serious clinical complications. **Conclusions:** The observed results reinforce the importance of nutritional monitoring and the need for more studies that address weight gain in triplet pregnancy.

**Keywords:** Gestational weight gain; Pregnancy high risk; Pregnancy triplet; Prematurity.

1 National Institute of Woman, Child and Adolescent Health Fernandes Figueira (IFF/Fiocruz), Brazil.

2 Universidade Federal do Estado do Rio de Janeiro (UNIRIO).

\*Corresponding author: National Institute of Woman, Child and Adolescent Health Fernandes Figueira (IFF/Fiocruz). Av. Rui Barbosa, 716 - Flamengo, Rio de Janeiro, RJ, Brazil. Zip code: 22250-020. E-mail: [belfortgabriella@hotmail.com](mailto:belfortgabriella@hotmail.com)

## RESUMO

**Introdução:** O ganho de peso inadequado durante a gestação é reconhecido como fator de risco para desfechos maternos e perinatais desfavoráveis, como a pré-eclâmpsia. **Objetivos:** Descrever a evolução do ganho de peso gestacional e os resultados maternos e perinatais de um caso de gestação trigemelar. **Descrição do caso:** No presente relato de experiência foi apresentado o caso de uma gestação tripla, tricoriônica e triamniótica. A paciente do caso, de 36 anos, iniciou pré-natal com 12 semanas de gestação e diagnóstico nutricional pré-gestacional de obesidade grau I. O ganho ponderal gestacional total foi de 21kg, estando de acordo com a atual recomendação. O caso apresentou diabetes mellitus gestacional e pré-eclâmpsia. Mas, o parto cirúrgico ocorreu com 32 semanas e 6 dias e os recém-nascidos apresentaram peso adequado para idade gestacional, sem intercorrências clínicas graves. **Conclusões:** Os resultados observados reforçam a importância do acompanhamento nutricional e da necessidade de mais estudos que abordem o ganho de peso em gestação trigemelar.

**Palavras-chaves:** Gestação de trigêmeos; Ganho de peso na gestação; Gravidez de alto risco; Prematuridade.

## INTRODUCTION

The incidence of multiple pregnancies has increased in recent decades due to higher average maternal age and higher frequency of human reproduction treatments<sup>1</sup>. In Brazil, according to the Information System on Live Births - SINASC, in 2019, the number of triplet pregnancies or with the highest number of fetuses totaled 1,467 live births, and of these, 632 occurred in the Southeast region<sup>2</sup>.

The main causes of triple pregnancy are the use of fertility drugs, spontaneous and in vitro methods<sup>3</sup>. In addition, the mode of conception seems to contribute to pregnancy outcomes. In a study with 53 American women, it was shown that the mode of conception using assisted reproductive technology was associated with chorionicity, which, in turn, influenced the length of pregnancy and risk of neonatal mortality<sup>4</sup>.

Triplet pregnancies, by themselves, are more likely to develop hypertensive syndromes, such as preeclampsia (PE), gestational diabetes mellitus (GDM), prematurity, intrauterine growth restriction and other unfavorable outcomes for pregnant women, fetuses or newborns (NBs)<sup>1,3,5</sup>.

Weight gain during pregnancy, when elevated, is recognized as one of the factors that can contribute to the development of GDM. In triplet pregnancies, weight gain has been associated with fetal weight and gestational age at birth<sup>1,6,7</sup>. Weight gain, especially in the first and second trimesters of these pregnancies, has a significant impact on birth weight<sup>8</sup>.

Despite the higher incidence of these pregnancies, studies addressing weight gain during triplet pregnancy are still scarce in the literature. Therefore, this case report aims to describe the evolution of gestational weight gain and the maternal and perinatal outcomes of a case of triplet, trichorionic and triamniotic pregnancy.

## DESCRIPTION

Patient, A.C.S., 36 years old, black, pregnant with triplet, trichorionics and triamniotics reported having undergone fertility treatment using ovulation inducing medication. The patient in this case signed an informed consent form and her identity was preserved. A.C.S., was in her second pregnancy, and had a history of miscarriage. The patient has higher education, works as a teacher and had her activities interrupted due to the social isolation of the COVID-19 pandemic. This patient has hypothyroidism and

denied other diseases and that of her partner, in addition to reporting that she did not use tobacco, alcoholic beverages or illegal drugs.

A.C.S was assisted by the multidisciplinary team of prenatal care from the Fernandes Figueira National Institute of Women's, Child and Adolescent Health – IFF/Fiocruz. She received nutritional monitoring since the beginning of prenatal care, which was started at the above mentioned institution when the pregnant woman was at 12 weeks of gestation, according to ultrasound. During pregnancy, the patient developed genital herpes and developed GDM at 26 weeks' gestation.

During prenatal assistance (PA), the patient used acetylsalicylic acid - 100 mg/day for the prevention of preeclampsia, levothyroxine, acyclovir, ferrous sulfate, and prophylactic enoxaparin during hospitalization until delivery.

On completing 31 weeks and 5 days of gestational age, the patient presented high magnitude edema in the lower limbs. At this time, she was admitted for PE screening. Three days after admission to the A.C.S she was diagnosed with PE and remained hospitalized until the surgical delivery, which occurred at 32 weeks and six days. The patient had 08 consultations of PA, 06 prenatal nutritional assistance (PNA) consultations, in addition to periodic ultrasound exams, every 15 days, from the second gestational trimester.

### **Prenatal nutritional assistance**

A.C.S followed up with the nutritionist from the 12th to the 26th week of pregnancy and presented a pre gestational nutritional diagnosis of obesity (body mass index – BMI = 32 kg/m<sup>2</sup>), according to the reported pre-pregnancy weight (82 kg). In the first consultation, he complained of nausea, heartburn and symptoms of intestinal constipation, which were resolved during the PNA. Weight gain up to 12 weeks of gestation was 3.3 kg.

The assessment of weight (kilograms) and height (meters) was performed by the nutritionist and the classification of the pre-pregnancy nutritional status was performed according to the recommendations of the Institute of Medicine<sup>9</sup>.

Given the lack of consensus on adequate weight gain in triple pregnancies, data from scientific articles and the nutritional evolution of pregnant women and fetuses were considered for programming weight gain<sup>6,9,10</sup>. Table 1 shows the evolution of weight gain of A.C.S and scientific evidence on weight gain in triplet pregnancies according to available literature.

<b>Maternal characteristics</b>	<b>1st gestational trimester</b>	<b>2st gestational trimester</b>	<b>3st gestational trimester</b>
<b>Gestational weight gain (kg)</b>	3.85	13.6	3.55
<b>Weekly gestational weight gain (kg):</b>	0.28	0.97	0.71
<b>Total gestational weight gain (kg):</b>	-	-	21
<b><i>Scientific evidence on weight gain in triplets pregnancies.</i></b>			
<b>Total gestational weight gain – Luke et al. study<sup>10</sup> (kg):</b>	20.5±7.48 <sup>a</sup>		
<b>Weekly gestational weight gain up to 24th week – Luke et al. study<sup>10</sup> (kg):</b>	0.680 <sup>b</sup>		
<b>Weekly gestational weight gain by 24<sup>th</sup> week until delivery - Luke et al. study<sup>10</sup> (kg):</b>	0.798±0.485 <sup>c</sup>		
<b>Total gestational weight gain by IOM<sup>9</sup> (kg):</b>	20.5-23 <sup>d</sup>		

**Table 1.** Evolution of gestational weight gain of A.C.S and scientific evidence on weight gain in triplet pregnancies considered for the case.

Legend: IOM – Institute of Medicine.

Evidence for mean gestation time with no fetal or neonatal deaths: 32.9 (standard deviation = ± 3.0) weeks, express as mean and standard deviation in a.

Results expressed as mean for weight gain of 16.32 kg up to 24 gestational weeks in b.

Results express as mean and standard deviation in c.

Recommendation for gestation time between 32 and 34 weeks in d.

The total energy value of the diet (TEV) was initially calculated with the objective of promoting a gain of 680 grams/week (12 to 24 weeks of gestation) and a total weight gain of approximately 12 kg up to 24 weeks. By completing 26 weeks of gestation, the pregnant woman had achieved a gain of 14.8 kg. At this time, to reach the recommended total weight gain in this case, which would be 20.5 to 23 kg, the TEV was recalculated in order to promote the weekly weight gain of 816 grams, considering that the delivery could occur between 33 and 36 gestational weeks<sup>9,10</sup>.

At each appointment with the nutritionist, the evolution of fetal weights was evaluated, based on the *Intergrowth-21* fetal weight classification, for single fetus pregnancies, which is shown in table 2<sup>11</sup>.

**Table 2.** Evolution of fetal weight and weight-for-gestational age correlation throughout the triplet, trichorionic and triamniotic pregnancy and perinatal outcomes of the newborns (2020).

Gestational age (w)	Estimated fetal weight (g) and Weight for gestational age (percentiles) <sup>a</sup>										Perinatal outcomes (32 w+6 d)				
	14 <sup>th</sup>	16 <sup>th</sup>	18 <sup>th</sup>	20 <sup>th</sup>	22 <sup>th</sup>	24 <sup>th</sup>	26 <sup>th</sup>	28 <sup>th</sup>	30 <sup>th</sup>	32 <sup>th</sup>	Birth weight (g/percentiles)	L (cm)	HC (cm)	Apgar 1st min	Apgar 5st min
<b>Fetus 1</b>	120	178	273	391	566	813	1097	1413	1683	1962	1924	44	31	7	8
					p 50-90	> p 90	> p 90	> p 90	> p 90	p 50-90	p 50-90 <sup>b</sup>				
<b>Fetus 2</b>	109	177	272	400	563	844	983	1247	1587	1970	2052	42	31	7	8
					p 50-90	> p 90	> p 90	p 50-90	p 50-90	p 50-90	p 50-90 <sup>b</sup>				
<b>Fetus 3</b>	109	178	253	367	513	733	1119	1285	1629	1894	1735	42	30	6	8
					p10-50	p 50-90	> p 90	> p 90	p 50-90	p 50-90	p10-50 <sup>b</sup>				

Legend - g: grams; w: weeks; d: days; L: length; HC: head circumference; cm: centimeters; min: minute.

<sup>a</sup> Weight for gestational age correlation percentiles based on the Intergrowth-21 fetal weight curve.

<sup>b</sup> Weight for gestational age correlation percentiles based on the Intergrowth-21 birth weight curve.

When diagnosing GDM, the pregnant woman received nutritional guidelines for glycemic control. In this circumstance, the three fetuses were above their gestational age. A.C.S did not need to use insulin and maintained glycemic control through diet therapy.

On admission to hospital, she weighed 109 kg, with edema in the lower limbs, 4+ / 4 +, with a lock sign and difficulty to mobilize. By the time of delivery, the patient had reduced her weight by 6 kg, which was associated with a reduction in edema, which on the day of delivery was reported as 3+/4+ and still with a locker sign. The total weight gain presented before delivery was 21 kg. During hospitalization, the patient reported difficulty in eating, heartburn and received proper food for GDM. The patient remained hospitalized for 12 days until delivery and 4 days postpartum.

## Perinatal outcomes

Surgical delivery took place at 32 weeks and 6 days and the fetuses were all cephalic. The characteristics related to the fetuses/NBs are shown in table 2. The weight of the three placentas corresponded to 970 grams (placenta A: 320 grams; placenta B: 360 grams; placenta C: 290 grams) and the clamping of the umbilical cord was immediate.

Newborns 1 (female) and 2 (male) obtained Apgar 7 in the first minute and Apgar 8 in the 5th minute, while fetus 3 (female) obtained Apgar 6 in the 1st minute and 8 in the 5th minute of life.

Newborns 1 and 3 had hypotonia, mild respiratory distress, cyanosis at birth and received oxygenation only in the delivery room, via continuous positive airway pressure (CPAP). Both were referred to the Neonatal Intensive Care Unit (NICU) for suction training and weight gain. Newborn (NB) 3 also received tactile stimulation in the delivery room. NB 2, in addition to presenting hypotonia, cyanosis and respiratory distress, presented an irregular drive and required greater oxygen flow in the CPAP. None of the NBs needed to use parenteral nutrition.

All NBs remained hospitalized in the NICU for twenty-one days, were discharged from the hospital weighing 2102 grams (NB 1), 2338 grams (NB 2) and 2008 grams (NB 3), and with feeding based on breastfeeding associated with infant introducing formula.

This case report was approved by the IFF/Fiocruz Ethics and Research Committee (CAAE: 44374421.0.0000.5269).

## DISCUSSION

The main factors responsible for the higher incidence of twinning are assisted reproduction methods, such as ovarian stimulation and in vitro fertilization. In addition, with advancing age, the incidence of twin pregnancy increases and peaks around the fourth decade of life, when maximum stimulation of follicle-stimulating hormone increases the rate of multiple follicle development<sup>12</sup>. In fact, the patient reported having undergone fertility treatment using ovulation inducing medication and was 36 years old.

Regarding approaches to weight gain and nutritional evolution in triplet pregnancies, the literature is scarce and old. In order to safely carry out the PNA of this case, it was necessary that the consultations took place at short intervals. This made possible the constant assessment of gestational and fetal weight gain and the resolution of possible complications, which are common in multiple pregnancies<sup>1</sup>.

The patient in this case presented total gestational weight gain within the recommended by the Institute of Medicine (IOM), which recommends a weight gain between 20.5 kg and 23 kg for pregnancies up to 32-34 gestational weeks, regardless of the prenatal nutritional status gestational weight gain<sup>9</sup>. In other studies, with triple pregnancies, lower means of gestational weight gain were observed<sup>5,13</sup>. Eddib et al. observed that 46% of pregnant women with triplets presented total gestational weight gain below 19.8 kg. However, the authors emphasize that weight gain above 20.5 kg was associated with higher gestational age at delivery and higher birth weight<sup>7</sup>.

In the present case report, the weekly gestational weight gain varied a lot, being higher in the second trimester. This fact may be related to the macrosomia of the three fetuses in this period and the greater difficulty that the pregnant woman had to ingest adequate food portions during the third gestational trimester.

The patient in this study, up to the 24th gestational week, had an estimated weight gain of 13.56 kg, that is, below 16.3 kg, which, in the study by Luke et al. with pregnant women with triplets was associated with lower birth weight of NBs. The authors suggest that the rate of weight gain up to 24 weeks of gestation influences fetal growth and weight of newborns 3 to 5 times more than the weight gain after 24 weeks, in addition to indirectly influencing the length of gestation<sup>10</sup>.

However, the effect of weight gain up to 24 gestational weeks seems to be more significant for pregnant women with low weight or eutrophic, compared to those with overweight<sup>10</sup>. In the case reported, the pregnant woman had pre-gestational obesity, and this fact may have contributed so that the three NBs were born with an adequate weight for their gestational age.

The pregnant woman in the study presented PE and GDM. As already described, triplet gestation presents an increased risk for these complications<sup>1</sup>. The hypertensive syndrome in these pregnancies, in addition to causing maternal and fetal harm, often leads to elective anticipation of delivery<sup>14</sup>.

As can be seen in the study, the pregnant woman had no other clinical complications and the NBs had higher birth weight compared to what is shown in other studies with triplet pregnancies, which indicate a mean birth weight between 1.5 and 1.6 kg<sup>5,13</sup>.

Chorionicity is associated with gestational and perinatal outcomes during multiple pregnancies. Trichorionic triplets have a lower risk of complications such as fetal death, intrauterine growth restriction and prematurity compared to dichorionic triplets<sup>15</sup>. In a recent systematic review by Curado et al., it was

identified that the risk of neonatal death is 3.3 times higher between triples dichorionic and triamniotic pregnancies compared to trichorionic and triamniotic pregnancies<sup>15</sup>. Corroborating the literature, the case report in question refers to the pregnancy of triplet, trichorionic and triamniotic where it is observed that the fetuses did not present any clinical complications serious.

## CONCLUSION

The clinical case described, unlike others presented in the scientific literature, had a favorable outcome with the birth of three healthy NBs, despite the patient having developed PE and GDM.

Controlling weight gain is an essential factor for the proper course of pregnancy. Given the lack of studies on adequate weight gain in triplet pregnancies, it is necessary to carry out research addressing this issue in this population, so that it is possible to draw up a recommendation that considers the pre gestational nutritional status and that can be used safely.

## Authors' contributions

GPB: Conception of the study, writing and revision of the manuscript.

RSSC: Writing and revision of the manuscript.

VOCR: Writing and revision of the manuscript.

JOS: Writing and review of the manuscript.

## Conflict of interest

Authors declared no conflict of interest.

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